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Hellenic Psychiatric Association
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Tel.: (+30) 210-72 14 184, Fax: (+30) 210-72 42 032 • e-mail: psych@psych.gr

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Research article
Ερευνητική εργασία

The impact of unemployment on mental health examined in a community mental health unit during the recent financial crisis in Greece

G. Konstantakopoulos,[1,2] K. Pikouli,[1] D. Ploumpidis,[1] E. Bougonikolou,[1] K. Kouyanou,[1] M. Nystazaki,[3] M. Economou[1]

[1]Byron-Kessariani Community Mental Health Centre, First Department of Psychiatry, Athens University Medical School, Eginition Hospital, Athens, Greece,
[2]Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK,
[3]Department of Psychiatry, Athens University Medical School, General Oncology Hospital of Kifissia, Athens, Greece

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Financial crisis has significant impact on the mental health of the population, resulting in increasing incidence of mental disorders and suicides. Specific social and financial factors mediate the effects of financial crisis on mental health, such as poverty, financial difficulties and unemployment. During the recent international financial crisis, studies in many countries have shown that the worsening of various mental health indicators was related to financial difficulties and unemployment. In Greece, which is one of the countries that experienced intense and prolonged economic and social burden due to the recent crisis, the epidemiological findings were similar and the increase of the prevalence of major depression and suicide was excessive. However, the information about the mental health of the population deriving from health services is limited. The aim of this study was to investigate the impact of the crisis on community mental health –more specifically the rates of mental disorders and suicide, as well as the role of unemployment– among the new cases of a community mental health unit. The sample consisted of 1,865 adult users, men and women, who came seeking for help to the Byron-Kessariani Community Mental Health Centre (CMHC) during the years 2008–2013, i.e. the early years of the current crisis. Regarding the rates of the diagnostic categories in the new cases of CMHC per year, no significant differentiation was observed. There was an increase in the proportion of the unemployed individuals in the total sample of new cases during the study, from 9.65% in 2008 to 26.17% in 2013 and a significant association between unemployment and the occurrence of anxiety and depressive disorders, as indicated by the increase in the proportion of unemployed individuals among new cases with disorders of these categories. There was an upward trend in the rate of new patients referred to CMHC after a suicide attempt, which was doubled during the first years of the crisis. There was also an increase in the rate of unemployed individuals among these cases, from 10% in 2008 to 41.7% in 2009, reaching

the highest level in 2011 (53.3%). The findings of this study suggest that during economic crisis unemployment plays an important role in the development of anxiety and depressive disorders and is closely related to suicide attempts. Our results were derived from a specific catchment area and therefore they have high ecological validity.

Key words: Unemployment, financial crisis, anxiety disorders, depression, suicidality.

Introduction

A great number of previous studies have shown the significant impact of economic crises on the population mental health. Reviewing epidemiological studies carried out during major financial crises, such as the depression of 1929, the economic collapse of the former Soviet countries in the early 1990's and the Asian financial crisis at the end of the 20th century, a general and extensive increase in the prevalence of mental disorders and suicides during the economic crisis is apparent.[1–3]

The impact of economic crisis on population mental health is mediated by specific socio-economic factors, such as poverty, financial hardship and unemployment.[3] The effects of these factors on mental health have also been demonstrated by longitudinal studies concerning the economic cycle, regardless the occurrence of major economic crises. For instance, the important relationship between the fluctuation of unemployment and suicide rates was revealed by Stuckler et al, in 26 countries of Europe during the period 1970–2006.[4] Meta-analyses have also confirmed that people experiencing unemployment are at greater risk for mental health problems than the general population.[5,6] During a crisis, many economic and social conditions which are considered to be aggravating factors for mental health are present. Moreover, there are vicious circles of poverty and unemployment on the one hand and mental disorders on the other.[3] Therefore, during the recent crisis the World Health Organization has repeatedly warned against the prospect of an increase in the prevalence of mental disorders and suicides, while pointing out that the poor and financially vulnerable will be the first to suffer.[7] Indeed, studies in various countries during the recent crisis showed worsening of population mental health associated with economic distress and unemployment.[8]

In the recent international financial crisis, one of the most serious in modern history, Greece has been one of the countries that experienced a very intense and prolonged economic and social burden. Respectively strong negative effects on the mental health of the Greek population were, therefore, expected to be observed. The increase in the prevalence of depression is one of the most frequent and important effects of the financial crisis on the public health, as having repeatedly been found in the past.[2,3,8] From epidemiological data, it has been found that depression is associated strongly with low income, unemployment, as well as with job insecurity and debt.[9] During the current crisis in our country, a series of repetitive epidemiological studies conducted by the University Research Institute for Mental Health (URIMH), reflected changes in the prevalence of major depression, generalized anxiety disorder and suicide, as well as their correlation with economic indicators. The first study was conducted in 2008 through telephone interviews across a nationwide sample of population and was repeated with identical methodology in 2009, 2011 and 2013 (see review[9]). The findings of these studies have demonstrated a continuous and great increase in the prevalence of major depression from 3.3% in 2008, when the crisis was not yet manifest, to 6.8% in just one year, and further increase to 8.2% in 2011 and 12.3% in 2013.[10–12] In addition, these studies highlighted the relationship between the prevalence of major depression and severe economic distress and unemployment, especially the long-term unemployment.[9]

Time-series analyses during the recent economic crisis in many European countries and America has confirmed the general trend of increase in the number of suicides and the aggravating role of income reduction and unemployment.[13] These findings are in line with the findings considering both the

Russian crisis of the early 1990's and the Asian crisis of 1997–1998.[13,14] In particular, the impact of unemployment on suicide rates in times of financial crisis has been extensively studied in the international literature.[15] In the current crisis, it was specifically found that in every percentage point of increase in unemployment there was an increase in suicide by 0.79% in Europe and 0.99% in the USA.[16] Studies in Greece showed an increase in the total number of suicides in the early years of the economic crisis between 2008 and 2011,[17,18] and a significant increase in prevalence in reported suicide attempts and suicidal ideation during the same period.[10,19,20] More specifically, in Greece the number of suicide deaths increased by 55.8% in 2007–2011, although the total mortality rate increased by only 1.1%[21] in the same period. Concerning the impact of financial conditions on suicide, correlations of changes in suicide rate with the unemployment rate and the amount of the public debt were found[21] during the same period. A significant impact of unemployment, economic distress and low educational level on suicidal ideation and suicide attempts was also detected by a country-wide epidemiological study in 2013.[12]

Changes in mental health during economic recession have little been studied from the standpoint of mental health services, namely from data concerning the needs of people seeking help from these services. Novel evidence from the recent crisis in Greece indicate deterioration in quality of care by serious shortages of medical staff and burnout among health workers.[22] However, during this crisis data from mental health services has been scarcely studied, such as the number of hospitalized patients or visits to the emergencies of psychiatric hospitals[23] and the number of people who attempted suicide and reached for the emergencies[24] or were hospitalized.[25] To date there is no study with data from community mental health services that can reflect trends and changes in mental health within the community. The aim of this study was to investigate changes in mental health of the community and the impact of unemployment on it during the early years of the Greek financial crisis. In particular, the mental disorders diagnosed, the suicide attempts and the relationship of these clinical characteristics with the unemployment during the first years of the crisis (2008–2013) were investigated among the new cases of a community service with a certain catchment area within Athens (Byron and Kessariani).

Material and method

Population - Collection of data

The study data was obtained from the Byron-Kessariani Community Mental Health Centre (CMHC), by recording information about the adults who first visited the centre during the years 2008–2013. The data of these newcomers were retrieved from their CMHC files at intake. The data collection was carried out through a specially structured questionnaire which included: (a) basic demographics, (b) data on employment and insurance status, (c) data of previous history and hospitalizations, (d) diagnostic category of the applicant's mental health problems according to DSM-IV criteria, (e) type of help offered by the centre. For the purposes of this study, data on unemployment were used in combination with data on diagnosis and previous suicide attempt.

Statistical analysis

The IBM SPSS Statistics version 22 for Windows software was used to analyze the data. 2008 was considered the baseline year because it is the year just before the beginning of the current financial crisis. For the comparison of the frequencies between each year and the baseline, the Odds Ratios (OR) were calculated and evaluated by the z test as for their statistical significance. The relationship between diagnoses and previous suicide attempts and unemployment was examined with the x^2 test. For all tests the level of statistical significance was set to $p<0.05$.

Results

Sample characteristics

The total population of the study was 1,865 adults (ranging from 227 to 360 individuals per year). In terms of gender, the percentage of women ranged from 65.9% (in 2008) to 71.9% (in 2013). The mean age of the new cases each year ranged from 43.9 to 46.4 years, and the mean of the years of education ranged from 10.9 to 11.4. The sample differences among the study years in gender, age and years of education were not statistically significant. Table 1

Table 1. Diagnosis and suicide attempts at intake during the first years of the financial crisis.

	2008		2009		2010		2011		2012		2013	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
No of cases	360	–	356	–	299	–	321	–	227	–	302	–
Diagnosis												
Psychotic disorders	24	6.8	15	4.4	19	6.6	27	8.5	8	3.5	23	7.8
Bipolar disorder	13	3.7	18	5.2	12	4.1	15	4.7	11	4.9	15	5.1
Anxiety disorders	63	17.9	63	18.4	61	21.0	64	20.2	41	18.1	58	19.7
Depressive disorders	83	23.6	81	23.6	66	22.8	74	23.3	56	24.8	65	22.0
Substance use disorders	5	1.4	5	1.5	5	1.7	8	2.5	1	0.4	9	3.1
Personality disorders	8	2.3	6	1.7	5	1.7	2	0.6	8	3.5	0	0.0
Dementia	11	3.1	10	2.9	10	3.4	12	3.8	12	5.3	12	4.1
Other	144	41.0	145	42.3	113	39.0	115	36.3	89	39.4	109	36.9
Suicide attempt	10	2.9	12	3.5	16	5.5	15	4.7	13	5.8	7	2.4

shows the number of new cases per year, the number and frequency of diagnosis falling into the main diagnostic categories and the number and frequency of patients referred to CMHC after a suicide attempt. Differences in the rates of diagnostic categories per year were not statistically significant, as well as the rates of patients admitted after a suicide attempt (x^2=7.32, p=0.198). However, regarding to the latter, it has to be taken into account that the number of these cases was small, and differences cannot reach statistical significance, although they are large in terms of effect size (from 2.9% in 2008 to 5.8% in 2012, the highest). Finally, a large number of newcomers each year was classified as diagnostic category "other" because this category includes cases with interpersonal relationship problems or subclinical mental symptoms and requests for medical certificates.

Rate of unemployed individuals among the new cases

A strong increasing trend was found in the rates of the unemployed individuals among the cases seeking assistance in the centre for the first time, which is shown in figure 1. This increase was statistically significant (x^2=37.66, p<0.001). In particular, the rate increase was significant between 2008 and 2009 (OR=1.84, p=0.009) and another significant increase occurred from 2009 to 2010 (OR=1.52, p=0.036). Moreover, the rate of the unemployed individuals among the new cases increased further during 2012 and 2013.

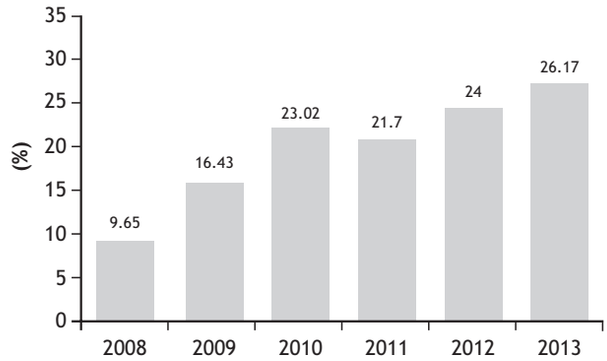

Figure 1. Unemployment rate in new clients of the Byron-Kessariani Mental Health Centre during the first years of the recent financial crisis.

Relationship between unemployment and clinical features in the new clients of CMHC

Examining the diagnostic categories, it was found that the proportion of the unemployed individuals increased among the patients with anxiety and depressive disorders during the study period (x^2= 20.27, p<0.001 and x^2=19.74, p<0.001, respectively). These rates per year are shown in the graphs of figures 2 and 3. In no other diagnostic category (such as psychotic disorders, bipolar disorder, substance abuse disorders, personality disorders, etc.) significant differences in unemployment rates were observed. Compared to the baseline year, the rate of unemployed individuals among patients with anxiety disorders was significantly increased in 2010 (OR=3.89, p=0.014), 2011 (OR=3.19, p=0.037), 2012 (OR=6.58, p<0.001), and 2013 (OR=7.49, p<0.001). Among new patients with depressive disorders, the rate of the unemployed individuals increased significantly compared to the baseline year in 2010 (OR=2.86, p=0.026), 2012 (OR=4.14, p=0.002), and 2013 (OR=4.58, p<0.001).

As shown in table 1, during the study years, the new clients with an anxiety disorder varied from 41 to 68 per year and their rates in the total number of new cases in each year ranged from 18.1% to 20.2%. The new clients with a depressive disorder varied from 56 to 83 per year and their rates in the total number of new cases in each year ranged from 22.0% to 24.8%. It is apparent that these are the two most common diagnostic categories, which, in total, account for the diagnosis of about one-half of the newcomers to the CMHC. However, no statistically significant difference in the rates of the diagnostic categories was found in the total sample.

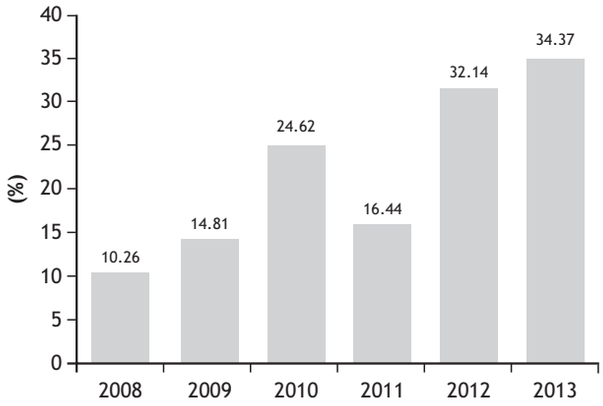

Figure 3. Unemployment rate in new patients with depressive disorders.

The proportion of the unemployed individuals among the patients referred to CMHC after a suicide attempt increased significantly after the onset of the economic crisis in comparison to the baseline year, as shown in figure 4. However, due to the relatively small sample size, this difference was not statistically significant (x^2=5.57, p=0.350), except for the year 2011 compared to baseline (OR=19.29, p=0.047). However, the effect size of the increase was already large since 2009 compared to 2008 (41.67% from 10%). The new patients admitted after a suicide attempt showed an increase, both in absolute numbers and as a proportion of all the new cases, from 2008 to 2010, but this was not statisti-

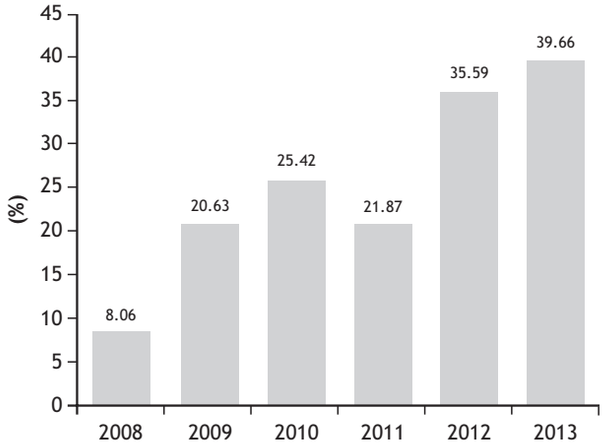

Figure 2. Unemployment rate in new patients with anxiety disorders.

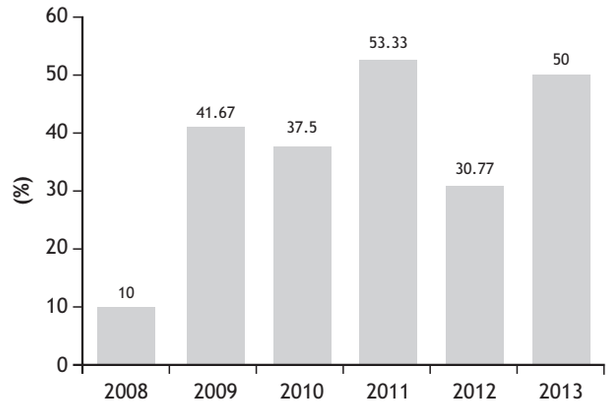

Figure 4. Unemployment rate in new patients after a suicide attempt.

cally significant due to the small sample size (table 1). Similarly, this rate further increased in 2012, and another but slight increase was observed in 2013.

Discussion

Our findings confirmed that there was an increase in the proportion of the unemployed individuals in the new cases during the study years, from 9.65% in 2008 to 26.17% in 2013. The upward trend was continuous; yet, statistically significant increase was observed only in 2009 and 2010. Despite this trend, the rate of the unemployed individuals among the new cases is not significantly different from the increase in the unemployment rate in the general population in Greece over the same period, i.e. from 7.8% at the beginning of 2008 to 27.5% at the end of 2013.[26] Accordingly, there was not prima facie increase in mental morbidity among the unemployed individuals, because in this case their rate in the new cases should well exceed the overall unemployment rate in the population. However, it should be taken into account that a number of reasons may prevent the unemployed individuals who experience psychological problems for the first time, from seeking help at mental health services, such as stigmatization, ignorance of the help they can receive, and insurance or financial problems that may prevent them from doing so. In addition, the unemployment rates in the new cases would have to be compared with the unemployment rates in the population of the catchment area of the CMHC, but we do not obtain relevant data. Therefore, the number of unemployed individuals seeking for help might be found significantly increased if the unemployment rates in the catchment area were lower than the national rates, which is likely since this area (Byron and Kessariani) is one of the middle-class regions of Athens.

Regarding the frequency of the diagnostic categories in the new cases in CMHC per year, there was no significant increase in the frequency of anxiety and affective disorders. According to the relevant literature, an increase in anxiety and depressive disorders, mostly related to unemployment, job insecurity as well as social exclusion, are usually present in every crisis.[3] Especially during the current economic crisis in Greece, a great increase in the prevalence of major depression was found.[10–12,27] On the contrary, the only data available on anxiety disorders is that the prevalence of generalized anxiety disorder between 2009 and 2011 did not show any statistically significant difference.[27] However, there are a number of reasons why this trend in the prevalence of depression may not be reflected in the new referrals to the CMHC, and other community units as well. First, those identified to meet the criteria of a disorder in epidemiological studies do not necessarily seek help in mental health units. A large number of people suffering from common mental disorders, i.e. anxiety and depressive disorders, never turn to specialists for help, and they often find it difficult to report their psychiatric symptoms to primary health care physicians.[28] Second, it is likely that many of the individuals experiencing depression for the first time amidst economic crisis, will not seek assistance in mental health services due to other barriers, such as lack of insurance cover or inadequate information on help offered by public services, or aggravation of the stigma for the mental illness that may exist in these periods. Finally, due to the high workload of the public services, it is expected that part of the growing needs for mental health care will be covered by the private sector (psychiatrists and psychologists), which is easily accessible and affordable for a large part of the population in our country.

The main finding of the present study was the significant association of unemployment with the occurrence of anxiety and depressive disorders during the economic crisis, as indicated by the increase in the rate of the unemployed individual in the new cases diagnosed with disorders of these categories.

An important relationship between unemployment and the prevalence of depression in our country during the same crisis period was also found in epidemiological studies. More specifically, there was a significant correlation of unemployment with the rise in depression prevalence between 2008 and 2009,[10] which was not found between 2008 and 2011,[11] apparently because the increase in the prevalence of major depression between 2009 and 2011 was significant in both the unemployed and the economically active population.[27] However, in a simi-

lar epidemiological study in 2013, the unemployed people were found to have increased prevalence of major depression by 58% and 53%, compared to the economically active and economically inactive population, respectively.[12] This relationship may explain the fact that in this study, men of working age showed significantly greater prevalence of major depression than women, unlike the usual epidemiology of the disorder.[12] In our study, a significantly stronger association between unemployment and depressive disorder compared to 2008 occurred in the years 2010, 2012 and 2013. Our findings are therefore consistent with those of the aforementioned epidemiological surveys, because the increased rates of depression among the unemployed people in the general population is expected to lead to a higher number of unemployed individuals seeking treatment for depression in community mental health services.

Regarding the relationship of unemployment with the prevalence of anxiety disorders in our country during the crisis period, the data from epidemiological studies is scarce. The only relevant finding is that, unlike major depression, no significant increase was found in the rate of generalized anxiety disorder among the unemployed between 2009 and 2011, while an increase was found in the economically active and inactive population over the same period.[27] On the contrary, in our study, a significantly stronger association between unemployment and anxiety disorders, compared to 2008, occurred in the years 2010, 2011, 2012 and 2013. The fact that our study concerns a population coming to help rather than trends in the general population should certainly be considered.

There was a clear upward trend in the number of new patients who had attempted suicide, which even reached the doubling of their rate among new cases during the first years of the crisis. This trend was not found to be statistically significant, but this is due to methodological inability to detect differences in relatively small rates in our sample size (statistical error type I). The tendency of increase in the rate of suicide attempts is in line with data from the general population in Greece showing an increase in the total suicide rate during the first years of the economic crisis (2008–2011),[17,18] and particularly consistent with the findings from other studies similarly demonstrating a significant increase in the prevalence in reported suicide attempts and suicidal ideation in Greece during the same period.[10,19,20] An increase in admissions at mental health services following an attempted suicide was also reported in the study by Stavrianakos et al[25] in patients admitted at a general hospital of Athens.

On the other hand, in our study the increasing trend in attempted suicides appears to be decelerating in the final year of the study (2013). This finding is in line with the epidemiological data for 2013, showing a decline in suicidality, almost reaching the pre-crisis levels, with the monthly suicidal ideation rate falling to 2.6% and the monthly rate of suicide attempts to 0.9%.[12,29] This trend has to be confirmed by epidemiological data and data collected from the CMHC within the next years. In this case, it appears that suicides are likely to increase while the population is adjusting to new conditions during the early years the economic crisis, but not when the problems of the crisis become permanent. Data for deaths due to suicide in 2013 and the following years indicate that there is no further increase in suicide rates. However, the increase observed in the early years of the crisis does not appear to have been a random fluctuation. Time-series analysis of long periods, before and after the crisis, have confirmed that this increase was not accidental and was related to the current crisis[30] as well as to the increased unemployment and the austerity measures.[31,32]

Of particular importance are our results on the relationship between unemployment and suicide attempts. The rate of the unemployed individuals among the patients referred to CMHC following a suicide attempt increased significantly from 2008 to 2009 (from 10% to 41.7%) and reached the highest level in 2011 (53.3%). Because of the relatively small sample size, only the difference between 2011 and 2008 was statistically significant, but the effect sizes observed indicate the importance of the increase. We could assume the possible contribution of unemployment to suicide attempts during the economic crisis to the extent that a great number of them can be attributed to conditions related to unemployment. This finding, which is crucial for the preven-

tion of suicide during periods of economic recession, agrees with epidemiological data of the same period. Specifically, significant correlation of unemployment with the increase in suicide attempts was also found in epidemiological studies between 2008, 2009, 2011 and 2013.[10,19,33] Moreover, a significant association between unemployment and suicide attempts was found in patients admitted at a general hospital of Athens between 2007 and 2011.[25]

In conclusion, data from CMHC new referrals indicate that unemployment contributes to a significant extent to anxiety and depressive disorders and is strongly associated to suicide attempts during the financial crisis. Although similar findings have been obtained from previous epidemiological studies, the present study is the first to confirm the effects of unemployment on the population treated in a community mental health service in a specific catchment area. Thus, our findings have a specific ecological validity regarding populations in clinical context. In this respect, it would be important to extend our study including the years that followed, in order to investigate the long-term impact of the crisis and of the steadily high unemployment rate on mental disorders and suicide.

Η επίδραση της ανεργίας στην ψυχική υγεία μέσα από μία κοινοτική μονάδα ψυχικής υγείας κατά τη διάρκεια της πρόσφατης οικονομικής κρίσης στην Ελλάδα

Γ. Κωνσταντακόπουλος,[1,2] Κ. Πικούλη,[1] Δ. Πλουμπίδης,[1] Ε. Μπουγιονικολού,[1] Κ. Κουγιανού,[1] Μ. Νυσταζακή,[3] Μ. Οικονόμου[1]

[1]Κέντρο Κοινοτικής Ψυχικής Υγιεινής Βύρωνα - Καισαριανής, Α΄ Ψυχιατρική Κλινική, Ιατρική Σχολή Πανεπιστημίου Αθηνών, Αιγινήτειο Νοσοκομείο, Αθήνα,
[2]Department of Psychosis Studies, Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK,
[3]Πανεπιστημιακή Ψυχιατρική Κλινική, Ιατρική Σχολή Πανεπιστημίου Αθηνών, Γενικό Ογκολογικό Νοσοκομείο Κηφισιάς, Αθήνα

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Οι οικονομικές κρίσεις έχουν σημαντικό αντίκτυπο στην ψυχική υγεία του πληθυσμού με αποτέλεσμα τη μεγάλη αύξηση στη συχνότητα των ψυχικών διαταραχών και των αυτοκτονιών. Σε αυτές τις επιδράσεις της κρίσης διαμεσολαβούν συγκεκριμένοι κοινωνικο-οικονομικοί παράγοντες, όπως η φτώχεια, η οικονομική δυσχέρεια και η ανεργία. Κατά την πρόσφατη διεθνή οικονομική κρίση οι μελέτες σε διάφορες χώρες έδειξαν επιδείνωση ποικίλων δεικτών ψυχικής υγείας, που σχετίζεται με την οικονομική δυσπραγία και την ανεργία. Παρόμοια ήταν τα ευρήματα στην Ελλάδα, που είναι μία από τις χώρες με πολύ έντονη, βαθιά και παρατεταμένη επιβάρυνση από την πρόσφατη κρίση, με προεξάρχοντα χαρακτηριστικά την αύξηση του επιπολασμού της μείζονος κατάθλιψης και της αυτοκτονικότητας. Ωστόσο, ελάχιστα είναι τα δεδομένα για την ψυχική υγεία του πληθυσμού μέσα από τις υπηρεσίες υγείας. Η παρούσα μελέτη είχε στόχο να διερευνήσει την επίδραση της κρίσης στην ψυχική υγεία της κοινότητας, πιο συγκεκριμένα στη συχνότητα των ψυχικών διαταραχών και στην αυτοκτονικότητα, καθώς και τον ρόλο της ανεργίας μέσα από τα νεο-εισερχόμενα περιστατικά μιας κοινοτικής υπηρεσίας ψυχικής υγείας. Το δείγμα αποτελείτο από 1.865 ενηλίκους χρήστες, άνδρες και γυναίκες, που προσήλθαν αναζητώντας βοήθεια στο Κέντρο Κοινοτικής Ψυχικής Υγιεινής (ΚΚΨΥ) Βύρωνα-Καισαριανής κατά τη διάρκεια των ετών

2008–2013, δηλαδή τα πρώτα χρόνια της τρέχουσας κρίσης. Όσον αφορά στη συχνότητα των διαγνωστικών κατηγοριών στα νεο-εισερχόμενα περιστατικά στο ΚΚΨΥ ανά έτος, δεν παρατηρήθηκε σημαντική διαφοροποίηση αύξηση στη συχνότητα των διαταραχών. Βρέθηκε αύξηση του ποσοστού των ανέργων στο σύνολο των νεο-εισερχόμενων περιστατικών κατά τη διάρκεια της μελέτης, από 9,65% το 2008 σε 26,17% το 2013 και σημαντική συσχέτιση της ανεργίας με την εκδήλωση αγχωδών και καταθλιπτικών διαταραχών, όπως συνάγεται από την αύξηση του ποσοστού των ανέργων εντός των νεο-εισερχομένων περιστατικών με διαταραχές αυτών των κατηγοριών. Βρέθηκε μια σαφώς ανοδική τάση στη συχνότητα των ατόμων που είχαν αποπειραθεί να αυτοκτονήσουν, η οποία έφτασε μέχρι και στον διπλασιασμό του ποσοστού τους μεταξύ των νέων περιστατικών κατά τα πρώτα χρόνια της κρίσης. Παρατηρήθηκε επίσης αύξηση του ποσοστού των ανέργων ανάμεσα σε αυτά περιστατικά, ήδη από το 2008 στο 2009 (από 10% σε 41,7%), που έφτασε στο ανώτερο επίπεδο το 2011 (53,3%). Τα ευρήματα της παρούσας έρευνας υποστηρίζουν ότι σε περιόδους οικονομικής κρίσης η ανεργία διαδραματίζει σημαντικό ρόλο στην εκδήλωση αγχωδών και καταθλιπτικών διαταραχών και σχετίζεται στενά με τις απόπειρες αυτοκτονίας. Τα ευρήματά μας προκύπτουν μέσα από τον πληθυσμό εξυπηρετούμενων από μια κοινοτική δομή σε συγκεκριμένη περιοχή αναφοράς και γι' αυτό έχουν ιδιαίτερη οικολογική εγκυρότητα.

Λέξεις ευρετηρίου: Ανεργία, οικονομική κρίση, αγχώδεις διαταραχές, κατάθλιψη, αυτοκτονικότητα.

References

1. Marmot MG, Bell R. How will the financial crisis affect health? *BMJ* 2009, 338:b1314, doi: 10.1136/bmj.b1314
2. Uutela A. Economic crisis and mental health. *Curr Opin Psychiatry* 2010, 23:127–130, doi: 10.1097/YCO.0b013e328336657d
3. Giotakos O. Financial crisis and mental health. *Psychiatriki* 2010, 21:195–204, PMID: 21914618 (in Greek)
4. Stuckler D, Basu S, Suhrcke M, Coutts A, McKee M. The public health effect of economic crisis and alternative policy responses in Europe: an empirical analysis. *Lancet* 2009, 374:315–323, doi: 10.1016/S0140-6736(09)61124-7
5. McKee-Ryan F, Song Z, Wanberg CR, Kinicki AJ. Psychological and physical well-being during unemployment: a meta-analytic study. *J Appl Psychol* 2005, 90:53–76, doi: 10.1037/0021-9010.90.1.53
6. Paul K, Moser K. Unemployment impairs mental health: meta-analyses. *J Vocat Behav* 2009, 74:264–282, doi.org/10.1016/j.jvb.2009.01.001
7. World Health Organization Regional Committee for Europe (2013) Outcome document for the high-level meeting on Health systems in times of global economic crisis: an update of the situation in the WHO European Region. WHO Regional Office for Europe: Geneva. Available at: http://www.euro.who.int/__data/assets/pdf_file/0009/196209/63wd13e_OsloHealthSystemCrisis-2.pdf (Accessed 7 November 2013)
8. Parmar D, Stavropoulou C, Ioannidis JPA. Health outcomes during the 2008 financial crisis in Europe: systematic literature review *BMJ* 2016, 354:i4588, doi:10.1136/bmj.i4588
9. Economou M, Charitsi M, Peppou LE, Dieti E, Souliotis K. Mental health in Greece during the economic crisis: socio-economic determinants of depression. *Arch Hellen Med* 2018, 35(Suppl 1):17–26 (in Greek)
10. Madianos M, Economou M, Alexiou T, Stefanis C. Depression and economic hardship across Greece in 2008 and 2009: two cross-sectional surveys nationwide. *Soc Psychiatry Psychiatr Epidemiol* 2011, 46:943–952, doi: 10.1007/s00127-010-0265-4
11. Economou M, Madianos M, Peppou LE, Patelakis A, Stefanis CN. Major depression in the Era of economic crisis: A replication of a cross-sectional study across Greece. *J Affect Disord* 2013, 145:308-314, doi: 10.1016/j.jad.2012.08.008
12. Economou M, Angelopoulos E, Peppou LE, Souliotis K, Tzavara C et al. Enduring financial crisis in Greece: prevalence and correlates of major depression and suicidality. *Soc Psychiatry Psychiatr Epidemiol* 2016, 51:1015–1024, doi: 10.1007/s00127-016-1238-z
13. Chang S-S, Stuckler D, Yip P, Gunnell D. Impact of 2008 global economic crisis on suicide: time trend study in 54 countries. *BMJ* 2013, 347:f5239, doi:10.1136/bmj.f5239
14. Chang S, Gunnell D, Sterne J, Lu TH, Cheng AT. Was the economic crisis 1997-1998 responsible for rising suicide rates in East/Southeast Asia? A time-trend analysis for Japan, Hong Kong, South Korea, Taiwan, Singapore and Thailand. *Soc Sci Med* 2009, 68:1322–1331, doi:10.1016/j.socscimed.2009.01.010
15. Gunnell D, Platt S, Hawton K. The economic crisis and suicide. *BMJ* 2009, 338:1456–1457, doi: 10.1136/bmj.b1891
16. Reeves A, Stuckler D, McKee M, Gunnell D, Chang SS, Basu S. Increase in state suicide rates in the USA during economic recession. *Lancet* 2012, 380:1813–1814, doi: 10.1016/S0140-6736 (12)61910-2
17. Kontaxakis B, Papaslanis T, Havaki-Kontaxaki M, Tsouvelas G, Giotakos O, Papadimitriou G. Suicide in Greece: 2001–2011. *Psychiatriki* 2013, 24:170–174, PMID: 24185083
18. Fountoulakis KN, Koupidis SA, Grammatikopoulos IA, Theodorakis PN. First reliable data suggest a possible increase in suicides in Greece. *BMJ* 2013, 347, f4900, doi: 10.1136/bmj.f4900

19. Economou M, Madianos M, Theleritis C, Peppou LE, Stefanis CN. Increased suicidality amid economic crisis in Greece. *Lancet* 2011, 378:1459, doi: 10.1016/S0140-6736(11)61638-3
20. Economou M, Madianos M, Peppou LE, Theleritis C, Patelakis A, Stefanis C. Suicidal ideation and reported suicide attempts in Greece during the economic crisis. *World Psychiatry* 2013, 12:53–59, doi: 10.1002/wps.20016
21. Madianos MG, Alexiou T, Patelakis A, Economou M. Suicide, unemployment and other socio-economic factors: evidence from the economic crisis in Greece. *Eur J Psychiatry* 2014, 28:39–49, doi:10.4321/S0213-61632014000100004
22. Laliotis I, Ioannidis JPA, Stavropoulou C. Total and cause-specific mortality before compared with after the onset of the Greek economic crisis: an interrupted time-series analysis. *Lanc Publ Hlth* 2016, 1:e56–e65, doi: 10.1016/S2468-2667(16)30018-4
23. Giotakos O, Karabelas D, Kafkas A. [Financial crisis and mental health in Greece]. *Psychiatriki* 2011, 22:109–119, PMID: 21888184 (in Greek)
24. Fountoulakis KN, Savopoulos C, Apostolopoulou M, Dampali R, Zaggelidou E, Karlafti E et al. Rate of suicide and suicide attempts and their relationship to unemployment in Thessaloniki Greece (2000–2012). *J Affect Disord* 2015, 174:131–136, doi: 10.1016/j.jad.2014.11.047
25. Stavrianakos K, Kontaxakis V, Moussas G, Paplos K, Papaslanis T, Havaki-Kontaxaki B et al. Attempted suicide during the financial crisis in Athens. *Psychiatriki* 2014, 25:104–110, PMID: 25035179 (in Greek)
26. Hellenic Statistical Authority (ELSTAT). Labour force (Monthly data). Available from: http://www.statistics.gr/en/statistics/-/publication/SJO02/-(Accessed 6 August 2018)
27. Economou M, Peppou L, Fousketaki S, Theleritis Ch, Patelakis A, Alexiou T et al. Economic crisis and mental health: Effects on the prevalence of common mental disorders. *Psychiatriki* 2013, 24:247–261, PMID: 24486974 (in Greek)
28. Robinson JW, Roter DL. Psychosocial problem disclosure by primary care patients. *Soc Sci Med* 1999, 48:1353–1362, PMID: 10369436
29. Economou M, Angelopoulos E, Peppou LE, Souliotis K, Stefanis C.C. Suicidal ideation and suicide attempts in Greece during the economic crisis: an update. *World Psychiatry* 2015, 15:83–84, doi: 10.1002/wps.20296
30. Papaslanis T, Kontaxakis V, Christodoulou C, Konstantakopoulos G, Kontaxaki MI, Papadimitriou GN. Suicide in Greece 1992–2012: A time-series analysis. *Int J Soc Psychiatry* 2016, 62:471–476, doi: 10.1177/0020764016647753
31. Rachiotis G, Stuckler D, McKee M, Hadjichristodoulou C. What has happened to suicides during the Greek economic crisis? Findings from an ecological study of suicides and their determinants (2003–2012). *BMJ Open* 2015, 5:e007295, doi: 10.1136/bmjopen-2014-007295
32. Branas CC, Kastanaki AE, Michalodimitrakis M, Tzougas J, Kranioti EF, Theodorakis PN, et al. The impact of economic austerity and prosperity events on suicide in Greece: a 30-year interrupted time-series analysis. *BMJ Open* 2015, 5:e005619, doi: 10.1136/bmjopen-2014-005619
33. Economou M, Angelopoulos E, Peppou LE, Souliotis K, Stefanis C. Major depression amid financial crisis in Greece: Will unemployment narrow existing gender differences in the prevalence of the disorder in Greece? *Psychiatry Res* 2016, 242:260–261, doi: 10.1016/j.psychres.2016.05.041

Corresponding author: G. Konstantakopoulos, Byron, Kessariani Community Mental Health Center, 1st Department of Psychiatry, Athens University Medical School, 14 Dilou street, GR-161 21 Vironas, Athens, Greece, Tel: (+30) 210-76 40 111, e-mail: gekonst@otenet.gr, george.konstantakopoulos@kcl.ac.uk

Research article
Ερευνητική εργασία

The diathesis-stress model in the emergence of major psychiatric disorders during military service*

Ch. Chasiropoulou, N. Siouti, Th. Mougiakos, S. Dimitrakopoulos

414 Military Hospital of Athens, Psychiatric Clinic, P. Penteli, Greece

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Existing evidence and the diathesis-stress model hypothesis suggest that stress as an environmental factor may trigger the onset of psychiatric disorders, such as psychosis spectrum disorders, mood disorders, anxiety disorders, in people with an underlying vulnerability. The purpose of this study was to determine the period of time during military service at which symptomatology of clinical significance is more often developed, considering that stress of service and adaptation to its requirements is common to all army recruits. A retrospective file study for the years 2017–2018 was conducted in order to identify male soldiers who were hospitalized in the psychiatric clinic of 414 Athens Military hospital and diagnosed as F20–29, F30–39 and F40–48 according to ICD-10. The number of hospitalizations per clinical diagnosis and the time of onset relatively to the month of military service were examined. A total of 139 cases were screened, 119 of which had disorders falling into the diagnostic categories F20–29, F30–39 and F40–48. 53% of total hospitalizations took place within the first two months of a nine-month military service. It was found that the risk of disorder onset within the first two months of military service was statistically higher (OR=0.210, p=0.001) for a schizophrenic spectrum disorder (F20–29) compared to F30–39 and F40–48 disorders. After adjusting for potential confounders, such as heritability for psychiatric disorders, urbanicity, history of substance use or age, the risk for hospitalization within the first two months continued to be significantly predicted by F20–29 disorder (OR=0.255, p=0.022) compared to other diagnoses. Individuals vulnerable in developing a psychotic disorder appear to have lower stress tolerance and may manifest an earlier disease onset, when exposed to the stress of military service compared to subjects predisposed to develop mood or anxiety disorders. Stress during military service is of major importance for the emergence of the whole psychopathology spectrum, particularly in vulnerable individuals. The development of prevention and early intervention strate-

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gies is considered to be of particular importance to conscripts. The findings of the present study are in agreement with the diathesis-stress model and moreover suggest that people who subsequently develop a psychotic spectrum disorder have greater vulnerability to stress exposure.

Key words: Diathesis-stress model, first episode psychosis, psychosocial stress, early intervention.

Introduction

According to the diathesis-stress hypothesis and the biopsychosocial model, psychiatric disorders arise as a consequence of the interaction between genetic, biological predisposition and environmental stress.[1,2] The term "diathesis" describes a person's vulnerability determined by genetic, biological or psychological factors, whereas the term "stress" refers to a major psychosocial event or to a series of minor stressful experiences that may result either in an acute or in a gradual and cumulative burden on someone's mental health and functionality. "Diathesis" presents a resilience threshold. Below this threshold, the clinical phenotype is not expressed, regardless of the stressful event; above it, a psychiatric disorder may be expressed after the individual has been exposed to a certain "quantity" of stress.[1] The hypothesis of diathesis-stress model was originally formulated as a potential pathophysiological mechanism concerning the onset of psychotic disorders and schizophrenia[3] (including the hypothalamic-pituitary-adrenal axis function; neurodevelopmental, epigenetic, neurotransmission, inflammatory processes) and now represents an integrated neurobiological model that provides a mechanistic link between stress biology and the development and progression of psychosis.[4,5] Furthermore, the role of stress has been studied for many years through the prism of the diathesis-stress model also in other major psychiatric disorders such as depression,[6,7] bipolar disorder[8] and anxiety disorders.[9] The research expansion of the diathesis-stress model is otherwise known with the term "gene-environment interaction" (GxE), indicating the effect of environmental factors on the individual's genotype.[10] It is more evident nowadays that, regarding the etiopathogenesis of major psychiatric disorders, there is a strong interplay between biological predisposition and environmental factors,[11,12] such as childhood trauma, cannabis use, migration, urbanity,[13] which either shapes a stress-dysregulation vulnerability during the premorbid period or imposes stress above an individual's resilience threshold, such as major stressful events.[14–16]

Military service can be considered as a potentially major stressful event that affects vulnerable individuals or individuals with low stress threshold. During military service the individual is required to adapt to a demanding environment that operates under hierarchy, regulations and restrictions. This military framework implies separation from family and friends, in many cases for the first time in someone's life, obligatory coexistence with unknown individuals of different cultural and educational backgrounds and moreover disciplined training using weapons under adverse conditions and limited hours of sleep. Previous studies concerning military service have found that despite the psychiatric assessment preceding the conscription, there are many individuals that experience a major psychiatric episode (first episode psychosis, schizophrenia, depression, bipolar disorder) for the first time in their lives during the military service period.[17] The adaptative stress predisposes to subsequent emergence mainly of anxiety disorders,[18] but has also been associated with psychosis onset, early during the military service period.[19–21] As the adaptation to military life can be a framework of a naturalistic study for the impact of psychosocial stress on psychologically predisposed individuals, it would be interesting to study the diathesis-stress model in relation to the onset of major psychiatric disorders.

The purpose of the present study was to examine the diathesis-stress model in regards to the three major diagnostic categories (psychotic/schizophrenic spectrum disorders, mood disorders and anxiety disorders) by determining the period of time during military service at which symptomatology of clinical significance is more often manifested. The research hypothesis is that

individuals who suffer earlier during the military service period may have lower stress threshold, considering that stress of army service and adaptation to its requirements is common to all army recruits. A secondary aim is to study well-known risk factors which could form a stress vulnerability, such as heritability for psychiatric disorders, substance use and urbanicity. To our knowledge, there has been no previous study with comparisons between the major psychiatric disorders relating to the diathesis-stress model.

Material and method

In this retrospective medical file study, 139 cases of male soldiers were identified, who had been hospitalized in the psychiatric clinic of 414 Athens Military hospital during 2017 and 2018 and received an ICD-10 diagnosis.[22] From these records, we used 118 cases which fell into the following diagnostic categories according to ICD-10: F20–29, F30–39, F40–48. We excluded cases with substance use related disorders which did not manifested comorbidity with other major psychiatric disorders. Cases with diagnoses F60–69 were also excluded, considering that personality disorders are a chronic condition (trait) and not a first occurrence of clinical symptomatology (state). Individuals who were previously or during their military service treated for any psychiatric disorder were also excluded, as our study focused on the effect of psychosocial stress on the onset of psychiatric disorders without the protective effect or symptomatology delay that a treatment may offer. From the medical records that were eventually used, apart from data relating to ICD-10 diagnosis and the month of military service period when soldiers were hospitalized, we also collected data about age, heritability for psychiatric disorders in relatives up to second degree, reported substance use both before and during recruitment, and urban residence (great urban center with a population of over 500,000 inhabitants or not).

In order to increase statistical power, since the 53% of the hospitalizations took place during the first two months of the military service period, we converted the variable of interest for the hospitalization month from continuous to binary (1=first two months, 2=remaining seven months of service). We also divided cases into three groups based on ICD-10 psychiatric diagnoses (1=F20–29, 2=F30–39, 3=F40–48). We performed statistical analysis using logistic regression to estimate the probability of disorder onset in the first two months of the military service period, compared to the following months. In the second phase of the analysis, we adapted the model for potential confounding factors, such as heritability, substance use, urban residence and age at disorder's onset. All analyzes were performed using the statistical package SPSS version 25.0.

Results

Our final sample consisted of 118 individuals (all males). The average age of the subjects when hospitalized was 22.5 years (SD=±3.064), 50% (n=59) were living in a large urban center, 17.8% (n=21) reported heritability for mental illness, 22.1% (n=25) reported a history of substance use, of which 44% (n=11) reported recent use (within last month).

Regarding to the distribution of hospitalizations per month of military service, 38.1% (n=45) of the hospitalizations took place during the first month of service period, 15.3% (n=18) during the second month, while the remaining 46.6% (n=55) from the third to the 9th month, when the military service period is completed (figure 1).

Diagnoses were distributed as follows: anxiety disorders (F40–48) 59.3% of total sample (n=70),

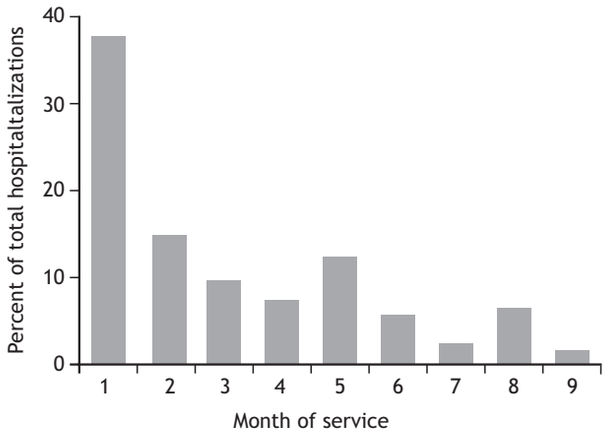

Figure 1. Distribution of hospitalizations (percentage of total number of hospitalizations) per month of military service period.

schizophrenic spectrum disorders (F20–29) 29,7% of total sample (n=35), and mood disorders (F30–39) 29,7% of total sample (n=13). These three diagnostic groups were further distributed according to the month of military service period when hospitalization took place (figure 2). As demonstrated in the diagram of figure 2, for those who were hospitalized and diagnosed as F20–29 the disorder's onset takes place mainly during the first two months of military service, while for the first two months less individuals were hospitalized as F30–39 and F40–48.

From the logistic regression analysis, it is clear that the onset of mental illness within the first two months of military service is predicted with statistical significance from schizophrenic/psychotic spectrum disorders and not from the other diagnostic categories (table 1). After adjustment for confounding factors such as heritability for mental illness, substance use, urban residence and age, the onset of psychiatric disorder within the first two months of the military service continued to be predicted with statistical significance from the variable F20–29, while the other diagnoses did not appear to be related with early onset during the service period (table 1).

Discussion

Our study attempted to determine the period of time during military service at which major psychiatric disorders are developed, specifically psychotic/schizophrenic spectrum disorders, mood disorders and anxiety disorders. According to diathesis-stress model, we hypothesized that psychosocial stress during military service may trigger the onset of major psychopathology, resulting in more hospitalizations during the first months of the military service period of individuals with greater vulnerability or lower stress tolerance. Our findings suggest that individuals with psychotic/schizophrenic spectrum disorder are more vulnerable to stress compared to the other individuals with other diagnosis, since most hospitalizations for psychotic disorders occur during the first two months. To our knowledge, this first study that compared major diagnostic categories regarding psychosocial stressors that may interact with an underlying vulnerability.

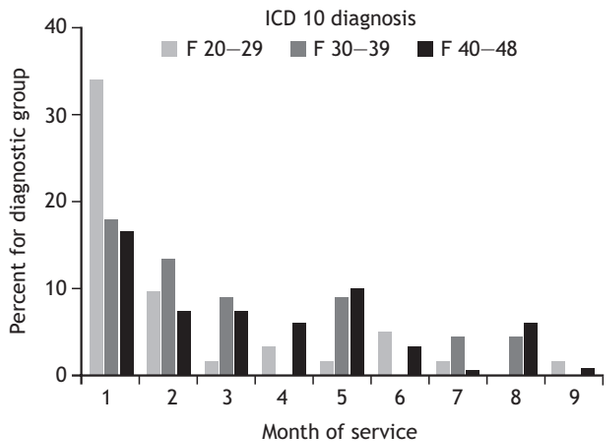

Figure 2. Distribution of diagnosis rates (of total percentage for each diagnosis) per month of military service period.

A key conclusion of the study is that adaptation stress during military service, favors the onset of psychotic episodes, early during this period. This finding is in agreement with similar studies of the past[19–21] reporting an increase in the incidence of first psychotic episodes during the first months of military service period. It is reasonable to assume that the initial adjustment period implies increased stress compared with the period of time that follows (for this reason 53.4% of total hospitalizations occur during the first two months of military service period) and that individuals with the lower stress resilience or lower stress tolerance are more vulnerable to a disorder onset. However, this appears to occur in individuals who experience psychotic spectrum symptoms rather than mood disorders or anxiety disorders. The question arises whether these individuals were ill before military recruitment, so the hospitalization during the first month of military service period may reflect the first detection of the disorder. It is noted that previous studies[19,21] have ruled out this possibility demonstrating that the disorder onset occurs during the military service period. Moreover, psychological and psychiatric evaluation of all recruits take place during the recruitment process, and in this way, individuals with an established disorder are excluded from military service through postponement or discharge without hospitalization. However, it cannot be ruled out that individuals with subclinical psychotic symptoms may be undetected during the initial clinical evaluation.

Table 1. Hospitalization within the first two months of military service period related to diagnoses (with and without adjustment for heritability, substance use, place of residence and age).

ICD 10 Diagnosis	OR Exp(B)	Wald	p	Adjusted OR Exp(B)	Wald	p
F20–29	0.210	11.054	<0.001	0.255	5.285	0.022
F30–39	0.606	0.680	0.410	0.798	0.113	0.737
F40–48	1		–	1		–

Another important conclusion of the study is that, in line with the diathesis-stress model, individuals with psychotic/schizophrenia spectrum disorder have lower stress threshold than those who develop a mood disorder or anxiety disorder. This finding can be interpreted either in terms of the quantity or qualitative aspects of the stress under which each individual that later develops psychopathology is exposed. As far as the quantitative aspects are concerned, since adapting to the needs of the military service, which is mandatory, is common for all recruits, the focus is more on the individual's stress tolerance, which seems to be lower in the individuals who subsequently experience psychotic symptoms. It is well known that there is an association between the appearance of psychosis with recent major life events that involve acute stress[23] or daily stress in a demanding environment that cumulatively exceeds the potential counterbalance and the individual's stress tolerance.[24] Concerning the qualitative aspects of stress, psychosocial stress induces the appearance of psychosis[25,26] in vulnerable individuals, increases schizotypal features in healthy individuals,[27] while its reduction during the military service period is associated with minimizing the risk for psychotic symptomatology onset.[28] During military service, a conscript may be exposed to stressors that may be considered as a kind of threat for the social self.[29] The recruit has to adapt to a new, demanding environment away from the family and social network safety, potentially experiencing situations that may be perceived as social devaluation, intimidation, isolation,[21] resembling the social defeat hypothesis,[30] increasing the risk for psychotic symptomatology onset.

Besides the nature of psychosocial stress, it was found that other aspects of military service, such as involvement in warfare operations, do not increase the risk for psychosis onset, but for anxiety disorders, especially post-traumatic stress disorder.[31] Anxiety spectrum disorders are triggered by stressors related with life events that cause fear of loss of control and seem to be associated with childhood trauma, particularly emotional abuse and parental rejection.[32,33] Quality stress factors that predispose to anxiety disorders in young population appear to be more related to fear of loss of health or destabilization in the parental environment (health problems, financial hardship, parental hostility).[34] History of child abuse is considered a risk factor for the appearance of both anxiety disorders and depression[32] for individuals who are exposed to the stressful military environment. The onset of depressive symptomatology is associated with life events related to the loss of an important person or change in life role.[1] Similarly, bipolar disorder is associated with important life events for which stress quality is about achieving life goals[35] or routine interruption but not negative life events.[36] Such life events may trigger manic symptoms in individuals with vulnerability. From the above it can de concluded that both the intensity of the stress factor and the different types of stressors may trigger different vulnerability mechanisms and phenotypic expression. During military service, especially the period of adjustment, intense psychosocial stress in terms of interpersonal interaction may be a more specific mechanism for triggering the vulnerability for psychosis rather than for anxiety or mood disorders.

Acknowledgment of stress-related mechanisms triggering major psychiatric disorders and detection of high-risk populations is a primary objective in terms of prevention and early intervention.[37] Worldwide, over the past 20 years, mental health services have been developed aiming at early recognition and intervention for young people at risk

of having a mental disorder, especially psychosis.[38,39] Similar efforts are systematically organized also in Greece.[40,41] The significance of early intervention and development of prevention strategies for vulnerable populations are increasingly gaining ground in the military environment.[42] A recent study in the Greek army revealed that the duration of untreated psychosis is minimal for soldiers experiencing a first episode psychosis compared to the average time in the community.[21] This may be of particular importance for the later progression and course of the psychotic disorder. The development of prevention strategies and therapeutic interventions in relation to stress management is of high importance for delaying the onset of serious psychiatric disorders. In our study, characteristics such as heritability for psychiatric disorders, substance use, urbanity, did not appear to be related with earlier onset of psychiatric disorders during military service and thus greater vulnerability. However, the sample may be considered relatively small for the evaluation of these effects. In general, social stress management and existence of social support mechanisms, as described in the proposed Diathesis Stress Support model[43] which integrates mechanisms for modifying stress and vulnerability factors, are considered to be of particular importance for the protection and early treatment of individuals at risk or with recent onset of clinical symptomatology.

In this study we conducted a comparative analysis of the diathesis-stress model in major psychiatric disorders. It is concluded that the quality and intensity of psychosocial stress may trigger an underlying vulnerability in individuals who experience a psychotic disorder early during the period of military service. According to diathesis-stress model, stress threshold is probably lower in individuals who later develop psychotic symptomatology, comparing to those who experience mood or anxiety disorder. Limitations of the present study were the inclusion of only young males and the relatively small sample for the examination of potential confounding factors. Future studies could provide a deeper understanding of stress mechanisms related to emergence of major psychiatric disorders in order to develop and implement prevention and early intervention strategies for populations in need.

Το μοντέλο διάθεσης-στρες στην ανάδυση μειζόνων ψυχιατρικών διαταραχών κατά τη διάρκεια της στρατιωτικής θητείας

Χ. Χασιροπούλου, Ν. Σιούτη, Θ. Μουγιάκος, Σ. Δημητρακόπουλος

414 ΣΝΕΝ, Ψυχιατρική Κλινική, Π. Πεντέλη, Αττική

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Προϋπάρχοντα ευρήματα και το μοντέλο διάθεσης-στρες (diathesis-stress model) δείχνουν ότι το στρες ως περιβαλλοντικός παράγοντας μπορεί να λειτουργήσει πυροδοτικά στην εμφάνιση ψυχιατρικών νόσων, όπως διαταραχές του ψυχωσικού φάσματος, διαταραχές της διάθεσης και αγχώδεις διαταραχές σε άτομα με υποκείμενη ευαλωτότητα. Σκοπός της παρούσης μελέτης ήταν ο προσδιορισμός της χρονικής περιόδου της στρατιωτικής θητείας κατά την οποία συνηθέστερα εκδηλώνεται η οποιαδήποτε κλινικής σπουδαιότητας συμπτωματολογία, θεωρώντας ότι το στρες της θητείας και της προσαρμογής στις απαιτήσεις της είναι κοινό για όλους τους στρατεύσιμους. Σε αναδρομική μελέτη αρχείου για τα έτη 2017–2018 εντοπίστηκαν οι άρρενες στρατιώτες που νοσηλεύτηκαν στην Ψυχιατρική κλινική του 414 ΣΝΕΝ με διαγνώσεις F20–29, F30–39 και F40–F48 κατά ICD-10. Εξετάστηκε ο αριθμός των νοσηλειών ανά κλινική διάγνωση και ο χρόνος εμφάνι-

σης, όσον αφορά στον μήνα θητείας κάθε νοσηλευόμενου, της αντίστοιχης κλινικής διαταραχής. Εξετάστηκαν συνολικά 139 περιστατικά, τα 118 εκ των οποίων αφορούσαν σε διαταραχές με διαγνώσεις F20–29, F30–39 και F40–F48. Το 53% των νοσηλειών έλαβε χώρα τους πρώτους δύο μήνες θητείας από σύνολο εννέα μηνών. Διαπιστώθηκε ότι ο κίνδυνος νόσησης τους δύο πρώτους μήνες θητείας ήταν στατιστικά σημαντικότερος (OR=0,210, p=0,001), εάν αφορούσε σε διαταραχή του σχιζοφρενικού φάσματος (F20–29) σε σχέση με διαταραχές F30–39 και F40–F48. Μετά από προσαρμογή της ανάλυσης για παράγοντες σύγχυσης, όπως η κληρονομικότητα για ψυχιατρική νόσο, η αστικότητα, το ιστορικό χρήσης ουσιών ή η ηλικία νόσησης, ο κίνδυνος νοσηλείας τούς δύο πρώτους μήνες συνέχισε να προβλέπεται κατά στατιστικά σημαντικό τρόπο από νόσηση με διαταραχή F20–29 (OR=0,255, p=0,022) σε σύγκριση με άλλες διαγνώσεις. Τα άτομα με προδιάθεση για ανάπτυξη ψυχωσικής διαταραχής φαίνεται ότι έχουν χαμηλότερο ουδό ανοχής στο στρες και ενδεχομένως νοσούν νωρίτερα κατά τη διάρκεια της επίδρασης τού στρες της θητείας σε σύγκριση με άτομα με προδιάθεση ανάπτυξης διαταραχών διάθεσης ή αγχωδών διαταραχών. Το στρες κατά τη διάρκεια της θητείας είναι μείζονος σπουδαιότητας για την εμφάνιση όλου του φάσματος της ψυχοπαθολογίας, ιδιαίτερα σε ευάλωτα άτομα. Η ανάπτυξη στρατηγικών πρόληψης και έγκαιρης παρέμβασης κρίνονται ως ιδιαίτερης σημασίας για τους στρατεύσιμους. Τα ευρήματα της παρούσας μελέτης συμφωνούν με το μοντέλο στρες-διάθεσης και επιπρόσθετα υποδεικνύουν ότι τα άτομα που μετέπειτα αναπτύσσουν διαταραχή ψυχωσικού φάσματος, έχουν μεγαλύτερη ευαλωτότητα στην επίδραση του στρες.

Λέξεις ευρετηρίου: Μοντέλο διάθεσης-στρες, πρώτο ψυχωσικό επεισόδιο, ψυχοκοινωνικό στρες, έγκαιρη παρέμβαση.

References

1. Monroe SM, Simons AD. Diathesis-Stress Theories in the Context of Life Stress Research: Implications for the Depressive Disorders. *Psychol Bull* 1991, 110:406–425, PMID: 1758917
2. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science* 1977, 196:129–136, PMID: 847460
3. Walker EF, Diforio D. Schizophrenia: a neural diathesis-stress model. *Psychol Rev* 1997, 104:667–685, PMID: 9337628
4. Walker E, Mittal V, Tessner K. Stress and the hypothalamic pituitary adrenal axis in the developmental course of schizophrenia. *Annu Rev Clin Psychol* 2008, 4:189–216, doi:10.1146/annurev.clinpsy.4.02 2007.141248
5. Pruessner M, Cullen AE, Aas M, Walker EF. The neural diathesis-stress model of schizophrenia revisited: An update on recent findings considering illness stage and neurobiological and methodological complexities. *Neurosci Biobehav Rev* 2017, 73:191–218, doi: 10.1016/j.neubiorev.2016.12.013
6. Patten SB. Major depression epidemiology from a diathesis-stress conceptualization. *BMC Psychiatry* 2013, 13:19, doi:10.1186/1471-244X-13-19
7. Colodro-Conde L, Couvy-Duchesne B, Zhu G, Coventry WL, Byrne EM, Gordon S et al. A direct test of the diathesis-stress model for depression. *Mol Psychiatry* 2017, 23:1590–1596, doi:10.1038/mp.2017.130
8. Brietzke E, Mansur RB, Soczynska J, Powell AM, McIntyre RS. A theoretical framework informing research about the role of stress in the pathophysiology of bipolar disorder. *Prog Neuropsychopharmacol Biol Psychiatry* 2012, 39:1–8, doi:10.1016/j.pnpbp.2012.05.004
9. Williams NL, Reardon JM, Murray KT, Cole T. Anxiety Disorders: A developmental vulnerability-stress perspective. In: Hankin BL, Abela JRZ (eds) *Development of psychopathology: A vulnerability-stress perspective*. Sage Publications, Thousand Oaks, CA, 2005:289–327
10. Assary E, Vincent JP, Keers R, Pluess M. Gene-environment interaction and psychiatric disorders: Review and future directions. *Semin Cell Dev Biol* 2018, 77:133–143, doi: 10.1016/j.semcdb.2017.10.016
11. Schmitt A, Malchow B, Hasan A, Falkai P. The impact of environmental factors in severe psychiatric disorders. *Front Neurosci* 2014, 8:19, doi:10.3389/fnins.2014.00019
12. van Os J, Kenis G, Rutten BPF. The environment and schizophrenia. *Nature* 2010, 468:203–212, doi:10.1038/nature09563
13. Radua J, Ramella-Cravaro V, Ioannidis JPA, Reichenberg A, Phiphopthatsanee N, Amir T et al. What causes psychosis? An umbrella review of risk and protective factors. *World Psychiatry* 2018, 17:49–66, doi:10.1002/wps.20490
14. Miloyan B, Joseph Bienvenu O, Brilot B, Eaton WW. Adverse life events and the onset of anxiety disorders. *Psychiatry Res* 2018, 259:488–492, doi:10.1016/j. psychres.2017.11.027
15. Tennant C. Life Events, Stress and Depression: A Review of Recent Findings. *Aust N Z J Psychiatry* 2002, 36:173–182, doi:10.1046/j.1440-1614.2002. 01007.x
16. Myin-Germeys I, Krabbendam L, Delespaul PA, Van Os J. Do life events have their effect on psychosis by influencing the emotional reactivity to daily life stress? *Psychol Med* 2003, 33:327–333, PMID:12622311

17. Herrell R, Henter ID, Mojtabai R, Bartko JJ, Venable D, Susser E et al. First psychiatric hospitalizations in the US military: the National Collaborative Study of Early Psychosis and Suicide (NCSEPS). *Psychol Med* 2006, 36:1405–1415, doi:10.1017/S0033291706008348
18. Hageman I, Pinborg A, Andersen HS. Complaints of stress in young soldiers strongly predispose to psychiatric morbidity and mortality: Danish national cohort study with 10-year follow-up. *Acta Psych Scand* 2007, 117:148–155, doi:10.1111/j.1600-0447.2007.01129.x
19. Steinberg HR, Durell J. A stressful social situation as a precipitant of schizophrenic symptoms: an epidemiological study. *Br J Psychiatry* 1968, 114: 1097–1105, doi:10.1192/bjp.114.514.1097
20. Hatzitaskos P, Soldatos C, Giouzelis G et al. Psychotic symptomatology first appeared in the military environment. *Psychiatriki* 1997, 8:41–48
21. Dimitrakopoulos S, Vitoratou S, Mougiakos T, Bogeas N, Giotakos O, van Os J et al. Steinberg and Durell (1968) revisited: increased rates of First Episode Psychosis following military induction in Greek Army Recruits. *Psychol Med* 2018, 48:728–736, doi: 10.1017/S0033291717002276
22. World Health Organization. ICD-10: international statistical classification of diseases and related health problems: tenth revision, 2nd ed. World Health Organization, Geneva, 2004
23. Wiles NJ, Zammit S, Bebbington P, Singleton N, Meltzer H, Lewis G. Self-reported psychotic symptoms in the general population: results from the longitudinal study of the British National Psychiatric Morbidity Survey. *Br J Psychiatry* 2006, 188:519–526, doi:10.1192/bjp. bp.105.012179
24. Tessner KD, Mittal V, Walker EF. Longitudinal study of stressful life events and daily stressors among adolescents at high risk for psychotic disorders. *Schizophr Bull* 2009, 37:432–441, doi: 10.1093/schbul/sbp087
25. van Winkel R, Stefanis NC, Myin-Germeys I. Psychosocial stress and psychosis. A review of the neurobiological mechanisms and the evidence for gene-stress interaction. *Schizophr Bull* 2008, 34:1095–1105, doi:10.1093/schbul/sbn101
26. Corcoran C, Walker E, Huot R, Mittal V, Tessner K, Kestler L et al. The stress cascade and schizophrenia: etiology and onset. *Schizophr Bull* 2003, 29:671–692, PMID: 14989406
27. Hatzimanolis A, Avramopoulos D, Arking DE, Moes A, Bhatnagar P, Lencz T et al. Stress-Dependent Association Between Polygenic Risk for Schizophrenia and Schizotypal Traits in Young Army Recruits. *Schizophr Bull* 2017, 44:338–347, doi: 10.1093/schbul/sbx074
28. Stefanis NC, Henquet C, Avramopoulos D, Smyrnis N, Evdokimidis I, Myin-Germeys I et al. COMT val158met moderation of stress-induced psychosis. *Psychol Med* 2007, 37:1651–1656, doi:10.1017/S0033291707001080
29. Jones SR, Fernyhough C. A new look at the neural diathesis-stress model of schizophrenia: the primacy of social-evaluative and uncontrollable situations. *Schizophr Bull* 2006, 33:1171–1177, doi:10.1093/schbul/sbl058
30. Selten JP, van der Ven E, Rutten BPF, Cantor-Graae E. The social defeat hypothesis of schizophrenia: an update. *Schizophr Bull* 2013, 39:1180–1186, doi:10.1093/schbul/sbt134
31. Reijnen A, Rademaker AR, Vermetten E, Geuze E. Prevalence of mental health symptoms in Dutch military personnel returning from deployment to Afghanistan: a 2-year longitudinal analysis. *Eur Psychiatry* 2015, 30:341–346, doi:10.1016/j.eurpsy.2014.05.003
32. Reinelt E, Stopsack M, Aldinger M, John U, Grabe HJ, Barnow S. Testing the diathesis-stress model: 5-HTTLPR, childhood emotional maltreatment, and vulnerability to social anxiety disorder. *Am J Med Genet B Neuropsychiatr Genet* 2013, 162:253–261, doi: 10.1002/ajmg.b.32142
33. Bandoli G, Campbell-Sills L, Kessler RC, Heeringa SG, Nock MK, Rosellini AJ et al. Childhood adversity, adult stress, and the risk of major depression or generalized anxiety disorder in US soldiers: a test of the stress sensitization hypothesis. *Psychol Med* 2017, 47:2379–2392, doi:10.1017/S00332917 17001064
34. McLaughlin KA, Hatzenbuehler ML. Stressful life events, anxiety sensitivity, and internalizing symptoms in adolescents. *J Abnorm Psychol* 2009, 118:659–669, doi: 10.1037/a0016499
35. Johnson SL, Cueller AK, Ruggero C, Winett-Perlman C, Goodnick P, White R et al. Life events as predictors of mania and depression in bipolar I disorder. *J Abnorm Psychol* 2008, 117:268–277, doi: 10.1037/0021-843X.117.2.268
36. Johnson SL. Life events in bipolar disorder: towards more specific models. *Clin Psychol Rev* 2005, 25:1008–1027, doi: 10.1016/j.cpr. 2005.06.004
37. World Health Organization. *Prevention of mental disorders. Effective interventions and policy options*. World Health Organization, Geneva, 2004
38. Fusar-Poli P, McGorry PD, Kane JM. Improving outcomes of first-episode psychosis: an overview. *World Psychiatry* 2017, 16:251–265, doi: 10.1002/ wps.20446
39. Dimitrakopoulos S, Kollias C, Stefanis NC, Kontaxakis V. Early psychotic experiences: Interventions, problems and perspectives. *Psychiatriki* 2015, 26:45–54, PMID: 25880383
40. Kollias C, Xenaki LA, Dimitrakopoulos S, Kosteletos I, Kontaxakis V, Stefanis N et al. Early psychosis intervention outpatient service of the 1st Psychiatric University Clinic in Athens: 3 Years of experience. *Early Interv Psychiatry* 2018, 12:491–496, doi: 10.1111/eip.12407
41. Stefanis NC, Mavreas V, Nimatoudis I, Gourzis F, Sarakouri M, Vgontzas A et al. A proposal for the implementation of Early Intervention in Psychosis (EIP) services in Greece: If not now, when? *Psychiatriki* 2018, 29:107–117, doi: 10.22365/jpsych.2018.292.107
42. Hann MC, Caporaso E, Loeffler G, Cuellar A, Herrington L, Marrone L et al. Early interventions in a US military FIRST episode psychosis program. *Early Interv Psychiatry* 2018, 12:1243–1249, doi: 10.1111/eip.12709
43. Cheng SC, Walsh E, Schepp KG. Vulnerability, Stress, and Support in the Disease Trajectory from Prodrome to Diagnosed Schizophrenia: Diathesis-Stress-Support Model. *Arch Psychiatr Nurs* 2016, 30:810–817, doi:10.1016/ j.apnu. 2016.07.008

Corresponding author: S. Dimitrakopoulos, Psychiatric Clinic, 414 Military Hospital, 6 Taxiarchou Velliou street, GR-152 36 P. Penteli, Attica, Greece, Tel: (+30) 210-81 06 532, e-mail: stefandimi13@gmail.com

Research article
Ερευνητική εργασία

Association between happiness and psychopathology in an elderly regional rural population in Crete

N. Nikolakakis,[1] E. Dragioti,[2] N. Paritsis,[1] K. Tsamakis,[3] N.G. Christodoulou,[4] E.N. Rizos[3]

[1]Department of Psychiatry and Behavioral Sciences, Faculty of Medicine, University of Crete, Heraklion, Crete, Greece,
[2]Department of Medical and Health Sciences, Linköping University, Linköping, Sweden,
[3]2nd Department of Psychiatry, University of Athens, "Attikon" Hospital, Athens, Greece,
[4]Department of Psychological Medicine, Nottinghamshire Healthcare NHS Foundation Trust, University of Nottingham Medical School Chair, World Psychiatric Association, Section of Preventive Psychiatry, UK

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Research has shown that socio-demographic profile and psychopathology symptoms are related to levels of happiness in old age. The aims of this cross-sectional study were: 1) to investigate the effect of recent stressful life events and socio-demographic factors on psychopathological symptoms in elderly residents in mountain regions of Crete, Greece and 2) to explore the mechanism which underlies the relationship between socio-demographic factors and psychopathological symptoms, with levels of happiness in old age. To this end, we used the nine psychopathology dimensions of symptoms as defined in the Symptom Checklist-90-R (SCL-90), while the Holmes and Rahe stress inventory was administered to quantify the stressful life events. A sample of 205 elderly men and women (age=77.1±6.7 years) living in 10 remote rural and isolated villages participated in this study. Data was collected through questionnaires completed upon individual meetings with each participant, with the interviewer's assistance. Each questionnaire included the two aforesaid scales alongside questions on individual socio-demographic characteristics. Analysis of variance was applied to detect socio-demographic factors that have a significant effect on specific psychopathological symptoms. Then, path analysis was applied to quantify the direct and indirect effect of the selected socio-demographic factors on happiness levels. Stressful life events were found to have no statistically significant effect on the presence of specific symptoms (somatization, psychoticism, anxiety) in elderly adults. Furthermore, certain socio-demographic factors (marital status, smoking, family income and social activity) were found to influence happiness, which varied according to the level of psycho-emotional tension. The results suggest that somatization, psychoticism, and phobic anxiety symptoms are psychic reactions independent of recent stressful life events. Our study,despite its regional character, may contribute in the develop-

ment of appropriate clinical assessment tools and interventions, helping primary care practitioners to approach elderly people living in remote villages in a more appropriate and holistic manner, improving thereby the effectiveness of their interventions.

Key words: Psychological distress, life stressful events, somatization, psychoticism, phobic anxiety.

Introduction

The association between stressful life events and presence of psychopathological symptoms in adult life has been extensively studied in the literature and a clear connection has been established. Physical health problems and stressful life events often co-exist and contribute to the appearance of mental-health problems in the elderly (i.e. those aged >65 years).[1,2] However, the association between demographic variables and mental health has not been sufficiently studied in elderly populations residing in rural, remote villages. More specifically, a research gap exists on the relation between socio-demographic factors and happiness levels, as well as on how psychopathology affects this relationship in this target group. Such studies on mental health in the elderly population in rural and remote regions are of utmost importance, considering the special characteristics of these areas, such as low population density with small settlements and poor accessibility to healthcare services.[3]

Research suggests that several factors have an impact on mental health in the elderly. Marriage and a close social network have been positively associated with psychological well-being and happiness,[4–7] whereas low socio-economic status, stressful life events, and living alone[8] have been identified as risk factors for the development of psychopathological symptoms.[9,10] Moreover, smoking and alcohol consumption have been reported to correspond with increased levels of depression in elderly people.[11,12] A link between a high body mass index (BMI) and depression is also reported,[13] as well as a link between high BMI and high levels of hostility.[14]

Poor physical health in old age has been linked with depression,[15] anxiety disorders,[16,17] high levels of hostility,[14] and psychotic symptoms.[18] Depression and anxiety in the elderly may often co-exist with somatic illnesses[19] and habitually manifest through somatic symptoms.[4] In addition, medical conditions are frequently associated with manifestation of somatization symptoms in the elderly.[20] As a result, late-life depression can lead to increased number of medical appointments per year, increased use of hospitals, and longer duration of hospital stay.[12,21] Anxiety disorders are also a primary cause of hospitalization and increased use of health services.[22]

Previous studies have highlighted that unfavourable social, economic, and environmental circumstances can have a significant negative impact on mental health. In regards with elderly rural populations, major stressful life events, such as illness or bereavement, can trigger depression, anxiety states, panic syndromes, and post-traumatic stress disorder.[23] Thus, it is of a significant interest to investigate the way in which various socio-demographic factors affect the presence of psychopathology symptoms in the sample being studied, and the impact on the subjects' happiness.

Material and method

Subjects and procedure

The present study took place from January 2015 to January 2016 in the mountain villages of Crete, Greece. A convenience sample of elderly (i.e., above 65 years old) men and women living in 10 rural and remote villages was chosen from the population registers of the Prefectures of Chania and Rethymno. These villages were selected through a list of rural villages of Chania and Rethymno and specifically of the Municipality of Sfakia, Selinou, and Milopotamou. The selection of villages on these regional areas was solely based on them being at an altitude of more than 350 meters above sea level. For the sample selection a door-to-door snowball sampling method was used. Older adults who: (i) did not live in private households (e.g., guests or homeless), (ii) had cognitive impairment as assessed by the first investigator, and (iii) did not give their

consent, were excluded from the study. Approval of the study protocol was obtained from the ethics committee of the Medical School of the University of Crete (Heraklion, Greece; protocol number: 385/28/05/2008).

All questionnaires were completed upon individual meetings with each participant, with the interviewer's assistance. The interviewer was reading the items aloud to the elderly and was recording their answers. This method was chosen because the population was, overall, of low educational level, which could potentially cause difficulties in completing the self-reporting parts of the questionnaires. The participants' capacity to participate and consent was formally assessed by the first investigator, who is a Consultant Psychiatrist. Information on the purpose of the study was given verbally to participants and additional clarifications were provided when required. All interviews were carried out during individual home visits. Each interview lasted less than one hour.

Instruments

Psychopathology symptoms

The Greek version of the Symptom Checklist-90-R (SCL-90-R)[24] was administered in order to detect a wide range of symptoms of psychopathology, as well as their intensity. It is a 90-item self-report measure of current, point-in-time, psychological symptoms. Each item is scored on a five-point Likert scale of distress ranging from 0 (none) to 4 (extreme) and indicates the prevalence of symptom occurrence during the time reference.[25] SCL-90-R consists of nine primary symptom dimensions: (i) Somatization, (ii) Obsessive-Compulsive, (iii) Interpersonal Sensitivity, (iv) Depression, (v) Anxiety, (vi) Hostility, (vii) Phobic Anxiety, (viii) Paranoid Ideation, and (ix) Psychoticism. This scale also produces three global indices of distress: (i) Global Severity Index (GSI), which is a global index of distress and is the mean value of all 90 items; (ii) Positive Symptom Distress Index (PSDI); which is an intensity index and is the mean score of the items scored above zero; (iii) Positive Symptom Total (PST), which is the number of items scored above zero. Higher scores on SCL-90-R subscales indicate psychopathological symptoms of increased intensity.

Stressful life events

The Holmes and Rahe stress inventory[26] consists of 43 stressful life events that took place during the past year of the individual's life, which were found to frequently precede illness onsets, thus potentially affecting the individual's health. Its purpose is to provide a single measure reflecting the influence of these stressful events on a person's health over a one-year period. The participants select the events and a score is calculated (herein denoted as LSI) by summing up the corresponding weights associated with each selected event. This score indicates the probability that the subject will become ill. A total score of ≤150 is normal, while a score between 150 and 300, implies that there is an almost 50% chance of getting ill in the next 2 years. Gerst et al[27] tested the reliability of the Holmes and Rahe stress inventory and found that rank ordering remained extremely consistent both for healthy adults (r=0.96 –0.89) and patients (r=0.91 to 0.70).

Demographic and social data

Participants reported their age, sex, educational and marital status and the monthly income of the main provider in of the family. Furthermore, they answered questions about the frequency of their social life activities; this was defined as "kafeneio"(=coffeehouse) visits for men; neighbour/friend visits for women. These activities were chosen because they were thought to be the most prevalent social activities for each sex accordingly, consistent with the cultural norms in this predefined geographical area.

Happiness

To assess happiness, participants answered questions about the level of happiness they experienced living in a village, based on a 5 – item Likert scale. This last response was used in the path model as an indicator of overall happiness.

Health status and access to healthcare services.

Presence of chronic physical illness (somatic illness lasting for more than 12 months), treatment with medications, smoking status and consumption of alcohol were recorded. Since there were many

groups with small frequency in both smoking status and alcohol consumption variables, both were reformed into two binary variables (smoking – non-smoking, and no consumption of alcohol – consumption of one to two units per day). Height and weight of participants were self-reported. BMI was calculated using the metric system measurements (kilograms and meters); according to World Health Organization classification, overweight was defined as BMI between 25 and 29.9 kg/m^2, and obesity was defined as BMI≥30 kg/m^2. In addition, participants reported on the distance of their residence to the nearest health centre, the number of physician visits in the previous month, and the number of hospitalizations during the last 12 months.

Statistical analysis

All data were analysed using SPSS statistical package (version 20) and R statistical language (R Core Team, 2013) equipped with lavaan package.[28] Independent samples t-test was applied in order to specify the psychopathological symptoms which significantly differentiated from typical values for Greek population.[24] The values which were found to be significantly higher in the sample, compared to the typical Greek population, were further examined for their influence on happiness with an appropriate path model; the Holmes and Rahe stress score, socio-demographic and medical factors were included as exogenous variables, whereas happiness was the dependent variable. The selected psychopathological symptoms were positioned as mediators in the relationship between socio-demographic variables and happiness.

The mahalanobis distance was calculated for all cases and two cases were identified as multivariate outliers, thus excluded from the subsequent analysis. The model was tested using the maximum likelihood estimation. Effects with $p<0.05$ were considered statistically significant.

Results

The sample consisted of 205 participants aged 65–93 years old (M=77.1, SD=6.7). Demographic and medical characteristics of the participants are presented in table 1. All villages were located at an altitude of more than 350 meters above sea level and the mean distance to the nearest health centre was 22.8 km.

Table 1. Demographic and medical characteristics of the participants.

Characteristic	N (%)
Age, mean (SD)	77.1 (6.7)
Gender	
Men	101.0 (49.3)
Women	104.0 (50.7)
Educational level	
None	36.0 (17.6)
Primary school	149.0 (72.7)
Middle/High school	20.0 (9.8)
Married	157.0 (76.6)
How often do you go to the coffee-house (for men)/visit your neighbor/ friend (for women)	
Everyday	165.0 (81.3)
Often	10.0 (4.9)
Rarely	12.0 (5.9)
Never	16.0 (7.9)
Smoking	27.0 (13.2)
Body Mass Index	
Normal	66.0 (32.2)
Overweight	96.0 (46.8)
Obese	43.0 (21.0)
Alcohol consumption	65.0 (31.7)
Chronic somatic disease	189.0 (92.2)
Medication	143.0 (69.8)
Distance to nearest health center, mean (SD)	22.8 (9.2)
Number of visits to a physician in the last month, median (IQR)	1.0 (0–2)
Number of hospitalizations during last 12 months, median (IQR)	0.0 (0–0)
Monthly income of the person gaining the main income in the house (euros)	
≤500	62.0 (30.2)
500–1000	111.0 (54.1)
1000–1500	22.0 (10.7)
1500–2000	10.0 (4.9)

Most of the participants were satisfied (N=84, 41%) or very satisfied (N=90, 43.9%) from their life in the village.

Somatization (SOM) (p=0.001), psychoticism (PSY) (p<0.001), and phobic anxiety (PHB) (p<0.001), were significantly higher than typical healthy Greek population. The rest of the psychopathological symptoms were either significantly lower or did not have a significant difference compared to the typical Greek population (table 2).

The theoretical model presented in figure 1 was formulated and tested. The model had a very good fit, with a non-significant chi-square ($c^2(33)=40.557$, p=0.172); this implies that the assumed path model is adequate for the data, that is, the sample covariance matrix was not significantly different from the model-based estimated covariance matrix.

The model had a very good fit to the data ($c^2(78)=386.240$, p<0.001), accounting for 39.5% of phobic anxiety, 27.8% of somatization, 26.7% of psychoticism and 23.6% of happiness variances (table 3).

The standardized regression coefficients are presented in figure 2.

Alcohol consumption (ALK) did not have a significant effect on the presence of psychopathology symptoms ($p_{SOM}=0.376$, $p_{PHB}=0.355$, $p_{PSY}=0.055$), while it had a significant negative effect on happiness (HPN) ($b_{std}=-0.194$, b=−0.075, p=0.007). Smoking (SMK) also did not have a significant effect on somatization, phobic anxiety and on happiness ($p_{SOM}=0.444$, $p_{PHB}=0.648$, $p_{HPN}=0.090$). Nevertheless, smokers had higher levels of psychoticism than non-smokers ($b_{std}=0.158$, b=0.033, p=0.015).

In regards with the total score of Holmes and Rahe stress inventory (denoted as LSI), it was not found to have a significant effect on psychopathology ($p_{SOM}=0.980$, $p_{PHB}=0.564$, $p_{PSY}=0.251$) while it had a significant negative effect on happiness (HPN) ($b_{std}=-0.206$, b=−0.001, p=0.004).

There was no statistically significant correlation between larger than normal body weight (OVW) and the presence of psychopathological symptoms and happiness scores. However, obesity (OBS) was linked with a higher score of somatization ($b_{std}=0.248$, b=3.665, p<0.001) and happiness, whereas somatization significantly mediated the relation of obesity and happiness ($b_{std}=0.197$, p=0.003).

Health status represented by the presence of a disease (BDD) and number of hospitalizations during last year (HSP) was found to significantly correlate with psychopathology symptoms. In particular,

Table 2. Psychopathological symptoms in study population: Deviation from normal values.

Scale	Present Study	Population*	t	p
	Mean (SD)	Mean (SD)		
SOM	*10.6 (6.3)*	*7.4 (7.1)*	*3.219*	*0.001*
OC	9.0 (4.0)	9.5 (6.5)	0.987	0.325
IS	8.4 (4.5)	8.4 (6.2)	0.000	1.000
DEP	13.6 (7.1)	11.3 (8.8)	1.733	0.084
ANX	*5.3 (3.9)*	*7.3 (6.7)*	*3.966*	*0.000*
HOS	*3.6 (2.9)*	*5.1 (5.1)*	*5.271*	*0.000*
PAR	*2.8 (2.8)*	*6.1 (4.4)*	*13.651*	*0.000*
PSY	*8.3 (2.9)*	*6.1 (6.8)*	*5.757*	*0.000*
PHB	*4.1 (3.6)*	*2.5 (3.7)*	*5.140*	*0.000*
GSI	0.71 (0.3)	0.7 (0.6)	0.171	0.865

* Donias et al, 1991

M=mean, SD=standard deviation, SOM=somatization, OC=obsessive-compulsive, IS=interpersonal sensitivity, DEP=depression, ANX=anxiety, HOS= hostility, PHB=phobic anxiety, PAR=paranoid ideation, PSY=psychoticism, GSI=Global Severity Index. Significant differences are bold.

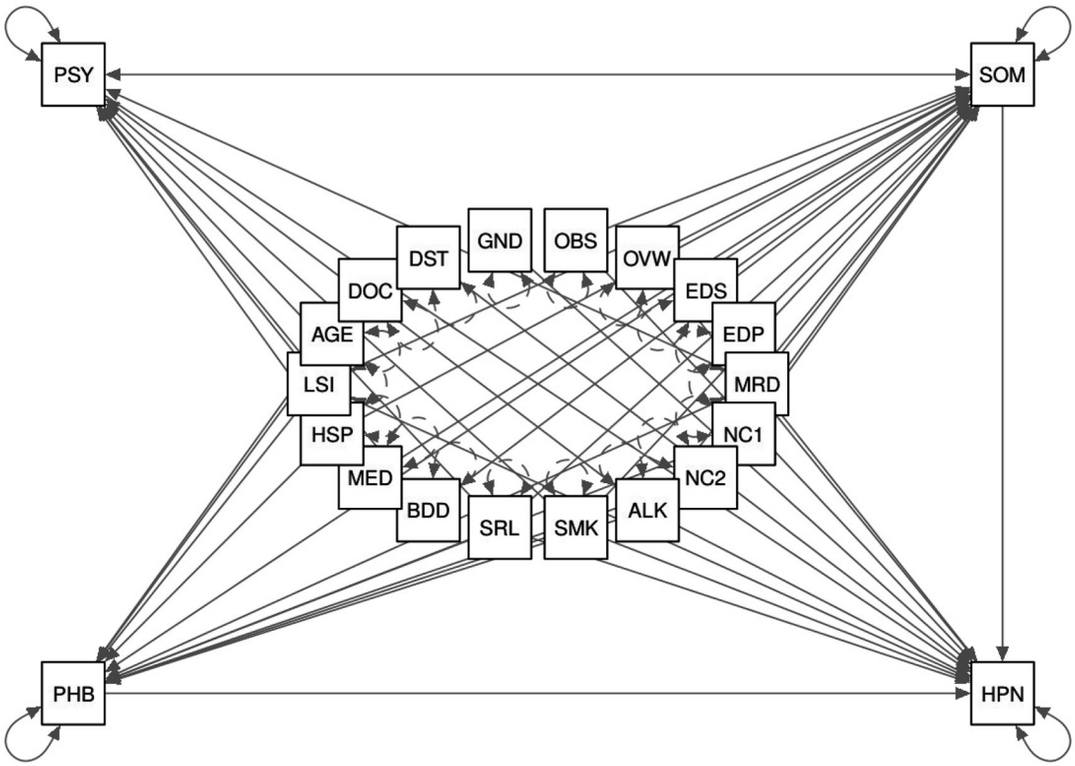

Figure 1. Theoretical model.
SOM=somatization, PSY=psychoticism, PHB=phobic anxiety, HPN=happiness, AGE=age, GND=gender, OBS=obesity, OVW=overweight, EDP=educational level primary, EDS=educational level secondary, MRD=married family status, NC1=income less than 500 €, NC2=income 500–1000 €, SRL=social relations, SMK=smoking, ALK= alcohol consumption, BDD=body disease, MED=medicine, DOC=number of visits at doctors, HSP=number of hospitalization, LSI=Stressful life events score.

a body illness (BDD) was found to correspond with higher scores of somatization (b_{std}=0.136, b=3.181, p=0.018), and psychoticism (b_{std}=0.195, b=2.032, p=0.002), while number of hospitalizations during last year (HSP) was found to correlate with somatization (b_{std}=0.161, b=0.933, p=0.012), phobic anxiety (b_{std}=0.224, b=0.515, p<0.001) and psychoticism (b_{std}=0.159, b=0.411, p=0.011). Similarly, the number of visits at doctors during last month (DOC) corresponded to higher score of phobic anxiety (b_{std}=0.272, b=0.649, p<0.001).

Married participants (MRD) were found to have lower scores in both psychopathology and happiness. More specifically, they were found to have lower scores of somatization (b_{std}=−0.229, b=−3.301, p=0.015), phobic anxiety (b_{std}=−0.396, b=−2.271, p<0.001) and psychoticism (b_{std}=−0.421, b=−2.711, p<0.001), while they also had lower levels of happiness (b_{std}=−0.340, b=−0.297, p<0.001).

Participants belonging in both low- and medium-income groups were found to have higher scores of both somatization and phobic anxiety. Moreover, frequent social activities were found to correspond to lower scores of somatization (b_{std}=−0.178, b=−3.163, p=0.005), phobic anxiety (b_{std}=−0.124, b=−0.873, p=0.031), psychoticism (b_{std}=−0.139, b=−1.103, p=0.025) and higher levels of happiness (b_{std}=0.131, b=0.141, p=0.046).

Regarding the direct effects of psychopathology on happiness, somatization was found to have a significant positive effect on happiness (b_{std}=0.246, b=0.015, p=0.001), while psychoticism corresponded to lower score on happiness (b_{std}=−0.314, b=−0.043, p<0.001). Finally, the total (direct and indirect)

Table 3. Path model's parameters (1).

		95% CI							
	Estimate	**Lower**	**Upper**	**Std. Err**	**z-value**	**p**	**Std. lv[(2)]**	**Std. all[(3)]**	**R^2**
SOM ~									0.278
	OBS	*3.665*	*1.850*	*5.480*	*0.926*	*3.959*	*0.000*	*3.665*	*0.248*
	OVW	0.844	–0.635	2.324	0.755	1.118	0.263	0.844	0.071
	EDS	–2.199	–5.131	0.732	1.496	–1.471	0.141	–2.199	–0.111
	EDP	*–3.637*	*–5.422*	*–1.853*	*0.910*	*–3.995*	*0.000*	*–3.637*	*–0.271*
	MRD	*–3.301*	*–5.962*	*–0.641*	*1.357*	*–2.432*	*0.015*	*–3.301*	*–0.229*
	NC1	*3.119*	*0.321*	*5.917*	*1.428*	*2.185*	*0.029*	*3.119*	*0.235*
	NC2	*2.986*	*0.810*	*5.162*	*1.110*	*2.690*	*0.007*	*2.986*	*0.248*
	ALK	0.370	–0.450	1.191	0.419	0.885	0.376	0.370	0.058
	SMK	0.025	–0.038	0.088	0.032	0.766	0.444	0.025	0.053
	SRL	*–3.163*	*–5.367*	*–0.958*	*1.125*	*–2.812*	*0.005*	*–3.163*	*–0.178*
	BDD	*3.181*	*0.557*	*5.804*	*1.339*	*2.376*	*0.018*	*3.181*	*0.136*
	MED	1.186	–0.250	2.622	0.733	1.619	0.106	1.186	0.092
	HSP	*0.933*	*0.209*	*1.656*	*0.369*	*2.527*	*0.012*	*0.933*	*0.161*
	LSI	–0.000	–0.015	0.015	0.008	–0.025	0.980	–0.000	–0.002
PHB ~									0.395
	AGE	*–0.100*	*–0.137*	*–0.063*	*0.019*	*–5.329*	*0.000*	*–0.100*	*–0.284*
	MRD	*–2.271*	*–3.243*	*–1.299*	*0.496*	*–4.580*	*0.000*	*–2.271*	*–0.396*
	NC1	*1.636*	*0.641*	*2.632*	*0.508*	*3.221*	*0.001*	*1.636*	*0.309*
	NC2	*2.272*	*1.508*	*3.036*	*0.390*	*5.828*	*0.000*	*2.272*	*0.474*
	SRL	*–0.873*	*–1.665*	*–0.081*	*0.404*	*–2.159*	*0.031*	*–0.873*	*–0.124*
	DOC	*0.649*	*0.400*	*0.897*	*0.127*	*5.122*	*0.000*	*0.649*	*0.272*
	HSP	*0.515*	*0.247*	*0.782*	*0.136*	*3.775*	*0.000*	*0.515*	*0.224*
	ALK	–0.139	–0.434	0.156	0.151	–0.924	0.355	–0.139	–0.055
	SMK	–0.005	–0.027	0.017	0.011	–0.456	0.648	–0.005	–0.028
	LSI	0.002	–0.004	0.007	0.003	0.577	0.564	0.002	0.037
PSY ~									0.267
	MRD	*–2.711*	*–3.606*	*–1.816*	*0.457*	*–5.937*	*0.000*	*–2.711*	*–0.421*
	SRL	*–1.103*	*–2.068*	*–0.139*	*0.492*	*–2.243*	*0.025*	*–1.103*	*–0.139*
	SMK	*0.033*	*0.006*	*0.059*	*0.014*	*2.435*	*0.015*	*0.033*	*0.158*
	BDD	*2.032*	*0.764*	*3.300*	*0.647*	*3.141*	*0.002*	*2.032*	*0.195*
	HSP	*0.411*	*0.096*	*0.726*	*0.161*	*2.555*	*0.011*	*0.411*	*0.159*
	ALK	0.351	–0.007	0.709	0.183	1.922	0.055	0.351	0.123
	LSI	–0.004	–0.010	0.003	0.003	–1.148	0.251	–0.004	–0.081
HPN ~									0.236
	OBS	*0.143*	*0.011*	*0.275*	*0.067*	*2.120*	*0.034*	*0.143*	*0.160*
	OVW	0.088	–0.015	0.191	0.052	1.680	0.093	0.088	0.121
	DST	–0.005	–0.009	0.000	0.002	–1.883	0.060	–0.005	–0.119
	GND	–0.103	–0.220	0.013	0.060	–1.735	0.083	–0.103	–0.143
	MRD	*–0.297*	*–0.439*	*–0.155*	*0.073*	*–4.091*	*0.000*	*–0.297*	*–0.340*
	SRL	*0.141*	*0.003*	*0.278*	*0.070*	*1.996*	*0.046*	*0.141*	*0.131*
	SMK	0.004	–0.001	0.008	0.002	1.694	0.090	0.004	0.126
	ALK	*–0.075*	*–0.130*	*–0.021*	*0.028*	*–2.720*	*0.007*	*–0.075*	*–0.194*
	SOM	*0.015*	*0.006*	*0.024*	*0.005*	*3.207*	*0.001*	*0.015*	*0.246*
	PHB	–0.011	–0.034	0.011	0.012	–0.972	0.331	–0.011	–0.074
	PSY	*–0.043*	*–0.061*	*–0.024*	*0.010*	*–4.417*	*0.000*	*–0.043*	*–0.314*
	LSI	*–0.001*	*–0.002*	*0.000*	*0.000*	*–2.888*	*0.004*	*–0.001*	*–0.206*

(1) TLI=0.942, NFI=0.895, NNFI=0.942, CFI=0.975, GFI=0.923, SRMR=0.023, RMSEA=0.034, (2) Dependent Variables are standardized, (3) Completely standardized solution (estimates of parameters if the variances are unity). SOM=somatization, PSY=psychoticism, PHB=phobic anxiety, HPN=happiness, AGE=age, GND=gender, OBS=obesity, OVW=overweight, EDP=educational level primary, EDS=educational level secondary, MRD=married family status, NC1=income less than 500 €, NC2=income 500–1000 €, SRL=social relations, SMK=smoking, ALK=alcohol consumption, BDD=body disease, MED=medicine, DOC=number of visits at doctors, HSP=number of hospitalization, LSI=The Holmes and Rahe stress inventory score

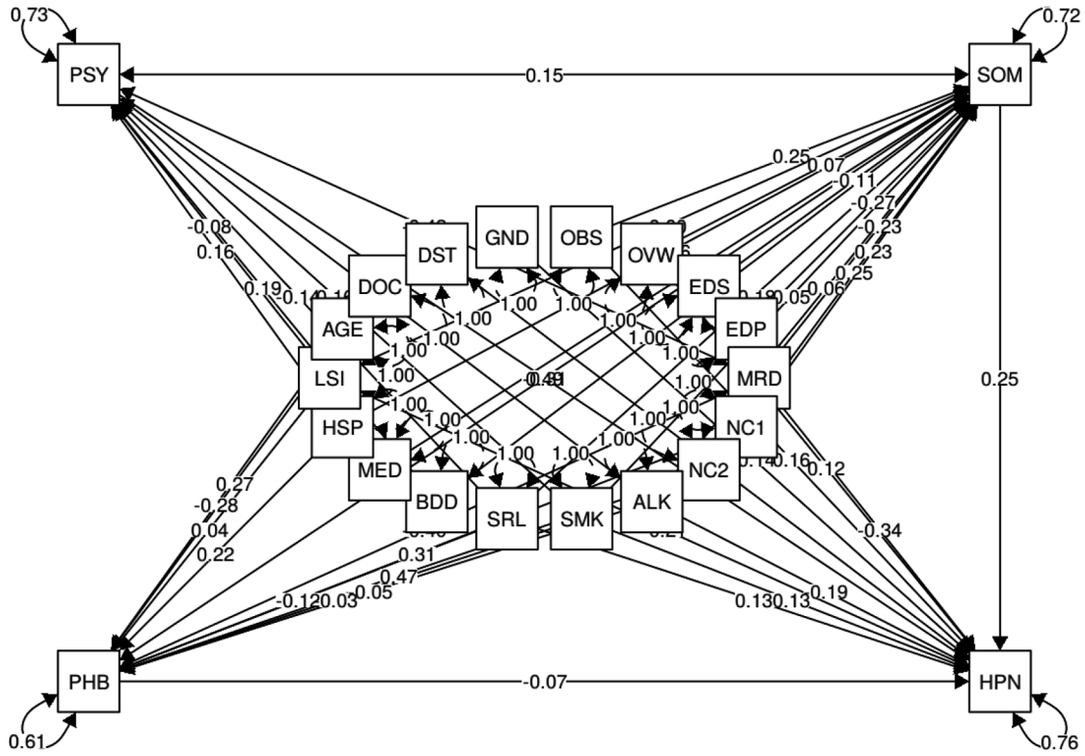

Figure 2. Path analysis results on the effect of socio-demographic factors on happiness having phobic anxiety, psychoticism and somatization as mediators. (Standardized estimates, N=199).
SOM=somatization, PSY=psychoticism, PHB=phobic anxiety, HPN=happiness, AGE=age, GND=gender, OBS=obesity, OVW=overweight, EDP=educational level primary, EDS=educational level secondary, MRD=married family status, NC1=income less than 500 €, NC2=income 500–1000 €, SRL=social relations, SMK=smoking, ALK=alcohol consumption, BDD=body disease, MED=medicine, DOC=number of visits at doctors, HSP=number of hospitalization, LSI=Stressful life events score

effect of income on happiness was not statistically significant (p=0.730). The above findings are summarized in the table 4.

Discussion

Overall, this study highlights the mediating role of specific psychopathological symptoms (as measured by the SCL-90) between socio-demographic characteristics and happiness in a sample of elderly regional residents in rural and remote areas. More specifically, the presence (or not) of somatization, phobic anxiety, and psychoticism was found to influence the various associations between happiness and socio-demographic factors (i.e. married status, obesity, low income, and poor social relations) in our target group.

At the same time, it shows the lack of correlation between stressful life events during the previous year of life (as measured by the Holmes and Rahe stress inventory) and the specific psychopathology symptoms of somatization, phobic anxiety, and psychoticism. Hence, it might be that psychic reactions and the later development of certain symptoms of psychopathology in this target group are affected by factors not measured in this study and not so much by recent stressful events in subjects' lives.

This study also found that most of the participants (84.9%) were happy or very happy with their lives in the village confirming previous reports that, regardless of age-related changes or declines in health or income, many older people are able to maintain their subjective happiness and well-being in later life.[29] Interestingly, married individuals were less happy with their lives compared to non-married ones.

The overall psychopathology distress of the participants, as was reflected in the general symptom index

Table 4. Effect of socio-demographic factors on psychometric scales.

Factor/Scale	SOM	PSY	PHB	HPN
Age (AGE)	ns	ns	↓	ns
Gender (GND)	ns	ns	ns	ns
Obesity (OBS)	↑	ns	ns	↑
Overweight (OVW)	ns	ns	ns	ns
Educational Level Primary (EDP)	↓	ns	ns	ns
Educational Level Second (EDS)	ns	ns	ns	ns
Married Family Status (MRD)	↓	↓	↓	↓
Income less than 500 € (NC1)	↑	ns	↑	ns
Income 500–1000 € (NC2)	↑	ns	↑	ns
Social relations (SRL)	↓	↓	↓	↑
Smoking (SMK)	ns	↑	ns	ns
Alcohol consumption (ALK)	ns	ns	ns	↓
Body disease (BDD)	↑	↑	ns	ns
Medicine (MED)	ns	ns	ns	ns
Number of visits at Doctors (DOC)	ns	ns	↑	ns
Number of hospitalization (HSP)	↑	↑	↑	ns
Stress score (LSI)	ns	ns	ns	↓
Somatization (SOM)				↑
Phobic Anxiety (PHB)				ns
Psychoticism (PSY)				↓

ns: not significant, HPN=happiness, SOM=somatization, PSY=psychoticism, PHB=phobic anxiety

(GSI), was not significantly higher than the typical Greek population. However, this finding was not reflected in the symptom subscales, a subset of which (anxiety, hostility, and paranoid ideation) differentiated in the opposite direction while others such as obsessive-compulsive, interpersonal sensitivity, and depression did not differentiate from the typical population scores. This is a finding which is partly in concordance with earlier reports showing that older people have lower anxiety scores.[30] Furthermore, the participants had above normal (compared to typical Greek population) somatization score, but not significantly higher depression score. This result suggests that the mechanisms underlying the two aspects of psychopathology might be different in nature and potentially supplies a new perspective to previous research, which considers somatization as a presentation of masked depression.[31]

The close interconnection between the presence of psychopathology and physical health status[19,20,32] is confirmed in our study. However physical health status was not found to correlate with the level of happiness the participants experience by living in a village, contrary to previous references suggesting that poor physical health significantly correlates with subjective happiness and well-being.[33]

The positive correlation between social activity and psychological health, which is routinely reported,[34–36] is confirmed in our study as well. Indeed, our results showed that lower frequency of social activity was correlated with higher scores of somatization, phobic anxiety, and psychoticism. These findings confirm the fact that social support is a protective factor; having friends or someone to confide in and being sociable in the community reduce the risk of psychopathological symptoms in the elderly.[11–13,15,37–39] In addition, we found that married individuals had lower scores of somatization, phobic anxiety, and psychoticism. These observations corroborated similar findings showing that marriage

may offer protection against depression,[6,7,10–13,40] anxiety,[4,17,41] and paranoid symptoms.[38] The correlation between lower income and poor mental health ratings which has been previously reported[5,10–12,15,37,42] is affirmed in our study also.

Stressful life events were identified as a factor having a negative influence on happiness, confirming previous research.[43] In contrast, the presence of distressing life events was not identified as a factor influencing the presence/development of somatization, psychoticism, and phobic anxiety symptoms, a result that differentiates from previous results.[44,45] This finding could lead future research towards the specification of the exact nature of these underlying factors.

Our study has two main limitations: the cross-sectional design of the study, which introduces an uncertainty about accepting causal relations, since the data were collected at one point in time, and the assumed linear relation among variables in the path model. Other limitations include the small sample size, the non-randomized sampling method, and the too regional character of the sample, thus our results limited in terms of generability. However, the representativeness of our sample should be considered as good for this study in view of the specific nature of the examined rural villages, alongside the old age of the participants. Future studies should be performed on larger populations in specific areas before general conclusions can be drawn at national level.

Acknowledging these caveats, our results provide primary care practitioners with a better understanding of the factors affecting psychological well-being of older people residing in remote villages, which, in turn, could help facilitate targeted interventions better tailored to their socio-demographic and psychopathologic profile.

Ικανοποίηση για τη ζωή και η συσχέτισή της με την ψυχοπαθολογία ηλικιωμένων που διαμένουν σε απομακρυσμένες περιοχές της Κρήτης

Ν. Νικολακάκης,[1] Ε. Δραγιώτη,[2] Ν. Παρίτσης,[1] Κ. Τσαμάκης,[3] Ν.Γ. Χριστοδούλου,[4] Ε.Ν. Ρίζος[3]

[1]Τομέας Ψυχιατρικής και Επιστημών Συμπεριφοράς, Ιατρική Σχολή, Πανεπιστήμιο Κρήτης, Ηράκλειο, Ελλάδα,
[2]Τομέας Ιατρικής και Επιστημών Υγείας, Ιατρική Σχολή, Πανεπιστήμιο Λινσέπινγκ, Λινσέπινγκ, Σουηδία,
[3]Β΄ Ψυχιατρική Κλινική Πανεπιστημίου Αθηνών, «Αττικόν» Νοσοκομείο Αθήνα, Ελλάδα,
[4]Τμήμα Ιατρικής Ψυχολογίας, Nottinghamshire Healthcare NHS Foundation Trust, Πανεπιστήμιο Nottingham Medical Chair, Παγκόσμια Ψυχιατρική Ένωση, Τμήμα Προληπτικής Ψυχιατρικής, Ην. Βασίλειο

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Ερευνητικές μελέτες έχουν δείξει ότι οι κοινωνικο-δημοσιογραφικοί παράγοντες και η ύπαρξη ψυχοπαθολογίας σχετίζονται με το επίπεδο ευτυχίας στην τρίτη ηλικία. Οι στόχοι της συγκεκριμένης συγχρονικής έρευνας ήταν: (1) να διερευνήσουμε το αποτέλεσμα της επίδρασης πρόσφατων στρεσογόνων γεγονότων ζωής και κοινωνικο-δημογραφικών παραγόντων στην ανάπτυξη ψυχοπαθολογίας σε ηλικιωμένους κατοίκους ορεινών και απομακρυσμένων περιοχών στην Κρήτη και (2) να διερευνήσουμε τον υποκείμενο μηχανισμό της σχέσης κοινωνικο-δημογραφικών παραγόντων και ψυχοπαθολογίας σε συνάρτηση με το επίπεδο ευτυχίας στην τρίτη ηλικία. Για την επίτευξη του στόχου αυτού χρησιμοποιήθηκαν οι εννέα διαστάσεις της ψυχοπαθολογίας με βάση την κλίμακα Symptom Checklist-90-R (SCL-90), ενώ η κλίμακα άγχους Holmes & Rahe χρησιμοποιήθηκε για την ποσοτικοποίηση των στρεσογόνων γεγονότων ζωής. Το δείγμα της παρούσας μελέτης αποτέλε-

σαν 205 ηλικιωμένοι άνδρες και γυναίκες (μέσος όρος ηλικίας: 77,1±6,7 χρόνια) που διαβιούν σε 10 ορεινά και απομακρυσμένα επαρχιακά χωριά στο νησί της Κρήτης. Η συλλογή των δεδομένων έγινε μέσω ερωτηματολογίων, που συμπληρώθηκαν σε ιδιαίτερες συναντήσεις με κάθε συμμετέχοντα ξεχωριστά, με τη βοήθεια του μελετητή που διενεργούσε τη συνέντευξη. Κάθε ερωτηματολόγιο περιείχε τις προαναφερθείσες κλίμακες καθώς και ερωτήσεις για ατομικά κοινωνικο-δημογραφικά χαρακτηριστικά των συμμετεχόντων. Η ανάλυση διακύμανσης χρησιμοποιήθηκε για την ανίχνευση κοινωνικο-δημογραφικών παραγόντων που εμφανίζουν στατιστικά σημαντική επίδραση στις διαστάσεις της ψυχοπαθολογίας. Στη συνέχεια, χρησιμοποιήθηκε ανάλυση διαδρομών για να ποσοτικοποιηθεί η έμμεση και άμεση επίδραση των επιλεγμένων κοινωνικο-δημογραφικών παραγόντων στην κλίμακα της ευτυχίας. Τα αποτελέσματα έδειξαν ότι τα στρεσογόνα γεγονότα ζωής δεν επηρεάζουν στατιστικά σημαντικά την ύπαρξη συγκεκριμένων συμπτωμάτων ψυχοπαθολογίας όπως η σωματοποίηση, ο ψυχωτισμός και το φοβικό άγχος. Ωστόσο, συγκεκριμένοι κοινωνικο-δημογραφικοί παράγοντες όπως η οικογενειακή κατάσταση, το κάπνισμα, το οικογενειακό εισόδημα, και οι κοινωνικές δραστηριότητες βρέθηκε να επηρεάζουν το επίπεδο ευτυχίας. Η συσχέτιση αυτή ποικίλλει ανάλογα με τον βαθμό ψυχο-συναισθηματικής έντασης. Τα αποτελέσματα αυτά υποδεικνύουν ότι η σωματοποίηση, ο ψυχωτισμός και το φοβικό άγχος είναι ψυχικές αντιδράσεις ανεξάρτητες από την προϋπαρξη πρόσφατων στρεσογόνων γεγονότων ζωής. Η μελέτη μας, παρόλο τον περιφερειακό της χαρακτήρα, μπορεί να συμβάλει στην ανάπτυξη κατάλληλων διαγνωστικών εργαλείων και παρεμβάσεων, βοηθώντας τους επαγγελματίες πρωτοβάθμιας περίθαλψης να προσεγγίσουν τους ηλικιωμένους κατοίκους απομακρυσμένων χωριών με ένα πιο κατάλληλο και ολοκληρωμένο τρόπο βελτιστοποιώντας έτσι την αποτελεσματικότητα των παρεμβάσεών τους.

Λέξεις ευρετηρίου: Ψυχική δυσφορία, στρεσογόνα γεγονότα ζωής, σωματοποίηση, ψυχωτισμός, φοβικό άγχος.

References

1. Karel MJ, Gatz M, Smyer MA. Aging and mental health in the decade ahead: what psychologists need to know. *Am Psychol* 2012, 67:184–198, doi: 10.1037/a0025393
2. Dragioti E, Levin LA, Bernfort L, Larsson B, Gerdle B. Insomnia severity and its relationship with demographics, pain features, anxiety, and depression in older adults with and without pain: cross-sectional population-based results from the PainS65+ cohort. *Ann Gen Psychiatry* 2017, 16:15, doi: 10.1186/s12991-017-0137-3
3. Hamilton S, Mills B, McRae S, Thompson S. Evidence to service gap: cardiac rehabilitation and secondary prevention in rural and remote Western Australia. *BMC Health Serv Res* 2018, 18:64, doi: 10.1186/s12913-018-2873-8
4. Wolitzky-Taylor KB, Castriotta N, Lenze EJ, Stanley MA, Craske MG. Anxiety disorders in older adults: a comprehensive review. *Depress Anxiety* 2010, 27:190–211, doi: 10.1186/s12913-018-2873-8
5. Grundy E, Sloggett A. Health inequalities in the older population: the role of personal capital, social resources and socio-economic circumstances. *Soc Sci Med* 2003, 56:935–947, PMID: 12593868
6. Schoevers RA, Beekman AT, Deeg DJ, Geerlings MI, Jonker C, Van Tilburg W. Risk factors for depression in later life; results of a prospective community based study (AMSTEL). *J Affect Disord* 2000, 59:127–137, PMID: 10837881
7. Beekman AT, Deeg DJ, van Tilburg T, Smit JH, Hooijer C, van Tilburg W. Major and minor depression in later life: a study of prevalence and risk factors. *J Affect Disord* 1995, 36:65–75, PMID: 8988267
8. Cornwell EY, Waite LJ. Social disconnectedness, perceived isolation, and health among older adults. *J Health Soc Behav* 2009, 50:31–48, PMID: 19413133
9. Boen H, Dalgard OS, Bjertness E. The importance of social support in the associations between psychological distress and somatic health problems and socio-economic factors among older adults living at home: a cross sectional study. *BMC Geriatr* 2012, 12:27, doi: 10.1186/1471-2318-12-27
10. Madianos MG, Gournas G, Stefanis CN. Depressive symptoms and depression among elderly people in Athens. *Acta Psychiatr Scand* 1992, 86:320–326, PMID: 1456076
11. Vink D, Aartsen MJ, Schoevers RA. Risk factors for anxiety and depression in the elderly: a review. *J Affect Disord* 2008, 106:29–44, doi: 10.1016/j.jad.2007.06.005
12. Djernes JK. Prevalence and predictors of depression in populations of elderly: a review. *Acta Psychiatr Scand* 2006, 113:372–387, doi: 10.1111/j.1600-0447.2006.00770.x
13. Blazer DG, Moody-Ayers S, Craft-Morgan J, Burchett B. Depression in diabetes and obesity: racial/ethnic/gender issues in older adults. *J Psychosom Res* 2002, 53:913–916, PMID: 12377303

14. Lavie CJ, Milani RV. Impact of aging on hostility in coronary patients and effects of cardiac rehabilitation and exercise training in elderly persons. *Am J Geriatr Cardiol* 2004,13:125–130, PMID: 15133415
15. Alexopoulos GS. Depression in the elderly. *Lancet* 2005, 365:1961–1970, PMID: 15936426
16. Skapinakis P, Bellos S, Koupidis S, Grammatikopoulos I, Theodorakis PN, Mavreas V. Prevalence and socio-demographic associations of common mental disorders in a nationally representative sample of the general population of Greece. *BMC Psychiatry* 2013, 13:163, doi: 10.1186/1471-244X-13-163
17. Gum AM, King-Kallimanis B, Kohn R. Prevalence of mood, anxiety, and substance-abuse disorders for older Americans in the national comorbidity survey-replication. *Am J Geriatr Psychiatry* 2009, 17:769–781, doi: 10.1097/JGP.0b013e3181ad4f5a
18. Ostling S, Skoog I. Psychotic symptoms and paranoid ideation in a nondemented population-based sample of the very old. *Arch Gen Psychiatry* 2002, 59:53–59, PMID: 11779282
19. Volkert J, Schulz H, Harter M, Wlodarczyk O, Andreas S. The prevalence of mental disorders in older people in Western countries - a meta-analysis. *Ageing Res Rev* 2013, 12:339–353, doi: 10.1016/j.arr.2012.09.004
20. Wijeratne C, Brodaty H, Hickie I. The neglect of somatoform disorders by old age psychiatry: some explanations and suggestions for future research. *Int J Geriatr Psychiatry* 2003, 18:812–819, doi: 10.1002/gps.925
21. Luber MP, Meyers BS, Williams-Russo PG, et al. Depression and service utilization in elderly primary care patients. *Am J Geriatr Psychiatry* 2001, 9:169–176, PMID: 11316621
22. Barefoot JC, Larsen S, von der Lieth L, Schroll M. Hostility, incidence of acute myocardial infarction, and mortality in a sample of older Danish men and women. *Am J Epidemiol* 1995, 142:477–484, PMID: 7677126
23. Parkes CM. Bereavement in adult life. *BMJ* 1998, 316:856–859, PMID: 9549464
24. Donias S, Karastergiou A, Manos N. Standardization of the symptom checklist-90-R rating scale in a Greek population Standardization of the symptom checklist-90-R rating scale in a Greek population. *Psychiatriki* 1991, 2:42–48
25. Derogatis LR. Symptom Checklist-90-Revised. Washington, DC: American Psychiatric Association, 2000
26. Holmes TH, Rahe RH. The Social Readjustment Rating Scale. *J Psychosom Res* 1967, 11:213–218, PMID: 6059863
27. Gerst MS, Grant I, Yager J, Sweetwood H. The reliability of the Social Readjustment Rating Scale: moderate and long-term stability. *J Psychosom Res* 1978, 22:519–523, PMID: 750662
28. Yves R. lavaan: An R Package for Structural Equation Modeling. *J Statistic Software* 2011, 48, doi:http://hdl.handle.net/10.18637/jss.v048.i02
29. Swift HJ, Vauclair CM, Abrams D, Bratt C, Marques S, Lima ML. Revisiting the paradox of well-being: the importance of national context. *J Gerontol B Psychol Sci Soc Sci* 2014, 69:920–929, doi: 10.1093/geronb/gbu011
30. Flint AJ. Epidemiology and comorbidity of anxiety disorders in the elderly. *Am J Psychiatry* 1994, 151:640–649, PMID: 8166303
31. Sheehan B, Banerjee S. Review: Somatization in the elderly. *Int J Geriatr Psychiatry* 1999, 14:1044–1049, PMID: 10607972
32. Cho J, Martin P, Margrett J, Macdonald M, Poon LW. The Relationship between Physical Health and Psychological Well-Being among Oldest-Old Adults. *J Aging Res* 2011, 2011:2041, doi: 10.4061/2011/605041
33. Gana K, Bailly N, Saada Y, Joulain M, Trouillet R, Hervı C, et al. Relationship between life satisfaction and physical health in older adults: a longitudinal test of cross-lagged and simultaneous effects. *Health Psychol* 2013, 32:896–904, doi: 10.1037/a0031656
34. Antonucci TC, Birditt KS, Webster NJ. Social relations and mortality: a more nuanced approach. *J Health Psychol* 2010, 15:649–659, doi: 10.1177/1359105310368189
35. Cohen S. Social relationships and health. *Am Psychol* 2004, 59:676–684, doi: 10.1037/0003-066X.59.8.676
36. Uchino BN, Cacioppo JT, Kiecolt-Glaser JK. The relationship between social support and physiological processes: a review with emphasis on underlying mechanisms and implications for health. *Psychol Bull* 1996, 119:488–531, PMID: 8668748
37. Fiske A, Wetherell JL, Gatz M. Depression in older adults. *Annu Rev Clin Psychol* 2009, 5:363–389, doi: 10.1146/annurev.clinpsy.032408.153621
38. Forsell Y, Henderson AS. Epidemiology of paranoid symptoms in an elderly population. *Br J Psychiatry* 1998, 172:429–432, PMID: 9747406
39. Henderson AS, Korten AE, Levings C, Jorm AF, Christensen H, Jacomb PA, et al. Psychotic symptoms in the elderly: a prospective study in a population sample. *Int J Geriatr Psychiatry* 1998, 13:484–492, PMID: 9695039
40. Papadopoulos FC, Petridou E, Argyropoulou S,Kontaxakis V, Dessypris N, Anastasiou A, et al. Prevalence and correlates of depression in late life: a population based study from a rural Greek town. *Int J Geriatr Psychiatry* 2005, 20:350–357, doi: 10.1002/gps.1288
41. McCabe L, Cairney J, Veldhuizen S, Herrmann N, Streiner DL. Prevalence and correlates of agoraphobia in older adults. *Am J Geriatr Psychiatry* 2006, 14:515–522, doi: 10.1097/01.JGP.0000203177.54242.14
42. Hernandez-Tejada MA, Frook G, Steedley M, Watkins J, Acierno R. Demographic-based risk of reporting psychopathology and poor health among mistreated older adults in the national elder mistreatment study wave II. *Aging Ment Health* 2018, 1–5, doi: 10.1080/13607863.2018.1509296
43. Krause N. Stressful events and life satisfaction among elderly men and women. *J Gerontol* 1991, 46:S84–S92, PMID: 1997586
44. Brown GW. Life events and affective disorder: replications and limitations. *Psychosom Med* 1993, 55:248–259, PMID: 8346333
45. Dohrenwend BP. The role of adversity and stress in psychopathology: some evidence and its implications for theory and research. *J Health Soc Behav* 2000, 41:1–19, PMID: 10750319

Corresponding author: N. Nikolakakis, Department of Psychiatry and Behavioral Sciences, Faculty of Medicine, University of Crete, GR-700 13 Heraklion, Crete Greece, Tel: (+30) 6977 992 513, e-mail: nmannikolakakis@hotmail.com

Research article
Ερευνητική εργασία

The role of acculturation attitudes and social support in anxiety and depression of Indian immigrants in Greece

E.V. Kateri,[1] G. Tsouvelas,[2] E.C. Karademas[3]

[1]Department of Psychology, University of Crete, Rethymno, Crete,
[2]Department of Nursing, University of West Attica,
[3]Department of Psychology, University of Crete, Crete, Greece

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In the present study, we examined factors that may impact immigrants' anxiety and depressive symptoms, focusing on the role of acculturation attitudes and social support. The participants of the present study were first generation Indian immigrants residing in Crete, Greece (N=114). Our first hypothesis was that Indian immigrants will choose two acculturation attitudes, namely integration and separation, as these may enable them maintain certain aspects of their culture of origin given their distinct differences from Greeks in religion, cultural values, and physical appearance. It was also hypothesized that integration and separation will be positively related to social support. Social support was also expected to mediate the negative relationship of separation and integration to anxiety and depression. Furthermore, social support was expected to act protectively for Indian immigrants who chose integration and separation, minimizing the levels of anxiety and depression (i.e., a moderation effect). Using specific measures for anxiety, depression, social support, and acculturation attitudes, the results showed that Indian immigrants report a greater preference for integration and separation. Separation was the only acculturation attitude positively related to social support and negatively to depression through social support from friends and family. Moreover, higher levels of social support seemed to protected immigrants who choose integration from depression and medium and high levels of social support protected immigrants who choose assimilation from anxiety. These findings indicate that both integration and separation are preferred by Indian immigrants in Greece. Moreover, it seems that in the case of Indian immigrants in Greece, separation could be related to more immigrants' social support than other acculturation attitudes, ending in turn to less depression symptoms. These findings demonstrate that different acculturation attitudes (i.e. assimilation, integration, separation) may have different effects on dis-

tinct psychological indices. Moreover, immigrants' social support is a protecting factor in the relationship between acculturation attitudes to anxiety and depression. The present study suggests that the increase of the immigrants' social networks could prove helpful for their adaptation to the Greek society.

Key words: Acculturation, anxiety, depression, social support, Indian immigrants.

Introduction

In recent decades, Greece has become one of the "recipient" countries of immigrants from the Balkans and several Asian countries.[1] Even though most findings suggest that immigrants in Greece prefer integration or assimilation over separation[2–4] which are related to lower levels of depression, the role of the acculturation attitudes of Indian immigrants in Greece and the social support they receive in anxiety and depression feelings has never been studied before. Less assimilated immigrants seem to experience in Attica more cultural dissonance and conflict with host culture,[5] but a crucial question remains: if it is feasible and adaptive for immigrants with many cultural differences from Greeks to become assimilated. Asians in general face more difficulties in their integration to Greek society because of their racial distinctness and differences in religion which makes Greeks more suspicious and distant.[6] For this reason, it is important to examine if Indians choose the same acculturation attitudes as Balkan immigrants (e.g. Albanians) and if the social support they receive affect their anxiety and depression feelings.

Acculturation refers to all those changes that arise when individuals and groups with different cultural backgrounds come into contact.[7] Most of the behavioral and cultural changes are observed in those immigrants that choose assimilation, that is defined as a lack of interest in maintaining their own cultural identity, and focusing on their daily interaction with other cultures.[8] On the other hand, fewer changes are observed in the case of separation, which is defined as the immigrants' tendency to be separated from the host country and to focus on their culture of origin. The integration strategy lies somewhere in the middle, as it facilitates the maintenance of fundamental cultural traits and, at the same time, enables the individual to participate in the wider social network, thus, combining both cultures.[8]

The acculturation attitudes that immigrants adopt are significant socio-cultural factors related to anxiety and depression. It seems that most immigrants prefer integration that is regarded as the most adaptive attitude, ending in less anxiety and depression symptoms.[8–11] Marginalization, on the other hand, represents the worst acculturation choice, because the person isolates himself from both hosts and co-nationals, while separation and assimilation lie somewhere in the middle, between integration and marginalization.[12]

However, when there is greater cultural distance and incompatible values between hosts and immigrants, psychological conflicts may arise, with elevated anxiety and depression symptoms.[10] Social support is regarded as a benefit of integration[13] and ameliorates the negative effects of acculturative stress on immigrants' anxiety and depression.[13–17] However, there are several studies in which immigrants prefer separation, which is related to a stronger connectedness with co-nationals and less anxiety and depression symptoms, in turn.[18–22] Separation seems to be preferred by those immigrants with distinguishing features and phenotypic differences from hosts[8,19–22] and to be associated positively with social support from family and friends.[23] Integration might also be adaptive for immigrants with distinct cultural values, as far as it enables the maintenance of fundamental cultural traits and emotional investment in both co-nationals and hosts,[24,25] ending, in turn, in less anxiety and depression symptoms.[4] Assimilation, on the other hand, alters cultural identity[24] and may endanger in-group relationships,[25] increasing conflicts with family, as immigrant cultural values and social be-

havior totally change. These conflicts, in turn, may lead to more anxiety and depression.[26]

The aim of the present study was to examine the interrelationship between acculturation attitudes of Indian immigrants in Greece, social support they receive, and anxiety and depression feelings. It was hypothesized that due to their racial distinctness and differences in religion[6] Indians would choose the acculturation attitudes of integration and separation over assimilation and marginalization. Integration, defined by Berry[10] as the interest in maintaining one's original culture and having daily interactions with other groups, could enable Indian immigrants to preserve some of their own cultural elements, while still participating in the wider social network, thus combining both cultural contexts. Alternatively, they may choose separation,[24] defined as preserving one's original culture and avoiding interaction with other groups. Both acculturation attitudes involve the preservation of immigrants' original cultural traits, even if represent different acculturation attitudes.[10] It was also expected that social support is going to be related positively to integration and separation. Furthermore, through social support (mediator), Indians who choose integration and separation are going to end in less anxiety and depression symptoms,[18–19,23] given that the maintenance of some fundamental cultural traits of their country of origin would not endanger in-group relationships.[25] Furthermore, it was also expected that social support would act protectively (i.e. moderation effect) for Indians who chose integration and separation,[27] minimizing depression and anxiety symptoms, given that social support ameliorates the negative effects of acculturation stress on immigrants' anxiety and depression.[13–17] The theoretical model of the present study is presented in figure 1.

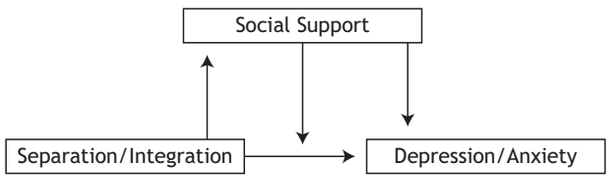

Figure 1. Hypothesized Model: Social support acts as mediator and moderator in the relationship between separation/integration and depression/anxiety.

Material and method

Participants

One hundred and fourteen (114) adult Indian immigrants in Greece participated in the study (see the samples characteristics in table 1). All participants were first generation Indian immigrants residing in Crete. Most participants were male (74.8%), married (77%), and unskilled workers (62.2%). As far as the sample's religion is concerned, the majority were Sikhs (81.3%).

Measures

Acculturation attitudes. Acculturation was measured with the Acculturation Attitudes Scale.[24] The scale consists of 20 items and assesses acculturation attitudes (i.e. assimilation, integration, separation and marginalization), in five domains of life: marriage, language, cultural traditions, social activities and friends. Participants respond on a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5). Cronbach's alpha for all scales are presented in table 1.

Depressive symptoms. Depression was assessed by the Center for Epidemiologic Studies - Depression scale (CES-D).[28] It consists of 20 questions and participants respond on a Likert-type scale ranging from "strongly disagree" (1) to "strongly agree" (5).

Anxiety symptoms. Anxiety was assessed by the State Anxiety Inventory.[29] For the present study it was used the translated form of the scale of Motti-Stefanidi et al.[30] It consists of 20 items and participants respond on a Likert-type scale ranging from "not at all" (1) to "very much" (4).

Social support. Social support was measured with the Significant Other's Scale.[31] It consists of four questions, which assess emotional support and practical support received by friends and spouse. Participants respond on a Likert-type scale ranging from 1 ("always") to 7 ("never").

Procedure and analyses

Adult Indian immigrants were recruited mainly in a building that they use for their religious ceremonies, using a convenience sampling technique. Each measure was translated into the Punjabi language from the English language and translated back to English[32] by the Department of Linguistic Studies at the Punjabi

Table 1. Means, Standard Deviations (SD) and Bivariate Correlations among Acculturation Attitudes, Social Support, Age, Education, Years of Residence, Depression and Anxiety.

	1	2	3	4	5	6	7	8	9	10
1. State Anxiety	– –									
2. CES-D	0.56**	– –								
3. Integration	0.12	–0.02	– –							
4. Assimilation	–0.06	0.14	0.32**	– –						
5. Separation	0.12	–0.12	–0.31**	0.01	– –					
6. Marginalization	0.11	0.30**	0.16	0.42**	–0.02	– –				
7. Social Support	–0.05	–0.23	–0.01	–0.17	0.40**	–0.11	– –			
8. Age	–0.15	–0.22*	0.04	–0.09	–0.23*	–0.05	0.07	– –		
9. Education	–0.11	0.21*	–0.01	–0.10	–0.15	–0.17	–0.10	–0.08	– –	
10. Years of Residence	–0.08	–0.01	–0.07	–0.05	–0.11	–0.08	0.07	0.51**	0.18	– –
Mean	41.5	17.4	18.8	10.2	16.6	9.90	21.3	33.2	11.2	7.73
SD	8.27	9.64	3.56	3.91	4.65	3.56	3.45	7.97	2.70	3.96
Cronbach's a	0.82	0.82	0.70	0.67	0.72	0.60	0.64	0.00	0.00	0.00

*p<0.05, **p<0.01

University. In order to examine the mediation effects of social support on the relation of acculturation attitudes to anxiety and depression, as well as the potential moderating effects of social support, a set of analyses were performed included in PROCESS, which is a freely-available computational tool for SPSS and SAS.[33,34] According to this approach, the indirect and moderation effects are significant at p<0.05 for the 95% bootstrap confidence intervals, when the derived intervals do not include values of zero.

Results

The means, standard deviations, and the bivariate correlation matrix of the variables included in this study are presented in table 1. First, a comparison was conducted between the factors of acculturation scale (i.e. means of integration, assimilation, separation, and marginalization). According to the results, the first preference seems to be for integration (M=18.8, SD=3.56). Separation was the second preference (M=16.6, SD=4.65), assimilation was the third (M=10.2, SD=3.91) and marginalization the last one (M=9.86, SD=3.56). Regarding the bivariate correlations between social support and acculturation attitudes, separation was the only acculturation attitude that was positively correlated to social support; integration, assimilation, and marginalization were not related to social support (table 1).

In order to examine the indirect relation of acculturation attitudes to anxiety and depression through social support (mediation), PROCESS[33,34] was used. The results indicated that social support mediated only the relationship between separation and depression and not the relationship between separation and anxiety. No mediation effect was found for the relationships between depression and integration, assimilation, and marginalization or between anxiety and integration, assimilation, and marginalization (table 2).

Next, PROCESS[33] was used to examine the moderation effects of social support. The relationship between integration and depression was significant only at the higher levels (+1 SD) of social support and the relationship between assimilation and anxiety was significant at the higher (+1 SD) and medium (M) levels of social support. No moderation effect of social support on anxiety and depression was found regarding separation and marginalization (table 3).

Discussion

The present study underscores the crucial role of social support in the relationship of Indian immigrants' acculturation attitudes with anxiety and depression. First, it was found that through social support (mediator), Indians who choose separation end in less de-

Table 2. The Indirect and Direct Effects of Acculturation Attitudes on Anxiety and Depression, through Social Support (Mediation).

					Bootstrapping			
					95% Confidence Intervals*			
	β	SE	p	R^2	Indirect effects		Direct effects	
					Lower	Upper	Lower	Upper
Dependent variable: Depression								
Integration	0.01	0.16	0.82	0.00	–0.19	0.45	–1.00	0.24
Assimilation	–0.06	0.10	0.47	0.00	–0.31	0.09	–0.94	0.59
Separation	–0.31	0.12	0.00	0.17	–0.77	–0.09	–0.50	0.63
Marginalization	0.04	0.08	0.52	0.00	–0.06	0.31	–0.42	0.96
Dependent variable: Anxiety								
Integration	0.00	0.09	0.89	0.00	–0.10	0.19	–0.73	0.59
Assimilation	0.03	0.07	0.06	0.14	–0.08	0.37	–1.60	–0.27
Separation	0.07	–0.03	0.11	0.05	–0.31	0.04	–0.37	0.78
Marginalization	0.02	0.06	0.16	0.04	–0.07	0.21	–0.97	0.49

*Bootstrapping bias corrected and accelerated (5,000 bootstrap samples). Indirect and direct effects are significant at $p<.05$ for the 95% bootstrap confidence intervals, when the derived intervals do not include values of zero

pressive symptoms. Secondly, social support minimizes Indians' anxiety and depression levels in the case of integration and assimilation. Social support is defined as the perception that someone is loved, cared for, estimated and that they belong to a wider social network with mutual assistance and obligations.[35] Family and friends are rated as two of the most significant sources of immigrants' social support and many newcomers rely more on friends and family to overcome settlement difficulties rather than on health and social service organizations.[36] Only one study in Greece so far, to our knowledge, has examined the role of social support in adult immigrants in Greece[37] and the present findings underscore its importance. Moreover, in future studies it should be further examined the interrelationship of social support and acculturation.

As expected, Indian immigrants in Greece showed a greater preference for integration and separation.[24] In the cases of separation, immigrants' tend to be separated from the host country and to focus on their culture of origin. In the case of integration, immigrants maintain their fundamental cultural traits and, at the same time, participate in the wider social network, thus, combining both cultures.[8] It is suggested that separation may not be incompatible with integration, in that a person may desire to keep contact with the majority while not considering it important to adopt the majority's culture.[38] Furthermore, both acculturation attitudes enable the maintenance of immigrants' fundamental cultural traits.[8] Although, integration was not related to social support in contrast to the study hypothesis,[8] a positive relationship of separation and social support was found. Given that separation enables the maintenance of cultural identity,[10,24] while integration may cause cultural changes that are incompatible with the Indian way of life, it is possible for family and friends to be more supportive for Indians who maintain their cultural identity than for Indians who behave differently from their cultural norms.[23,39] Namely, in future studies should be examined if the cultural changes of certain acculturation attitudes may cost to the individual its social exclusion from the co-ethnics.

Moreover, a negative relationship between separation and depression through social support was identified, indicating that Indians who choose separation receive more social support and end in less depression.[18,19,23,25] No mediation effect was found for

Table 3. Mean Indirect Effects (SE in Parentheses; Confidence Intervals in Brackets) of Acculturation attitudes on Depression and Anxiety, at Specific Values of Social Support (Moderation), and Confidence Intervals.

			Levels of Social Support		
	R^2	p	−1 SD [CI (95%)[a]]	M [CI (95%)[a]]	+1 SD[CI (95%)[a]]
Dependent variable: Depression					
Integration	0.11	0.00	−0.16 (0.29) [−0.75 to 0.42]	−0.58 (0.32) [−1.23 to 0.07]	−1.00 (0.44) [−1.90 to −0.10]
Separation	0.12	0.10	0.16 (0.50) [−0.84 to 1.16]	0.07 (0.30) [−0.53 to 0.68]	−0.00 (0.25) [−0.51 to 0.49]
Assimilation	0.06	0.30	0.19 (0.45) [−0.71 to 1.10]	−0.12 (0.35) [−0.84 to 0.58]	−0.45 (0.50) [−1.46 to 0.55]
Marginalization	0.08	0.32	0.67 (0.59) [−0.46 to 1.81]	0.16 (0.36) [−0.57 to 0.90]	−0.34 (0.60) [−1.54 to 0.85]
Dependent variable: Anxiety					
Integration	0.03	0.41	0.08 (0.29) [−0.51 to 0.68]	−0.20 (0.32) [−0.85 to 0.44]	−0.49 (0.42) [−1.34 to 0.35]
Separation	0.01	0.88	0.30 (0.49) [−0.68 to 1.29]	0.22 (0.32) [−0.42 to 0.88]	0.15 (0.31) [−0.47 to 0.78]
Assimilation	0.17	0.04	−0.54 (0.42) [−1.40 to 0.30]	−0.96 (0.34) [−1.65 to −0.27]	−1.38 (0.51) [−2.42 to −0.34]
Marginalization	0.01	0.94	−0.23 (0.46) [−1.16 to 0.69]	−0.24 (0.47) [−1.20 to 0.72]	−0.24 (0.71) [−1.69 to 1.19]

Note: SD=standard deviation, CI=confidence intervals. a Bootstrapping bias corrected and accelerated (5,000 bootstrap samples). Indirect and direct effects are significant at $p<0.05$ for the 95% bootstrap confidence intervals, when the derived intervals do not include values of zero. Bias corrected and accelerated.

anxiety. Anxiety may be related to factors that were not measured in the present study, such as stress coping mechanisms.[9,11,40] Furthermore, as expected, high levels of social support moderated the relationship of integration to depression. High social support protected Indians who chose integration from depression emphasizing the importance of social networks from co-nationals and hosts.[8–11] However, contrary to the study hypothesis, immigrants with higher and medium levels of social support who chose assimilation (and not separation) were protected from anxiety. A possible explanation could be that when immigrants receive in-group social support, assimilation may facilitate the implementation of their personal goals and ambitions, such as getting a better job or gaining more money in mainstream society,[8,41] thus minimizing anxiety levels.[42]

In conclusion, our findings suggest that separation, integration and assimilation are neither beneficial nor detrimental for immigrants' psychological health. Interactions between variables are the key to understand immigrants' behavior and health. The interaction of social support with acculturation attitudes needs to be further examined. These findings, also, demonstrate that different acculturation attitudes (i.e. assimilation, integration) may have different effects[8,43,44] on distinct psychological indices (i.e. anxiety, depression). Gonidakis et al[4] found that more assimilation strategies are related to lower levels of depression in the Attica region. Furthermore, as mentioned before, according to Prapas and Mavreas,[5] less assimilated immigrants in Attica experience more cultural dissonance and conflict with host culture, especially in societies with assimilation pressures toward immigrants. However, our study found that in rural areas of Greece, the maintenance of cultural heritage of immigrants' origin (integration and separation) was associated with lower levels of depression. Factors such

as ethnicity, as suggested by Gonidakis et al,[4] cultural differences between western and Asian immigrants, as suggested by Kateri and Karademas,[45] living area (urban or rural) and the host community acculturation preferences[5,46,42] could contribute to the interpretation of the aforementioned findings.

In the present study a convenience sample and a relatively small one was used. Longitudinal studies in many immigrant groups are needed to advance our theoretical understanding for the benefits of social support in different acculturation contexts. Immigrants in Greece are not a homogenous group and the generalizations from one group to another should be avoided. There is the possibility that, for immigrants who are markedly different from Greeks, such as Indians, separation could offer some benefits that should be examined in future studies. Counselors may, also, find it fruitful to explore with Indian clients the advantages and disadvantages of each acculturation choice, and to reinforce relationship bonds as an effective mechanism towards reducing loneliness and psychological dysfunction. Furthermore, it is important to note that social support, like other aspects of behavior, takes place within a cultural and a social context and the decision to ask for it, as well as the specific type of social support that is asked for, is affected by cultural values that must be explored in counseling or psychotherapy. In some cases, for example, sharing problems or other forms of "actual" social support might burden others and endanger close relationships. Counselors should be aware that sometimes "actual" social support is not the only helpful form of support and that perceived social support may be equally useful than actual support. Therefore, if the client hesitates to ask for emotional or practical help during stressful periods, the counselor may be useful by helping them acknowledged that there are actually people who do care about them regardless of their choice to or not ask for help. Cultural norms regarding the differences in social support are usually resistant to change, but the perception that someone is loved and cared for may reduce stress and loneliness on its own.[37]

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Ο ρόλος των στρατηγικών επιπολιτισμού και της κοινωνικής στήριξης στο άγχος και στην κατάθλιψη Ινδών μεταναστών στην Ελλάδα

Ε.Β. Κατέρη,[1] Γ. Τσουβέλας,[2] Ε.Χ. Καραδήμας[3]

[1]Τμήμα Ψυχολογίας, Πανεπιστήμιο Κρήτης, Ρέθυμνο, Κρήτη,
[2]Τμήμα Νοσηλευτικής, Πανεπιστήμιο Δυτικής Αττικής,
[3]Τμήμα Ψυχολογίας, Πανεπιστήμιο Κρήτης, Κρήτη

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Στην παρούσα έρευνα εξετάστηκαν οι παράγοντες που επηρεάζουν την ψυχική υγεία των μεταναστών, εστιάζοντας στον ρόλο των στρατηγικών επιπολιτισμού και της κοινωνικής στήριξης. Οι συμμετέχοντες της παρούσας έρευνας ήταν Ινδοί μετανάστες πρώτης γενιάς που διέμεναν στην Κρήτη (N=114). Διατυπώθηκε η υπόθεση ότι οι Ινδοί μετανάστες επιλέγουν την εναρμόνιση και τον διαχωρισμό, ως τακτικές επιπολιτισμού, δεδομένου ότι οι Ινδοί φέρουν διακριτές διαφορές από τους Έλληνες σε θρησκεία, πολιτισμικές αξίες και εμφάνιση, και η εναρμόνιση και ο διαχω-

ρισμός θα τους επέτρεπε να διατηρήσουν κάποια στοιχεία από τον πολιτισμό καταγωγής τους. Διατυπώθηκε, επίσης, η υπόθεση ότι η κοινωνική στήριξη θα δρα διαμεσολαβητικά στην αρνητική σχέση του διαχωρισμού και της εναρμόνισης με το άγχος και την κατάθλιψη. Επιπρόσθετα, διατυπώθηκε η υπόθεση ότι η κοινωνική στήριξη θα δρα προστατευτικά (δηλαδή θα δρα ως ρυθμιστής) στους Ινδούς μετανάστες που επιλέγουν την εναρμόνιση και τον διαχωρισμό, ελαττώνοντας τα επίπεδα άγχους και κατάθλιψης. Χρησιμοποιώντας συγκεκριμένες κλίμακες μέτρησης του άγχους, της κατάθλιψης, της κοινωνικής στήριξης και του επιπολιτισμού, τα αποτελέσματα έδειξαν ότι, όντως, οι Ινδοί μετανάστες επέλεξαν με μεγαλύτερη συχνότητα την εναρμόνιση και τον διαχωρισμό. Ο διαχωρισμός ήταν, επίσης, η μόνη τακτική επιπολιτισμού που συνδέονταν θετικά με την κοινωνική στήριξη και αρνητικά με την κατάθλιψη μέσω κοινωνικής στήριξης από φίλους και οικογένεια. Επιπλέον, τα υψηλά επίπεδα κοινωνικής στήριξης προστάτευαν τους μετανάστες που επέλεξαν την εναρμόνιση από την κατάθλιψη, ενώ τα μεσαία και υψηλά επίπεδα της αφομοίωσης από το άγχος. Τα αποτελέσματα αυτά υποδεικνύουν ότι και η εναρμόνιση και ο διαχωρισμός προτιμώνται από τους Ινδούς μετανάστες στην Ελλάδα. Επιπλέον, φαίνεται ότι στην περίπτωση των Ινδών μεταναστών την Ελλάδα, ο διαχωρισμός μπορεί να προσφέρει περισσότερη κοινωνική στήριξη σε σύγκριση με άλλες τακτικές επιπολιτισμού, έχοντας ως αποτέλεσμα λιγότερα συμπτώματα κατάθλιψης. Αυτά τα αποτελέσματα υποδεικνύουν ότι διαφορετικές τακτικές επιπολιτισμού μπορεί να έχουν διαφορετικά αποτελέσματα σε διακριτούς δείκτες ψυχικής υγείας. Επιπλέον, αναδεικνύεται ότι η κοινωνική στήριξη των μεταναστών αποτελεί προστατευτικό παράγοντα στη σχέση μεταξύ τακτικών επιπολιτισμού, άγχους και κατάθλιψης. Η αύξηση των κοινωνικών δικτύων των μεταναστών μπορεί να αποβεί χρήσιμη στην προσαρμογή τους στην ελληνική κοινωνία.

Λέξεις ευρετηρίου: Επιπολιτισμός, άγχος, κατάθλιψη, κοινωνική στήριξη, Ινδοί μετανάστες.

References

1. Baldwin-Edwards M, Kyriakou G, Kakalika P, Katsios G. *Statistical data on immigrants' in Greece*. A study conducted for ΙΜΕΠΟ [Migration Policy Institute]. Greece Mediterranean Migration Observatory 2004 (Cited 15 November 2004). Available from www.researchgate.net/profile/Ioannis_Katsios/publication/274373570_Statistical_Data_on_Immigrants_in_Greece_An_Analytic_Study_of_Available_Data_and_Recommendations_for_Conformity_with_European_Union_Standards/links/551c3c270cf2fe6cbf7839b7.pdf
2. Georgas J, Papastulianou A. *Acculturation of Pontic-Greek and Northern-Epirus Greek in Greece*. General Secretary of Migrant Greeks, Athens, 1993
3. Motti-Stefanidi F, Dalla M, Papathanasiou A, Takis N, Pavlopoulos V. Ethnic identity, acculturation strategies and psychological strength of immigrant/ repatriates students. In: Kordoutis P Pavlopoulos V (eds) *Research Fields in Social Psychology*. Atrapos, Athens, 2006
4. Gonidakis F, Korakakis P, Ploumpidis D, Karapavlou D-A, Rogakou E, Madianos MG. The relationship between acculturation factors and symptoms of depression: A cross-sectional study with immigrants living in Athens. *Transcultural Psychiatry* 2011, 48:437–454, doi:10.1177/1363461511408493
5. Prapas C, Mavreas V. The Relationship Between Quality of Life, Psychological Wellbeing, Satisfaction with Life and Acculturation of Immigrants in Greece. *Cult Med Psychiatry* 2018, 43:77–92, doi: 10.1007/s11013-018-9598-3
6. Markoutsoglou M, Kassou M, Mosxobos A, Ptoxos C. *Asian immigrants in Greece*. Department of Asian Studies, Athens, 2007
7. Sam DL. Acculturation: conceptual background and core components. In: Sam D, Berry JW (eds) *The Cambridge Handbook of Acculturation Psychology*. University Press, Cambridge, 2006
8. Berry JW. Immigration, Acculturation, and Adaptation. *Appl Psychol* 1997, 46:5–34, doi:10.1111/j.1464-0597.1997.tb01087.x
9. Berry JW. Acculturation and Adaptation in a New Society. *Int Migr* 1992, 30:69–85, doi:10.1111/j.1468-2435.1992.tb00776.x
10. Berry JW. Stress perspectives on acculturation. In: Sam DL, Berry JW (eds) *The Cambridge Handbook of Acculturation Psychology*. Cambridge University Press, Cambridge, 2006, doi:10.1017/cbo9780511489891.007
11. Berry JW, Kim U, Minde T, Mok D. Comparative Studies of Acculturative Stress. *Int Migr Rev* 1987, 21:491–511, doi:10.2307/2546607
12. Berry JW, Sabatier C. Variations in the assessment of acculturation attitudes: Their relationships with psychological wellbeing. Int *J Intercult Rel* 2011, 35:658–669, doi:10.1016/j.ijintrel.2011.02.002
13. Crockett LJ, Iturbide MI, Torres Stone RA, McGinley M, Raffaelli M, Carlo G. Acculturative stress, social support, and coping: Relations to psychological adjustment among Mexican American college students. *Cultur Divers Ethnic Minor Psychol* 2007, 13:347–355, doi:10.1037/1099-9809.13.4.347
14. Lee J-S, Koeske GF, Sales E. Social support buffering of acculturative stress: a study of mental health symptoms among Korean international students. *Int J Intercult Rel* 2004, 28:399–414, doi:10.1016/j.ijintrel.2004.08.005
15. Noh S, Kaspar V. Perceived Discrimination and Depression: Moderating Effects of Coping, Acculturation, and Ethnic Support. *Am J Public Health* 2003, 93:232–238, doi:10.2105/ajph.93.2.232

16. Finch BK, Vega WA. Acculturation stress, social support, and self-rated health among Latinos in California. *J Immigr Health* 2003, 5:109–117, doi:10.1023/A:1023987717921 2003
17. *Oppedal B, Røysamb E, Sam DL*. The effect of acculturation and social support on change in mental health among young immigrants. *Int J Behav Dev* 2004, 28:481–494, doi:10.1080/01650250444000126
18. Safdar S, Lay C, Struthers W. The Process of Acculturation and Basic Goals: Testing a Multidimensional Individual Difference Acculturation Model with Iranian Immigrants in Canada. *Appl Psychol* 2003, 52:555–579, doi: 10.1111/1464-0597.00151
19. Jasinskaja-Lahti I, Liebkind K, Horenczyk G, Schmitz P. The interactive nature of acculturation: perceived discrimination, acculturation attitudes and stress among young ethnic repatriates in Finland, Israel and Germany. *Int J Intercult Relat* 2003, 27:79–97, doi:10.1016/s0147-1767(02)00061-5
20. Branscombe NR, Schmitt MT, Harvey RD. Perceiving pervasive discrimination among African Americans: Implications for group identification and well-being. *J Pers Soc Psychol* 1999, 77:135–49, doi:10.1037/0022-3514.77.1.135
21. Cronin TJ, Levin S, Branscombe NR, van Laar C, Tropp LR. Ethnic identification in response to perceived discrimination protects well-being and promotes activism: A longitudinal study of Latino college students. *Group Process Intergroup Relat* 2011, 15:393–407, doi:10.1177/1368430211427171
22. Postmes T, Branscombe NR. Influence of long-term racial environmental composition on subjective well-being in African Americans. *J Pers Soc Psychol* 2002, 83:735–51, doi:10.1037/0022-3514.83.3.735
23. Hyman I, Dussault G. Negative consequences of acculturation on health behaviour, social support and stress among pregnant Southeast Asian immigrant women in Montreal: an exploratory study. *Can J Public Health* 2000, 91:357–360, PMID: 11089289
24. Berry JW, Phinney JS, Sam DL, Vedder P. Immigrant Youth: Acculturation, Identity, and Adaptation. *Appl Psychol* 2006, 55:303–332, doi:10.1111/j.1464-0597.2006.00256.x
25. Ferenczi N, Marshall TC. Meeting the expectations of your heritage culture. Links between attachment orientations, intragroup marginalization and psychological adjustment. *J Soc Pers Relat* 2014, 33:101–121, doi:10.1177/0265407514562565
26. Harker K. Immigrant Generation, Assimilation, and Adolescent Psychological Well-Being. *Soc Forces* 2001, 79:969–1004, doi:10.1353/sof.2001.0010
27. Madianos MG, Gonidakis F, Ploubidis D, Papadopoulou E, Rogakou E. Measuring Acculturation and Symptoms of Depression of Foreign Immigrants in the Athens Area. *Int J Soc Psychiatry* 2008, 54:338–349, doi:10.1177/0020764008090288
28. Radloff LS. The CES-D Scale. *Appl Psychol Meas* 1977, 1:385–401, doi:10.1177/014662167700100306
29. Spielberger GD, Gorush RL, Lushene RE. *The State-Trait Anxiety Inventory*. CA: Consulting Psychologists Press, Palo Alto, 1970
30. Motti-Stefanidi F, Pavlopoulos V, Obradović J, Dalla M, Takis N, Papathanasiou A et al. Immigration as a risk factor for adolescent adaptation in Greek urban schools. *Eur J Dev Psychol* 2008, 5:235–261, doi:10.1080/17405620701556417
31. Power MJ, Champion LA, Aris SJ. The development of a measure of social support: The Significant Others (SOS) Scale. *Br J Clin Psychol* 1988, 27:349–358, doi:10.1111/j.2044-8260.1988.tb00799.x
32. Brislin RW. Back-Translation for Cross-Cultural Research. *J Cross-Cult Psychol* 1970, 1:185–216, doi:10.1177/135910457000100301
33. Hayes AF. *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling*. 2012 (Cited Jully 2012). Available from www.afhayes.com/public/process2012.pdf
34. Hayes E. *An introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. 2nd ed. Guilford Press, New York, 2018
35. Taylor SE, Sherman DK, Kim HS, Jarcho J, Takagi K, Dunagan MS. Culture and social support: Who seeks it and why? *J Pers Soc Psychol* 2004, 87:354–362, doi:10.1037/0022-3514.87.3.354
36. Choi JB, Thomas M. Predictive factors of acculturation attitudes and social support among Asian immigrants in the USA. *Int J Soc Welf* 2009, 18:76–84, doi:10.1111/j.1468-2397.2008.00567.x
37. Kateri E, Karademas E. The interplay between self-construal, social support, and psychological adaptation of Indian immigrants' in Greece. *Eur J Counsell Psychol* 2018, 7:148–164, doi:10.5964/ejcop.v7i1.148
38. Snauwaert B, Soenens B, Vanbeselaere N, Boen F. When integration does not necessarily imply integration different conceptualizations of acculturation orientations lead to different classifications *J Cross-Cult Psychol* 2003, 34:231–239, doi:10.1177/0022022102250250
39. Tartakovsky E. Factors affecting immigrants' acculturation intentions: A theoretical model and its assessment among adolescent immigrants from Russia and Ukraine in Israel. *Int J Intercult Relat* 2012, 36:83–99, doi:10.1016/j.ijintrel.2011.02.003
40. Essau CA, Trommsdorff G. Coping with University-Related Problems. *J Cross-Cult Psychol* 1996, 27:315–328, doi:10.1177/0022022196273004
41. Phinney JS, Haas K. The Process of Coping Among Ethnic Minority First-Generation College Freshmen: A Narrative Approach. *J Soc Psychol* 2003, 143:707–726, doi:10.1080/00224540309600426
42. Greenman E, Xie Y. Is assimilation theory dead? The effect of assimilation on adolescent well-being. *Soc Sci Res* 2008, 37:109–137, doi:10.1016/j.ssresearch.2007.07.003
43. Triandis HC. Individualism-Collectivism and Personality. *J Pers* 2001, 69:907–924, doi:10.1111/1467-6494.696169
44. Ward C, Bochner S, Furnham A. *The psychology of culture shock*. Routledge, USA, 2001
45. Kateri E, Karademas E. The effect of self-construal in acculturation Albanians and Indian immigrants in Greece: The impact on mental health. *Psychology: The Journal of the Hellenic Psychological Society* 2018, 16: 302–20
46. Tsouvelas G, Pavlopoulos V. Greek host community acculturation expectations towards immigrants from Albania and Pakistan: The role of existential parameters. *Eur J Counsell Psychology* 2018, 7:181–199, doi:10.5964/ejcop.v7i1.151

Corresponding author: E.V. Kateri, Department of Psychology, University of Crete, (Gallos location), GR-741 00 Rethymno, Crete, Greece, Tel: (+30) 6932 235 868, e-mail: ekateri@gmail.com

Research article
Ερευνητική εργασία

Effects of anodal transcranial direct current stimulation on cognitive dysfunction in patients with progressive supranuclear palsy

A. Alexoudi,[1] P. Patrikelis,[1] S. Deftereos,[2] Th. Fasilis,[1] D. Karakalos,[3] A. Verentzioti,[1] St. Korfias,[1] D. Sakas,[1] St. Gatzonis[1]

[1]Department of Neurosurgery, National & Kapodistrian University of Athens, Evangelismos Hospital, Athens,
[2]Private Practice, Athens,
[3]Department of Neurology, Evangelismos Hospital, Athens, Greece

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Progressive supranuclear palsy (PSP) is a tauopathy characterized by motor, neurobehavioral and disabling brainstem deficits. No disease-modifying therapeutic options exist. The therapeutic potential of transcranial direct current stimulation (tDCS) has been highlighted in studies on patients with other neurodegenerative diseases. Therefore, by drawing upon the limited tDCS literature on PSP, we conducted a pilot study in order to evaluate the effect of tDCS over motor and premotor cortex in patients with PSP, with a particular emphasis on cognitive dysfunction. Eight patients affected by PSP were included (4 males and 4 females with mean age 67.4±7.4 years, range: 55–80 years and mean disease duration: 4.6±3.3 years, range: 1–11 years). The mean Unified Parkinson's Disease Rating Scale Part III (UPDRS III) was 49±16.1 and the mean Hoehn & Yahr (H&Y) scale was 3.9±1 at baseline. All pharmacological treatments (L-dopa, pramipexole, rotigotine, rasagiline, amantadine) were maintained stable during the study. We aimed at evaluating along with the motor outcome (as it is reflected on a disease-specific rating scale), the post-tDCS cognitive status after the completion of the intervention. The clinical evaluation involved the PSP-Rating Scale, the UPDRS III and the Timed Up and Go test. Neuropsychological assessment focused on auditory-verbal memory and learning, episodic memory, visuo-motor coordination and speed of information processing, executive functions and verbal fluency (phonemic and semantic). Anodal tDCS was applied over primary motor and pre-motor cortices in 10 daily sessions. During the tDCS stimulation a constant current of 2 mA was delivered for 30 minutes. Clinical evaluations were performed at baseline, day 11, day 30 and at day 90. The PSP-Rating score (total and sections I & III) improved significantly on day 11 compared to baseline and similarly on day 30. A positive effect was also seen on action tremor. In addition to the global mental status improvement, patients showed increases in neuropsychological performance in the domains of visuo-motor co-ordination and processing speed, auditory-verbal learning, episodic memory,phonological and semantic flu-

ency (access and retrieval from lexical memory, selective inhibition and lexical access speed). Our results suggest that tDCS has a beneficial effect on Progressive Supranuclear Palsy patients' bulbar and motor symptoms, cognitive dysfunction, as well as daily activities, which lasts beyond the duration of the treatment.

Key words: Progressive supranuclear palsy, transcranial direct current stimulation, motor function, neuropsychoogical dysfunction.

Introduction

Progressive supranuclear palsy (PSP) is a neurodegenerative parkinsonian disorder of tau protein aggregation. It is almost entirely sporadic, with a prevalence of 5–6 persons per 100,000, mean onset age of 63 and median survival of approximately 7 years.[1] The clinical spectrum of the disease is now known to be wider than originally described. Bradykinesia, postural instability, nuchal rigidity, frontal behavioral and cognitive changes, vertical gaze palsy, and other disabling brainstem deficits are some of the clinical features of PSP1. PSP is likely to present more diffuse prefrontal impairment as compared to Parkinson's disease (PD), with recent evidence showing prefrontal degeneration, beyond its known subcortical nuclei degeneration.[2] The diagnosis remains mainly clinical.

To date, no disease-modifying therapeutic options have been identified. The response to levodopa is transient and poor and treatment approaches focus on neurotransmitter replacement strategies with discouraging results.[1]

Transcranial direct current stimulation (tDCS) is a non-invasive and safe method of neuromodulation. Several studies highlight the therapeutic potential of tDCS in patients with neurological diseases including PD. Their results confirmed that tDCS application over the motor cortex had beneficial effect on bradykinesia and gait and postural control in advanced PD patients.[3–6]

In order to test the hypothesis that anodal tDCS could have beneficial effects in PSP we conducted an open label study without a control set-up. We applied the stimulation over primary motor and pre-motor cortices in 8 PSP patients. The aims of this study were the evaluation of the motor outcome as it is reflected on a disease-specific rating scale and the identification of the potential cognitive function outcome after the therapeutic sessions.

Material and method

Participants

Eight patients affected by PSP according to the current clinical criteria[7] were included in our study. The participants had no other relevant neurologic or psychiatric disease. Other exclusion criteria were implanted electrical medical device, such as a pacemaker, defibrillator, or deep brain stimulator; suspected or diagnosed epilepsy or other seizure disorder and pregnancy. The ethical committee of the Evangelismos Hospital approved the study and informed consent was obtained.

Instruments

All subjects underwent a clinical evaluation which involved the PSP-Rating Scale (PSP-RS)[8] which was used as the primary end point. This scale is divided in six sections: activities of daily living, behavior, bulbar, ocular motor, limb motor and gait.

The Unified Parkinson's Disease Rating Scale (UPDRS) III[9] and the Timed Up and Go test (TUG) (timed in seconds)[10] were also administrated. The time that the patient took to rise from an office chair with arms, walk three meters, turn around, walk back to the chair, and sit down was measured according to standard practice. Neurological evaluations also included the Schwab and England[11] and the Hoehn & Yahr[12] scales.

In order estimate cognitive functioning we used Mini Mental State Examination (MMSE) for a brief and raw assessment of the patient's general mental state.[13] Auditory-verbal memory and learning was estimated with Rey's Auditory Verbal Learning Test (RAVLT).[14] Visuo-motor activity and processing speed were evaluated with Digit Symbol Substitution Test-Wechsler Adult Intelligence (DSST-WAIS-III).[15] We

used Digit Span (Forward & Backward) to measure working memory and Trail Making Test (TMT-A) to assess concentration and visuo-motor activity.[15,16] Episodic memory has been evaluated by means of the Babcock Story Recall Test (BSRT)[17] while Verbal Fluency Test (Phonemic & Semantic) was also included to tap aspects of executive functions and language.[18]

Study Design/tDCS

Direct current was applied through a saline-soaked pair of surface sponge electrodes surface (35 cm^2) and delivered by a battery-driven, constant current stimulator (Sooma tDCSTM, Finland). During the tDCS stimulation a constant current of 2 mA was delivered for 30 minutes. To stimulate motor and premotor cortices the anode electrode was placed centrally across the scalp 8 mm anterior to Cz. Cathode was positioned over the right mastoid. tDCS was applied for 10 days over two weeks (Monday to Friday) with a weekend interval washout period.[19] Clinical evaluations were performed on day 0 (baseline), day 11, month 1 and month 3.

Statistics

Descriptive statistics were obtained for all parameters. Within group differences between baseline and follow-up values were compared by paired t-test. Comparisons were two-sided and $p<0.05$ was set as the level of statistical significance. All calculations were done in R version 3.5.1.

Study size

We calculated the required sample size based on the primary endpoint (PSP-R). Based on the published literature,[20] the minimum clinically important change in PSP-R over time is 5.7 and the anticipated standard deviation 3.7, which corresponds to an effect size Cohen d=1.51. Thus, the required sample size for a paired t-test to detect such a difference with a 0.8 power at a significance level of 0.05 is 6 patients.

Results

Patient demographics

Eight patients affected by PSP according to the current clinical criteria were included in our study; 4 males and 4 females with mean age 67.4±7.4 years, range: 55–80 years and mean disease duration: 4.6±3.3 years, range: 1–11 years. The mean Unified Parkinson's Disease Rating Scale Part III (UPDRS III) was 49±16.1 and the mean Hoehn & Yahr (H&Y) scale was 3.9±1 at baseline.

All pharmacological treatments (L-dopa, pramipexole, rotigotine, rasagiline, amantadine) were maintained stable during the study. The L-dopa equivalent dose was 738.5±235.6 mg.

Clinical outcome

PSP-Rating Scale total score was significantly decreased by 17.4% on day 11 and by 9% on month 1, compared to baseline (table 1). At the end of tDCS application all the patients reported a significant amelioration of dysarthria and dysphagia (PSP-RS III) ($p<0.05$). The therapeutic gain was retained for at least 1 month after the therapy. Significant improvement was noticed in daily activities (PSP-RS I) at day 11 and 1 month follow up visits ($p<0.05$).

Three out of the eight participants were not able to consummate the TUG evaluation. The disability due to the disease deteriorated after the 1st month in another patient. Therefore, we finally calculated TUG in 4 patients. The time required to complete the test was reduced by 31.3% compared to baseline at day 11, 32.8% at 1 month and 26.1 % at 3 months respectively (table 2). These results indicate a non-significant trend towards a reduction of TUG on follow up evaluations compared to baseline. We observed a 7% reduction of UPDRS total score on day 11 compared to baseline, which reached borderline statistical significance ($p=0.06$). This effect did not persist on months 1 and 3 (table 2). tDCS treatment exerted a significant reduction in action tremor (45.5%, $p<0.05$) at the end of the stimulation protocol (table 1).

No adverse events were reported.

Cognitive outcome

In the domain of auditory-verbal learning for not semantically organized material (lists of words) as measured by the RAVLT it has been showed an increase by 41.9% at day 11, by 30.7% at 1 month and later on in the course of the intervention a slight decrease by 22.8% at 3 months compared to baseline ($p<0.05$) though still maintaining therapeutic profits. There was a significant amelioration in the Phonemic

Table 1. The study outcomes during the 3 months follow- up (Mean +/– Standard Deviation).

	Baseline	11 days	1 month	3 months
PSP-RS (total)	47.6±16.3	39.3±13.1*	43.3±14.1*	45.1±15.3
PSP-RS-I	13.9±5.8	9.5±5.1*	11.3±5.5*	12.1±5
PSP-RS-II	0.5±1	0.4±0.7	0.4±0.7	0.6±1
PSP-RS-III	4.9±2.6	3.1±1.7*	3.4±2*	5±2.4
PSP-RS-IV	10.4±3.2	8.6±4	9.5±3.2	9.1±3.5
PSP-RS-V	7.4±3	7.8±2.8	7.6±3.2	8.1±3
PSP-RS-VI	11.1±7.1	10.3±6.4	11.5±6.2	11±6.6
UPDRS III	49±16.1	45.5±14.8	47.6±14.9	47.6±16.11
UPDRS rest tremor	0.4±1	0.5±1	0.3±0.7	0.1±0.4
UPDRS action tremor	1.1±1.1	0.6±0.9*	0.5±0.9	0.9±0.6
UPDRS rigidity	9±3.6	8.3±4.5	9.9±4	9±3.4
UPDRS upper bradykinesia	15.3±5.2	15±4.9	14.9±4.2	14.8±4.5
UPDRS leg agility	5.6±2	5.4±1.3	5.3±1.7	5.1±2
UPDRS-III-28	2.4±1.4	2.3±1.3	2.1±1.3	2.3±1.2
UPDRS-III-31	3±0.9	2.6±1	3±0.9	3.1±0.83
MMSE	23.0±5.4	26.2±3.5*	24.7±3.4	23.6±4.5
DSST-WAIS-III	17.2±9.1	21.6±10.8*	19.9±9.6	16.9±8.5
BSRT-immediate recall	8.7±2.6	10.0±2.7	9.1±2.4	7.7±2.3
BSRT- delayed recall	4.3±1.3	5.5±1.1	5.1±1.0	4.6±1.2
RAVLT	21.5±15.5	30.5±19.2*	28.1±18.6*	26.4±18.3*
Trail Making-A	234.0±81.5	217.0±98.7	211.3±103.9	220.2±95.5
Phonemic fluency	9.8±9.5	13.8±10.1*	13.8±10.8	12.7±10.1
Semantic fluency	15.3±10.9	17.4±12.0	19.3±10.8*	17.6±11.6

*Statistically significant changes compared to baseline at $p<0.05$
PSP-RS: PSP-Rating Scale, UPDRS: Unified Parkinson's Disease Rating Scale, MMSE: Mini Mental State Examination, DSST-WAIS-III: Digit Symbol Substitution Test-Wechsler Adult Intelligence Scale III, BSRT: Babcock Story Recall Test, RAVLT: Rey's Auditory Verbal Learning Test

fluency (access and retrieval of verbal information from lexical memory and selective inhibition) performance at the end of the tDCS application (increased performance by 40.8%), ($p<0.05$). Interestingly, we observed a significant therapeutic effect in the Semantic fluency test (executive function and access to semantic memory) during the 1 month visit too (table 1). Measures of verbal fluency assess the ability to retrieve specific information within restricted search parameters. Successful retrieval requires executive control over cognitive processes such as continuous updating, selective attention, selective inhibition, mental set shifting, internal response generation, and self-monitoring.[21]

Significant improvement was also observed in visuo-motor coordination and speed of information processing as measured by Symbol Coding-WAIS-III and in patients' global cognitive functioning as measured by MMSE (increase by 25.6% and 13.9% respectively). However, the positive effect was not maintained on the 1 and 3 months follow up evaluations (table 1). We noticed a reduction of BSRT scores (immediate and delayed recall of semantically organized verbal material) on day 11 and 1 month post-intervention which reached borderline statistical significance (table 1). Of no statistical significance were pre- and post-rehabilitation test performance in Trail Making-A (visual scanning and concentration).

Table 2. The TUG scores during the 3 months follow-up (time in seconds).

	Baseline	11 days	1 month	3 months
1	27	175	na	na
2	29	18	20	23
3	9	6.3	7.3	8.3
4	14	12.9	13.5	11.8
5	12.3	11.5	10.5	11.5
6	na	na	na	na
7	na	na	na	na
8	na	na	na	na
Average	18.26+/–9.1	13.24+/–4.8	12.1+/–1.5	10.5+/–.1,9

na: not available
TUG: Timed Up and Go test

Discussion

To our knowledge, the present study is the first to investigate the neuromodulation effects of anodal tDCS stimulation over the motor and pre-motor cortices in PSP patients' cognitive performance. Apart from our findings in motricity, meaning the improvement of PSP Rating Scale, in particular the bulbar function and the activities of daily living, as well as a post-tDCS effect on motor function as it reflected in UPDRS III and TUG performance, our PSP patients showed a post-tDCS neuropsychological improvement in the domains of visuo-motor coordination and processing speed (Symbol Coding-WAIS-III), auditory-verbal learning (RAVLT), episodic memory (BSRT immediate- and delayed -recall), phonemic fluency (access and retrieval of verbal information from lexical memory and selective inhibition), semantic fluency (executive function and access to semantic memory l, as well a global cognitive status improvement as suggested by the MMSE.

The improvement of dysarthria and dysphagia items is in line with a previous study.[22] Brusa et al, who employed cerebellar stimulation in PSP patients via 10 intermittent theta burst stimulation (TBS) sessions and reported amelioration of dysarthria symptoms. Interestingly, the authors,[22] reported a halting in paradoxical facilitation of cerebellar inhibition (CBI), probably counteracting pathological cerebellar inhibitory projections expected in these patients. The increased caudate nucleus' fMRI activivation as a consequence of thalamic stimulation is a possible explanation. Since caudate nucleus atrophy has been demonstrated in PSP,[23] tDCS stimulation likely promotes the induction of dopamine release in the caudate nucleus via the glutamatergic corticostriatal pathways, as has also been showed in animal studies.[24–26]

Current literature underlines the involvement of the cerebellum in PSP pathophysiology, while atrophy constitutes a common morphological finding encountered in the white and grey matter of the cerebellar peduncles. There is evidence that atrophy of specific grey matter regions correlates with postural instability and phonological changes, oculomotor deficits, affective and memory functions.[27] Besides cerebellar atrophy, PSP patients demonstrate significant gray matter volumetric reductions in both cortical and subcortical regions, including the frontal motor cortices, paralimbic (including anterior cingulate cortex and insula,) and lateral prefrontal cortices, superior temporal gyrus, striatum (putamen and caudate nucleus), thalamus and midbrain.[28] According to published studies there is evidence suggesting a tDCS modulating contribution on the functional connectivity of the corticostriatal and thalamo-cortical circuits in the human brain.[29]

The possible neuromodulating effects of tDCS on cortical excitability has raised interest in the application of the technique for the promotion of cognitive and executive function in either PSP or Multiple

System Atrophy (MSA) as it has been shown in the emerged studies of the last decade.[19,30]

Moreover, in the realm of psychopathology, since obesity is associated with decreased prefrontal cortex (DLPFC) activity, tDCS likely modifies cortical excitability and may facilitate improved control of eating. A recent study[31] emphasized the role played by left DLPFC in obesity and food intake and the potential application of anodal tDCS to facilitate weight loss.

The post-tDCS cognitive improvements are likely to reflect a functional improvement of both noradrenergic, glutaminergic, and dopaminergic neurotransmission leading to performance improvements in the domains of processing speed, memory and executive functions respectively, since PSP is likely to affect multiple neurotransmitter systems as a result of multiple sites of pathology.[32] It should be noted that memory disorders in PSP are seen as secondary (systemic) executively-induced disorders and as such not exclusively linked to cholinergic neurotransmission, as in the case of primary memory disorders.

The post-tDCS executive improvement seen in our patients, as reflected by improved verbal fluency performance, links to a possible functional upgrade of prefrontal cortex (PFC) since tDCS stimulation promotes dopamine release in the caudate nucleus, thus counterbalancing to some extend PSP-related gray matter loss of medio-lateral aspects of PFC.[33] Moreover, processing speed increases as suggested by patients' post-tDCS performance on Symbol Coding-WAIS-III, may strongly contribute to the observed post- tDCS phonological fluency improvement, since t processing speed is one of the many functional parameters f shaping phonological fluency performance.[34]

Episodic memory (BSRT) and auditory-verbal learning (RAVLT) post-tDCS increases may be interpreted in the light of a more general executive-frontal improvement (in terms of learning and retrieval strategies), since PSP is characterized by disruption of similar frontal-subcortical connections,[35] giving rise to executive-dependent (secondary) memory disorders, as well as other dysexecutive symptoms (e,g., apathy, working memory, reasoning, problem solving, conceptualization, planning, and social cognition deficits) strongly associated with frontal-executive dependent memory dysfunction.

By synthesizing all the pieces of evidence presented above, we hypothesize that the beneficial effect of tDCS that we observed in our patients was mediated by an improvement of the cerebello-thalamocortical functional connectivity.

Nevertheless, it has to be considered that changes in functional connectivity may not be strictly related to tDCS induced modulation of the cerebello-thalamocortical circuit. In PSP patients there is evidence of loss of cortical interneurons in the presupplementary motor area (SMA), primary motor cortex (M1) and motor thalamus,[36] resulting in the loss of γ-aminobutyric (GABA-A) intracortical inhibitory interneurons and possibly to a M1 disinhibition because of the reduced pallido-thalamic inhibitory input. Thus, tDCS may adjust resting membrane potentials mediated by changes in N-methyl-d-aspartate-receptor activation and GABAergic inhibition, as previously suggested.[37–40] Moreover, the tDCS long-term effects on motor performance as it was reflected in UPDRS III and TUG score could be a possible result of the stimulation and the induced M1 neuroplasticity. Of course, the relationship between dynamically interacting motor and cognitive circuitries connectivity should be addressed by future studies to disentangle the multifaceted nature of post-tDCS improvements.

Taking in to account that the minimal clinically important worsening on the PSPRS is 5.7 points, corresponding to the mean decline over 6 months,[20] our data suggest that tDCS might slow the progression of neurodegenerative process. Thus, tDCS in PSP appears to have a beneficial effect on motor (bulbar) and cognitive function which lasts beyond the duration of the treatment.

A main limitation of the present study is the open label design and the absence of a control group. Nevertheless, the conduction of an appropriate trial is difficult due to the rarity of the disease and, consequently, of the absence of optimal stimulation protocols with regard to the period of the therapy and the stimulation parameters (intensity, duration, repetition of treatment).

tDCS neuromodulation seems to be a promising therapy with a safe profile but larger randomized

controlled trials are needed to corroborate these encouraging results. Future research should address the putative interactions among motor and cognitive dysfunction parameters, since many cognitive domains share common cortico-subcortical circuitries with motor ones.

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Η επενέργεια της διακρανιακής διέγερσης συνεχούς ρεύματος στη νοητική δυσλειτουργία ασθενών με προϊούσα υπερπυρηνική παράλυση

Α. Αλεξούδη,[1] Π. Πατρικέλης,[1] Σπ. Δευτερέος,[2] Θ. Φασιλής,[1] Δ. Καράκαλος,[3] Α. Βερεντζιώτη,[1] Στ. Κορφιάς,[1] Δ. Σακάς,[1] Στ. Γκατζώνης[1]

[1]Α' Νευροχειρουργική Κλινική, Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Νοσοκομείο «Ο Ευαγγελισμός», Αθήνα,
[2]Ιδιωτικό Ιατρείο, Αθήνα,
[3]Νευρολογική Κλινική, Νοσοκομείο «Ο Ευαγγελισμός», Αθήνα, Ελλάδα

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Η προϊούσα υπερπυρηνική παράλυση είναι μια tau-πάθεια που χαρακτηρίζεται από κινητικές, νευροσυμπεριφορικές διαταραχές και στελεχιαία ελλείμματα. Δεν υπάρχουν νευροτροποποιητικές θεραπευτικές επιλογές. Οι θεραπευτικές δυνατότητες της διακρανιακής διέγερσης συνεχούς ρεύματος (transcranial direct current stimulation, tDCS) είναι γνωστές από μελέτες ασθενών με άλλα νευροεκφυλιστικά νοσήματα. Γι' αυτόν τον λόγο, ορμώμενοι από την περιορισμένη αρθρογραφία tDCS επί του επίμαχου κλινικού πληθυσμού, πραγματοποιήσαμε μία πιλοτική μελέτη με σκοπό να εκτιμήσουμε την επίδραση της εφαρμογής του tDCS στον κινητικό και προ-κινητικό φλοιό σε ασθενείς με Προϊούσα Υπερπυρηνική Παράλυση και με επικέντρωση στη νοητική δυσλειτουργία. Οκτώ ασθενείς με Προϊούσα Υπερπυρηνική Παράλυση συμμετείχαν στη μελέτη (4 άνδρες και 4 γυναίκες με μέση ηλικία 67,4±7,4 έτη, εύρος: 55–80 έτη και μέση διάρκεια νόσου: 4,6±3,3 έτη, εύρος: 1–11 έτη. Κατά την ένταξη στη μελέτη παρουσίαζαν μέση τιμή στην κλίμακα Unified Parkinson's Disease Rating Scale Part III (UPDRS III) ίση με 49±16,1 και στην κλίμακα Hoehn & Yahr (H&Y) ίση με 3,9±1 αντίστοιχα. Η φαρμακευτική αγωγή (L-dopa, pramipexole, rotigotine, rasagiline, amantadine) παρέμεινε σταθερή σε όλους τους ασθενείς κατά τη διάρκεια της μελέτης. Σκοπός της παρούσας μελέτης ήταν, πέραν της εκτίμησης του κινητικού αποτελέσματος, ο προσδιορισμός της πιθανής βελτίωσης της νοητικής λειτουργίας μετά τις θεραπευτικές συνεδρίες. Για την κλινική αξιολόγηση των κινητικών συμπτωμάτων χρησιμοποιήθηκαν οι κλίμακες PSP-Rating Scale, UPDRS III και Timed Up and Go test. Η νευροψυχολογική αξιολόγηση περιλάμβανε δοκιμασίες ακουστικής-λεκτικής μνήμης και μάθησης, μνήμης επεισοδίων, οπτικοκινητικής συνεργίας και ταχύτητας επεξεργασίας των πληροφοριών, προσοχής και επιτελικών λειτουργιών, λεκτική ροή (φωνημική και σημασιολογική). Ανοδική διακρανιακή διέγερση εφαρμόστηκε στον κινητικό και προ-κινητικό φλοιό των ασθενών για 10 συνεδρίες. Κατά τη διάρκεια της διέγερσης, εφαρμόστηκε συνεχές ανοδικό ρεύμα 2 mA για 30 λεπτά. Η κλινική εκτίμηση πραγματοποιήθηκε πριν την έναρξη της εφαρμογής, τις ημέρες 11, 30 και 90 μετά την εφαρμογή αντίστοιχα. Σημειώθηκε σημαντική βελτίωση στην κλίμακα PSP-Rating score (συνολικά και στις υποενότητες I & III) που αφορούσε στην ημέρα 11 και 30 συγκριτικά με τη θεραπευτική συνεδρία (μετρήσεις αφετηρίας). Επίσης, παρατηρήθηκε θετική θεραπευτική επενέργεια στον τρόμο ενεργείας.

Πέραν της σφαιρικής βελτίωσης της νοητικής κατάστασής τους, οι ασθενείς παρουσίασαν μετα-αποκαταστασιακή πρόοδο στον οπτικοκινητικό συντονισμό και την ταχύτητα επεξεργασίας των πληροφοριών, στην ακουστική-λεκτική μάθηση μη σημασιολογικά οργανωμένου υλικού και στη μνήμη επεισοδίων, στις επιτελικές λειτουργίες, στη συνειρμική φωνολογική και σημασιολογική λεκτική ροή (προσπέλαση και ανάσυρση πληροφοριών από τη λεξικολογική μνήμη, επιλεκτική αναστολή και ταχύτητα λεξικολογικής προσπέλασης). Τα αποτελέσματα μάς καταδεικνύουν τη θετική επίδραση της διακρανιακής διέγερσης συνεχούς ρεύματος στα προμηκικά και κινητικά συμπτώματα, επιμέρους νευροψυχολογικούς τομείς όπως την ταχύτητα επεξεργασίας, τη λεκτική μνήμη και τη μνήμη επεισοδίων, τις επιτελικές όψεις του λόγου (λεκτική ροή: ικανότητα προσπέλασης και ανάσυρσης πληροφοριών από τη λεξιλογική μνήμη), καθώς και στις καθημερινές δραστηριότητες των ασθενών με Προϊούσα Υπερπυρηνική Παράλυση. Το δε θεραπευτικό όφελος φαίνεται να διαρκεί και μετά το πέρας της νευροτροποποιητικής παρέμβασης.

Λέξεις ευρετηρίου: Προϊούσα υπερπυρηνική παράλυση, διακρανιακή διέγερση συνεχούς ρεύματος (tDCS), κινητική λειτουργία, νοητικές λειτουργίες.

References

1. Golbe LI. Progressive supranuclear palsy. *Semin Neurol* 2014, 34:151–159, doi: 10.1055/s-0034-1381736
2. Donker Kaat L, Boon AJ, Kamphorst W, Ravid R, Duivenvoorden HJ, van Swieten JC. Frontal presentation in progressive supranuclear palsy. *Neurology* 2007, 69:723–729, doi: 10.1212/01.wnl.0000267643.24870.26
3. Kaski D, Dominguez RO, Allum JH, Islam AF, Bronstein AM. Combining physical training with transcranial direct current stimulation to improve gait in Parkinson's disease: a pilot randomized controlled study. *Clin Rehabil* 2014, 28:1115–1124, doi:10.1177/0269215514534277
4. Benninger DH, Lomarev M, Lopez G et al. Transcranial direct current stimulation for the treatment of Parkinson's disease. *J Neurol Neurosurg Psychiatry* 2010, 81:1105–1111, doi: 10.1136/jnnp.2009.202556
5. Fregni F, Boggio PS, Santos MC, Lima M, Vieira AL, Rigonatti SP et al. Noninvasive cortical stimulation with transcranial direct current stimulation in Parkinson's disease. *Mov Disord* 2006, 21:1693–1702, doi: 10.1002/mds.21012
6. Kaski D, Allum JH, Bronstein AM, Dominguez RO et al. Applying anodal tDCS during tango dancing in a patient with Parkinson's disease. *Neurosci* Lett 2014, 568:39–43, doi: 10.1016/j.neulet.2014.03.043
7. Hφglinger GU, Respondek G, Stamelou M, Kurz C, Josephs KA, Lang AE et al. Clinical diagnosis of progressive supranuclear palsy: The movement disorder society criteria. *Mov Disord* 2017, 32:853–864, doi: 10.1002/mds.26987
8. Golbe LI, Ohman-Strickland PA. A clinical rating scale for progressive supranuclear palsy. *Brain* 2007,130:1552–65, doi: 10.1093/ brain/awm032
9. Goetz CG, Tilley BC, Shaftman SR, Stebbins GT, Fahn S, Martinez-Martin P et al. Movement Disorder Society-sponsored revision of the Unified Parkinson's Disease Rating Scale (MDS-UPDRS): scale presentation and clinimetric testing results. *Mov Disord* 2008, 23:2129–2170, doi: 10.1002/mds.22340
10. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc* 1991, 39:142–148, doi: 10.1111/j.1532-5415.1991.tb01616.x
11. Schwab RS, England AC. Projection Technique for Evaluating Surgery in Parkinson's Disease. In: Billingham FH, Donaldson MC (eds) *Third Symposium on Parkinson's Disease*. Churchill Livingstone, Edinburgh, 1969
12. Hoehn MM, Yahr MD. Parkinsonism: onset, progression and mortality. *Neurology* 1967,17:427–442, doi: 10.1212/wnl.17.5.427
13. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975,12:189–198, PMID:1202204
14. Messinis L, Nasios G, Mougias A, Politis A, Zampakis P, Tsiamaki E et al. Age and education adjusted normative data and discriminative validity for Rey's Auditory Verbal Learning Test in the elderly Greek population. *J Clin Exp Neuropsychol* 2016, 38:23–39, doi: 10.1080/13803395.2015.1085496
15. Lichtenberger EO. *Essentials of WAIS-IV assessment*. Wiley, Hoboken (NJ), 2009 Essentials of psychological assessment. KAS, Hoboken (NJ), 2009.
16. Zalonis I, Kararizou E, Triantafyllou NI, Kapaki E, Papageorgiou S, Sgouropoulos P et al. A normative study of the trail making test A and B in Greek adults. *Clin Neuropsychol* 2008, 22:842–850, doi: 10.1080/13854040701629301
17. Babcock H. An experiment in the measurement of mental deterioration. *Arch Psychol* 1930,117:105.
18. Kosmidis MH, Vlahou CH, Panagiotaki P, Kiosseoglou G. The verbal fluency task in the Greek population: normative data, and clustering and switching strategies. *J Int Neuropsychol Soc* 2004,10:164–172, doi: 10.1017/S1355617704102014
19. Alexoudi A, Patrikelis P, Fasilis T, Deftereos S, Sakas D, Gatzonis S. Effects of anodal tDCS on motor and cognitive function in a patient with multiple system atrophy. *Disabil Rehabil* 2018, 21:1–5, doi: 10.1080/09638288.2018.1510043
20. Hewer S, Varley S, Boxer AL, Paul E, Williams DR; AL-108-231 Investigators. Minimal clinically important worsening on the progressive supranuclear Palsy Rating Scale. *Mov Disord* 2016, 31:1574–1577, doi: 10.1002/mds.26694
21. Lezak MD, Howieson DB, Loring DW, Hannay HJ, Fischer JS. *Verbal functions and language skills*. Oxford University

Press, 2004. Neuropsychological Assessment. 4th ed. Oxford University Press, Oxford, 2004

22. Brusa L, Ponzo V, Mastropasqua C, Picazio S, Bonnμ S, Di Lorenzo F. Theta burst stimulation modulates cerebellar-cortical connectivity in patients with progressive supranuclear palsy. *Brain Stimul* 2014, 7:29–35, doi: 10.1016/j.brs.2013.07.003
23. Boelmans K, Holst B, Hackius M, Finsterbusch J, Gerloff C, Fiehler J. Brain iron deposition fingerprints in Parkinson's disease and progressive supranuclear palsy. *Mov Disord* 2012, 27:421–427, doi: 10.1002/mds.24926
24. Li Y, Tian X, Qian L, Yu X, Jiang W. *Anodal transcranial direct current stimulation relieves the unilateral bias of a rat model of Parkinson's disease*. Paper presented at 2011 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 30 August – 3 September 2011, Boston, Massachusetts, USA, Abstracts Book, 2011:765–768
25. Strafella AP, Paus T, Barrett J, Dagher A. Repetitive transcranial magnetic stimulation of the human prefrontal cortex induces dopamine release in the caudate nucleus. *J Neurosci* 2001, 21:RC157, PMID:11459878
26. Whitton PS. Glutamatergic control over brain dopamine release *in vivo* and *in vitro*. *Neurosci Biobehav Rev* 1997, 21:481–488, PMID:9195606
27. Gellersen HM, Guo CC, O'Callaghan C, Chen Z, Peng H, Xia K. Cerebellar atrophy in neurodegeneration - a meta-analysis. *J Neurol Neurosurg Psychiatry* 2017,88:780–788, doi: 10.1136/jnnp-2017-315607
28. Pan P, Liu Y, Zhang Y, Zhao H, Ye X, Xu Y. Brain gray matter abnormalities in progressive supranuclear palsy revisited. *Oncotarget* 2017, 8:80941–80955, doi: 10.18632/oncotarget.20895
29. Polania R, Nitsche MA, Paulus W. Modulating functional connectivity patterns and topological functional organization of the human brain with transcranial direct current stimulation. *Hum Brain Mapp* 2011, 32:1236–1249, doi: 10.1002/hbm.21104
30. Doruk D, Gray Z, Bravo GL, Pascual-Leone A, Fregni F. Effects of tDCS on executive function in Parkinson's disease. *Neurosci Lett* 2014, 582:27–31, doi: 10.1016/j.neulet.2014.08.043
31. Gluck ME, Alonso-Alonso M, Piaggi P, Weise CM, Jumpertz-von Schwartzenberg R, Reinhardt M et al. Neuromodulation targeted to the prefrontal cortex induces changes in energy intake and weight loss in obesity. *Obesity* 2015, 23:2149–2156. doi:10.1002/oby.21313
32. Rajput A, Rajput AH. Progressive supranuclear palsy: clinical features, pathophysiology and management. *Drugs aging* 2001,18:913–925, doi: 10.2165/00002512-200118120-00003
33. Paviour DC, Price SL, Jahanshahi M, Lees AJ, Fox NC. Longitudinal MRI in progressive supranuclear palsy and multiple system atrophy: rates and regions of atrophy. *Brain* 2006,129:1040–1049, doi: 10.1093/brain/awl021
34. Elgamal SA, Roy EA, Sharratt MT. Age and verbal fluency: the mediating effect of speed of processing. *Can Geriatr J* 2011, 14:66–72, doi: 10.5770/cgj.v14i3.17
35. Cordato NJ, Halliday GM, Caine D, Morris JG. Comparison of motor, cognitive, and behavioral features in progressive supranuclear palsy and Parkinson's disease. *Mov Disord* 2006, 21:632–638, doi: 10.1002/mds.20779
36. Halliday GM, Macdonald V, Henderson JM. A comparison of degeneration in motor thalamus and cortex between progressive supranuclear palsy and Parkinson's disease. *Brain* 2005, 128:2272–2280, doi: 10.1093/brain/awh596
37. Liebetanz D, Nitsche MA, Tergau F, Paulus W. Pharmacological approach to the mechanisms of transcranial DC-stimulation-induced after-effects of human motor cortex excitability. *Brain* 2002, 125:2238–2247, doi: 10.1093/brain/awf238
38. Paulus W, Classen J, Cohen LG, Large CH, Di Lazzaro V, Nitsche M et al. State of the art: Pharmacologic effects on cortical excitability measures tested by transcranial magnetic stimulation. *Brain Stimul* 2008,1:151–163, doi: 10.1016/j.brs.2008.06.002
39. Stagg CJ, Best JG, Stephenson MC, O'Shea J, Wylezinska M, Kincses ZT et al. Polarity-sensitive modulation of cortical neurotransmitters by transcranial stimulation. *J Neurosci* 2009, 29:5202–5206, doi: 10.1523/JNEUROSCI.4432-08.2009
40. Tanaka T, Takano Y, Tanaka S, Hironaka N, Kobayashi K, Hanakawa T et al. Transcranial direct-current stimulation increases extracellular dopamine levels in the rat striatum. *Front Syst Neurosci* 2013, 7:6, doi: 10.3389/fnsys.2013.00006

Corresponding author: A. Alexoudi, Department of Neurosurgery, National & Kapodistrian University of Athens, "Evangelismos" Hospital, 45–47 Ipsilantou street, GR-106 76 Athens, Greece, Tel: (+30) 6978 630 040, e-mail: alexoudath@yahoo.gr

Review
Ανασκόπηση

Empty-nest-related psychosocial stress: Conceptual issues, future directions in economic crisis

A. Bougea,[1,2] A. Despoti,[1] E. Vasilopoulos[3]

[1]1st Department of Neurology, University of Athens, Medical School, Eginition Hospital, Athens,
[2]Postgraduate Course Science of Stress and Health Promotion, School of Medicine, University of Athens,
[3]1st Department of Psychiatry, University of Athens, Eginition Hospital, Athens, Greece

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The empty-nest syndrome is a transitional stage, when middle-aged parents are in the process of encouraging their children to take up their obligations as adults. The empty-nest syndrome is a psychological condition that affects both parents, who experience feelings of grief, loss, fear, inability, difficulty in adjusting roles, and change of parental relationships, when children leave the parental home. This syndrome has gained special interest in a world where the current economic crisis has not only deepened global poverty but also a crisis of values reflected in the dynamic model of the family. The purpose of this review was to appraise the impact of psychosocial stress of the empty- nest syndrome on the parents' well-being through the years, during the current socio-economic crisis, taking into account gender, national and cultural background, socio-demographic and other context factors. We addressed the phenomenon of the "Boomerang Kids" and crowded nests as a result of current financial instability. Finally, we focused on the strategies which the family can employ to retain their resilience, according to the Transactional Model of Stress and Coping Family resilience framework and self-efficacy models. A literature review was conducted using web-based search engines provided by Medline, Scopus, Embase, Cochrane and PsychINFO. The term "empty nest syndrome'' was combined with women, men, economic crisis, parenthood, stress, menopause, midlife crisis, Boomerang kids, crowded nets, resilience, self-efficacy, well-being, and cultural differences. Women and men from diverse cultural groups have a different experience of the empty nest, as well as ways of coping. Distress caused by empty nest results in the incidence of symptoms of depression, behavioral symptoms and cognitive impairment. In most of studies, low marital quality and lack of social support affected negatively on a parent's well-being particularly for those experiencing the return of their "Boomerang kids". However, the financial crisis can transform an empty-nest into a "dynamic nest" by community health promotion services. Social support programs should be designed to strengthen family resource and improve family well-being.

Key words: Empty-nest syndrome, family, economic crisis, resilience, well-being.

Introduction

The empty-nest syndrome is a transitional stage experienced by middle-aged parents (45–65 years old) when their children leave home.[1] The percentage of empty-nest elderly (aged <60 years) ranged from 50–78% in different populations.[2,3] The empty-nest syndrome is characterized by feelings of sadness, loss, fear or difficulty in redefining roles with negative effects such as depression, alcoholism, identity crisis, and marital conflict.[4] However, there is also evidence that the empty nest can be a positive time for parents, an opportunity for reconnection and a time to rekindle interests.[5]

Despite these conflicting findings, evidence in recent years has shown that transition to the empty nest has undergone dramatic changes. Since the beginning of the global financial crisis in 2009, poverty has not only deepened significantly and unemployment has risen dramatically but also the crisis of values reflected in the dynamic model of family.[6] However, data are lacking on how empty nest parents redefine their new role in such situations.

The purpose of this first review was to analyze the definitions, historical and theoretical background of empty-nest syndrome through the main components of the parental role. We then proceeded to examine the effect of stress on the emotional health and well-being of empty nest parents taking into account gender, national and cultural differences. Furthermore, we examined the impact of the current economic crisis on empty-nest syndrome and strategies on how the family can retain their resilience.

Material and method

We conducted a review of original articles retrieved in Medline, Scopus, Embase, Cochrane and PsychINFO without time restriction. A literature review was conducted using web-based search engines provided by Medline, Scopus, Embase, Cochrane and PsychINFO. The term "empty-nest syndrome'' was combined with the words: women, men, economic crisis, parenthood, stress, menopause, midlife crisis, Boomerang kids, crowded nest, resilience, self-efficacy, well-being, cultural differences.

Definition, history and theoretical background

The term "empty-nest syndrome" owes its origin to the theory of role identity.[7] It describes the impact that the children's departure from the parental nest has on the welfare of the parents. According to this theory, which was most popular in the late 50s, the loss of a very important role brings alienation and loneliness and dissatisfaction.[7] The more roles one has, the less threatening the prospect of empty-nest syndrome.[8] However, this approach is based on the questionable assumption that the departure of children from the parental home also implies the simultaneous loss of the parental role, an assumption which researchers have generally rejected. It is thought that the parental role can change, or adapt to the new situation, but by no means can it be lost.[8]

The theoretical approach to the role change is associated with the study of Rahe and Holmes who have created a list of 43 events which are considered as sources of stress and require a degree of adaptation.[9] The child's departure from parental home is positioned at 23rd place, scoring 29 points.[9] Consequently, the extent to which the change in the parental role disrupts the life of the parent and requires adjustment can also influence his/her prosperity. The impact of the parental role change on his/her prosperity may be reinforced by other stressful events taking place around the same period of time. For example, retirement may coincide with the stage of empty nest; consequently, the required adjustment effort is intensified with an increased risk of exhaustion of homeostatic mechanisms.[9]

Empty nest during the early 70s affected mainly women and was a strong predictor of depression.[10] In contrast, other researchers found that the experience of empty nest had no effect on well-being. A study in the United States indicated that women empty-nesters showed greater life satisfaction and happier marital relations, in comparison with age-matched women who have a child at home.[11] Moreover, the departure of the youngest child, indeed, was generally anticipated with a sense of relief.[12]

The effect of empty nest on the relationship of the couple has long become the object of research. Deutscher[13] found an improvement in the couple's relationship following the departure of children from the parental home. In contrast, Glenn[11] found

no positive correlation with marital satisfaction of empty nest parents. The explanation given by the researcher was that the parental role is very stressful and most likely responsible for reduced marital satisfaction.

The finding that the experience of the empty nest is not the same for all parents, given that for some it proved to be a highly stressful situation while for others it was anticipated with pleasure, was constituted the thread guide of research in the 80s and 90s. Research interest was focused on establishing the parameters which rendered the experience of the empty nest as a stressful event. Women have spent more time raising the children and as a result they have a stronger bond with them. Because of the salience of the mother role, women experience more stress in their parental role compared to men,[14] who tend to show competitiveness and more tension with sons rather than daughters, while stepchildren may cause greater family pressure compared to biological children.[15] This competitiveness is important because triggers more conflict in the family making the transition to empty nest more difficult. There is a lack of evidence between the relationship with stepchildren and empty nest because of the complexity of the subject. Stepchildren are most likely to leave from their home maybe because they have the option to live with an alternative parent.

Research in the new millennium dealt with the experience of the empty nest in older adults who live alone and had infrequent contact with their children. Older adults who are experiencing the situation of the empty nest suffer from loneliness, physical and mental decline, and less life satisfaction compared to those who have regular contact with their children.[16] Low social support, low socio-economic status, divorce and widowhood were found to be predictors of loneliness and decreased life satisfaction.[17,18] Depressive symptoms were associated with education level/employment status, negative coping style, low support utilization, and economic status.[19,20]

Thus, it can be concluded that the main difficulty in clearly defining the effect of empty nest syndrome is that there is no specific pattern that can adequately describe this experience. It may depend on factors that cannot be easily investigated, such as the personality of the individual, psychosocial development, interactions of the family system and perception of the parental role.[14,15,21]

The impact of gender on stress of the empty-nest syndrome

Social approaches agree that gender does not refer to the biological and physiological characteristics that define man and woman, but to their socially constructed roles that have been judged as "appropriate". It is more "natural" and suitable for women as mothers to be more clinging to their child than men as fathers. Men and women have a different experience of the transitional stage of the nest because of their different roles and priorities, as well as ways of coping.

The risk of depression increases when the loss of the parental role coexists with the lack of other roles.[22,23] Adlemann[24] concluded that work acts as a protective factor against changes in the maternal role. However, the researchers showed that while work per se has a significant impact on well-being, the state of the empty nest has no major effect on the well-being of women.[25,26]

Given that the majority of evidence focuses on women, few studies support that men experience greater difficulty than women in the transitional period of empty nest. The most affected fathers were those with fewer children, higher self-nurturance scores, older in years, and in marriages which evidenced lower quality.[27] In traditional families, men relate the departure of children to the loss of their protective paternal role, while women report improvement in well-being and reduction in daily hassles.[4] Reduced parental role stress following college entrance was significantly related to the quality of parent-adolescent communication and the degree of emotional connectedness (for fathers) present in the family prior to the transition.[28] Fathers, as opposed to mothers, considered the children's departure as a step toward encouraging child maturity.[29] Fathers' satisfaction at having raised successful children was negatively related to both spouses' levels of perceived stress.[30]

Few studies have associated psychological symptoms with the physical changes of middle-aged empty nest women, particularly menopausal, even if the timing of the transition of the nest varies widely

in relation to the life of each woman as a mother. The physical symptoms are related to hormonal changes including hot flushes, night sweats, vaginal dryness, and breast tenderness. Dennerstein[5] found that return of children to home during the menopausal transition was associated with decline of positive mood and decline in the frequency of sexual activity for women. A very recent research showed that empty-nest-related psychological distress is associated with white brain matter lesions and loss of memory in the elderly.[31,32]

The impact of ethnic and cultural differences in the empty-nest syndrome

Various cultural groups adopt different norms, values, roles, and expectations regarding family types, relationships and ways of coping.[33–37] Indo-Eastern origin parents have strict principles regarding the appropriate withdrawal time (i.e. for studies, or marriage) and some families maintain the tradition of older male descendants remaining with their wives within the family in order to care for elderly parents.[36] In Africa, India, Middle East, and East Asia, older parents are held in very high esteem and it is virtually considered a child's duty to care for and respect them.[38] When these principles are not respected, it causes stress, sadness, or shame to the parents. In British families, the departure of children from the family is an indicator of parental success in raising children equipped face the challenges of autonomous adult life.[39] Conversely, in south-European families in Italy and Spain, the patriarchal model considers the empty nest as a loss of family heritage.[39] Italian mothers react negatively to the empty nest and feel a loss of wellness, while French mothers experience empty nest more positively retaining less traditional maternal roles and recognizing the potential return of children to the family home. There are no published data regarding Greek families and empty nest so far. Greek families have many common cultural characteristics with other southern European countries like Italy or Spain. Greek children for instance, delay their departure from home or parents experience more negative the empty nest syndrome. It is important to investigate more specific empty nest syndrome in Greek families, because even though they have many in common with southern European countries they also have Mediterranean cultural characteristics.

The return to the empty nest in the era of crisis

The current global economic crisis, which started unexpectedly in 2009, has radically changed the labor market. The crisis has dramatically reduced the personal income, forcing many into unemployment while the number of unstable and fleeting job opportunities has risen without providing, in many cases, any social health insurance. The unemployment rate in the USA reached 10% (October, 2009) while in Europe the situation was even more severe with Greece reaching 27.9%, Spain 26.3% and Italy 13% (Eurostat 2013). It is noteworthy that to date, after all these years of economic crisis, Greece is the only country among the southern European countries that after all these years of crisis continues to be in a precarious economic situation under memorandum obligations.[40]

The "Boomerang kids"

The term "boomerang kids" was first coined by Okimoto and Stegall[37] to describe young adults that return to the parental home following residential independence. It is not a rare phenomenon and almost 40% of young adults return to their parental home at least once after self-reliant living.[41] One of the most common reasons for returning home involves financial constraints due to unemployment or low income.[41,42] A partner break-up or a mental health ailment such as depression or drug/alcohol addiction can also lead to a young adult to return home and may well be the result of job loss in itself.[42]

We could divide the returners into two groups: young adults and those aged above 30 years. The unemployment rate of young adults, aged 15–24 years, is higher than the general population accounting for 47.4% in Greece and 44.5% in Spain.[43] In Australia, the United Kingdom, and the United States unemployment rates during the financial crisis for those aged 16 to 24 were notably higher than for the rest of the working population.[44] Although the financial crisis in Australia was relatively mild, well-being is significantly affected by economic shocks.[44] However, studies on empty-nesters during the financial crisis are lacking. Over the past decades, certain significant

structural and cultural changes have influenced the course of family life. For instance, the age at which couples choose to marry has risen, higher levels of education are sought and study years are longer and the unstable labor market is making it harder to gain financial independence.[45] Most young people find themselves in a semi-dependent situation, receiving financial assistance from parents and rendering the prolonged stay in the parental home or the return to home after college a predictable fact.[46] Despite the lack of specific data, the economic crisis is affiliated with a moral and value crisis, a rise in criminality, nationalism, individualism, exploitation and hostility, making it more unstable and stressful for young people to live on their own.

On the other hand, adults aged above 30 face a more complex situation. Unemployment, in this group tends to be viewed as a failure, thereby adding to the pressure to become earners and leading to feelings of anomie in terms of social roles and age-linked expectations, which are linked to cultural norms.[47] Adults aged 30–55 years may have children or their own business, a house mortgage or loans, all of which increase stress and anxiety levels. Albeit the return to the parental home has become relatively common nowadays, independence and self-accomplishment remain highly rated by a society that still supports social timetabling norms.[48] Economic stability and residential independence are crucial to the transition to adulthood. A return to the parental home may question their status as adults. It is noteworthy, that this age group may have had already "boomeranged" once before (e.g. after studies) and only to find themselves again in the same situation.[1]

Regardless of their age, the adults return is often accompanied by multiple losses: loss of work, self-esteem and independence leading to feelings of hopelessness, depression and anxiety. Joblessness affects psychological well-being, cognitive performance, motivation and perception of self-worth places a strain on personal relations.[46] In turn, this affects cohabitation on many levels, with both adults and parents having to adapt to changes and redefine their new role. The return to the nest, due to such a life changing factor as the current economic crisis, may even strengthen and encourage more quality relationships between family members.

The crowded nest

The transition from the empty to the "crowded" nest, as a result of current financial instabilities, is not an easy process. Returning home could compromise the relationship between child and parents and carry the risk of conflict, but at the same time, sharing time may also provide the opportunity for quality relations to develop.[48] One of the greatest challenges is the redefinition and negotiation of adult roles and identities, the individuation from parents. There are two psychological criteria that characterize the transition to adulthood: the equal relationship with parents, and independent decision making.[48]

Sassler[48] found that even though the returners strive to establish a relationship in such a way that they are considered as an equal adult and not as a dependent member, parents continue to perceive them as children. Furthermore, even though returners endeavor to make independent decisions, the parents tried to amerce their opinion over decisions about jobs, social life. It is as though the parents recreate childhood patterns to keep them in a dependent state, which inevitably provokes conflict.

Prominent changes, such as sudden unemployment and "boomeranging", question the adult's social and personal identity and idea of self, placing returners in a stigmatizing position. There is no specific data on how modern unemployed "boomerang kids" seek to re-establish their social status. According to social studies, potential coping strategies could include self-promotion (making other believe that they are capable), blarney (persuading others that they are likeable), intimidation, exemplary (showing that they are respectable/responsible) and pleading (to be shown pity as they are helpless).[49]

The return into the parental home may also affect the satisfaction with the living arrangement[48] as well as midlife parental marital satisfaction,[1] poor quality of life and well-being.[46] Parents risk lack of privacy and autonomy with the children's return.[45] Furthermore, the return may originate feelings of disappointment and self-blaming end even question their status as adequate and successful parents. Parents feel that it is their obligation to financially support their boomeranged child.[45]

Although research often considers that "crowded nest" adults cause major problems, such as marital friction, disputes and financial defalcation.[50] Other findings suggest low levels of conflict between parents and returning young adults.[45] Only 18% reported having had three or more disagreements.[15] These studies refer to recent decades, but current reality is different. It is not only boomeranged kids that face financial difficulties but also their parents, who may be unemployed or have a reduced pension and no social insurance. Families are hence called upon to overcome vital issues, which leads to greater and deeper conflicts.

Transactional model of stress and coping

According to the Transactional Model of Stress and Coping, introduced by Lazarus and Folkman,[51] stress coping can be achieved either by focusing on the problem (control and solve the problem by defying it, seeking a solution, reconsidering) or by focusing on the emotion (avoidance, quitting, acceptance, alcohol/ drug abuse). Which strategy is used will depend on the conditions and individual personality. They can be used separately or combined.

Unemployed "boomerang kids" can relieve stress either by perceiving the problem and trying to acquire new skills that will lead them to employment and independence, e.g. (free online educational seminars, learning a new language etc.) or by accepting the situation, maintaining sangfroid, recognizing the opportunity of renaissance and trying to establish harmonic relationships with the relatives. Accordingly, their families could either assign the house chores (to help children assume responsibility) or either accept the fact that unemployment is not their fault.

Family resilience framework model and recommendations

Family resilience is a term to describe how a family system can rise up, cope with stress and promote mental health. The interactions between the family members can be very dynamic when it is associated with how the members deal with the problems in their lives.[52] The people change when they successfully cope with life changing events.

Walsh[53] developed the family resilience framework model for stress relief, to overcome family crisis and promote growth and functional family unit. It is organized into three determiners: belief system, organizational patterns and communication/problem solving. According to Walsh this framework works as "conceptual map" that helps families to recover from challenging situations, overcome stress and be empowered.

Based on this model, unemployed boomerang kids and their parents need to find the meaning of their crisis and view it as a shared challenge. Keeping a positive view of the facts, will not perhaps, dissipate unemployment, but it can lead to more positive relationships – develop a new social network – and more constructive alternative ideas. Adaptability (flexibility and stability) and connectedness are essential for family resilience. Modern boomerang families need to find a new way of fitting with the current global reality. They have to abandon the age-old standards that are associated with employment, marital age, and starting a family. Stability, which can be established by developing an everyday routine, will balance friction of young adults returning, and create a "safety" net on which individuals can rely.[52] Open conversations and expression of emotions will enable better communication and help each other's differences within the family to be respected. The family has to support each other, by trying to find alternatives (e.g. change working field, continue education, increase job opportunities by relocating to another city), all of which can promote innovative business or career ideas, and the setting of goals.

Self-efficacy model

The self-efficacy model[54] is about one's belief in his ability to achieve anything. This belief affects the way people, think, feel and behave. According to Bandura "the higher the level of self-efficacy, the higher the performance accomplishments and the lower the emotional arousal". Self-efficacy model operates as a cognitive mechanism and helps individuals in stress coping and in life changing events.

Families with both parents and boomerang kids unemployed with low expectations regarding their abilities to act effectively in life, will experience frustration and act weakly and passively. On the other

hand, the higher the expectations, the more likely they are to achieve their goals and overcome failure. Unemployed boomeranged kids, can achieve higher self-efficacy by learning from their experiences, observing role models, acquiring verbal skills and developing a more positive somatic-emotional state.

Conclusions and recommendations for future research

The economic crisis has not only deepened global poverty but also the crisis regarding values reflected in a dynamic model of a family. Family resilience is not an easy process in the current changing context of life. The government should pay more attention to community social support-health promotion programs (broad coverage of health services, sense of coherence, maintaining healthy lifestyles and extensive social communication).[55–62] Only when these social policies are based on family functions and demands can they provide effective help to members of society, particularly regarding the family's responsibilities in raising children and supporting the elderly.[62] Modern family acts like the Greek god Proteus: change the status to cope with the crisis and the straits by creating psychosocial ways of adaption. Stress management aims at strengthening and encouraging the growth of new skills in order that people are better equipped to face these stressful life challenges and to acquire self-reliance and self-efficacy in recommendations that rely on their health and environment. Some practical transactional, family resilience framework and self-efficacy models include: (a) recognition that unemployment is not their fault and that they must have self-worth, (b) open conversations and expressing the emotions which will bring about better communication, (c) maintaining a positive attitude by finding motivation throughout education, online courses, art, hobbies, volunteering and physical exercise, (d) remembering that no one is alone and that they can always ask for help via counseling and psychotherapy. The empty nest can be transformed to a safe nest where family members develop themselves, support each other, and keep strong bonds in every aspect of life. Future enrichment programs should be designed to strengthen family resources and improve their life-long well-being and quality of life.

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Το ψυχοκοινωνικό στρες της άδειας φωλιάς: Εννοιολογικά ζητήματα, μελλοντικές κατευθύνσεις κατά την οικονομική κρίση

Α. Μπουγέα,[1,2] Α. Δεσπότη,[1] Ευ. Βασιλόπουλος[3]

[1]Α' Νευρολογική Κλινική, Ιατρική Σχολή Πανεπιστημίου Αθηνών, Αιγινήτειο Νοσοκομείο, Αθήνα,
[2]Μεταπτυχιακό Πρόγραμμα Επιστήμης του Στρες και Προαγωγής της Υγείας, Ιατρική Σχολή Πανεπιστημίου Αθηνών, Αθήνα,
[3]Α΄ Ψυχιατρική Κλινική, Πανεπιστήμιο Αθηνών, Αιγινήτειο Νοσοκομείο, Αθήνα

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Το σύνδρομο της άδειας φωλιάς αποτελεί ένα μεταβατικό στάδιο, κατά το οποίο γονείς της μέσης ηλικίας βρίσκονται στη διαδικασία της προώθησης των παιδιών τους στην ανάληψη των υπόχρεωσεών τους ως ενηλίκων. Το σύνδρομο της άδειας φωλιάς είναι μια ψυχολογική κατάσταση, η οποία επηρεάζει και τους δύο γονείς που ενδέχεται να βιώσουν συναισθήματα λύπης, απώλειας, φόβου,

αβεβαιότητας, δυσκολία στην αναπροσαρμογή των ρόλων τους και τη διαφοροποίηση των σχέσεών τους, όταν τα παιδιά αποχωρούν από την πατρική εστία. Αποκτά ιδιαίτερη σημασία σε έναν κόσμο όπου η τρέχουσα οικονομική κρίση έχει οξύνει την παγκόσμια φτώχεια και έχει οδηγήσει σε κρίση των αξιών, όπως αυτή αντανακλάται στο δυναμικό μοντέλο της οικογένειας. Σκοπός της παρούσας ανασκόπησης είναι να εξετάσουμε τις επιπτώσεις του ψυχολογικού στρες του συνδρόμου στη συναισθηματική υγεία και ευημερία των γονέων, λαμβάνοντας υπόψη το φύλο, το εθνικό και το πολιτιστικό τους υπόβαθρο, κοινωνικο-δημογραφικούς και άλλους παράγοντες πλαισίου μέχρι τη σύγχρονη οικονομική κρίση. Εξετάσαμε τις ψυχοκοινωνικές συνέπειες της επιστροφής στην κενή φωλιά των παιδιών "Boomerang", ως αποτέλεσμα των τρεχουσών οικονομικών αστοθειών. Τέλος, εστιάσαμε στις στρατηγικές με τις οποίες η οικογένεια μπορεί να διατηρήσει την ανθεκτικότητά της, σύμφωνα με το μοντέλο της ανθεκτικότητας και τα μοντέλα αυτο-αποτελεσματικότητας. Διεξήχθη ηλεκτρονική αναζήτηση στο Medline, Scopus, Embase, Cochrane and PsychINFO. Ο όρος empty-nest syndrome συνδυάστηκε με τις λέξεις: women, men, economic crisis, parenthood, stress, menopause, midlife crisis, Boomerang kids, crowded nest, resilience, self-efficacy, well-being, cultural differences. Γυναίκες και άνδρες από διάφορες κοινωνικές και πολιτιστικές ομάδες, έχουν μια διαφορετική εμπειρία της κενής φωλιάς, καθώς και των τρόπων αντιμετώπισής της. Το στρες της άδειας φωλιάς έχει ως συνέπεια την εκδήλωση καταθλιπτικών και συμπεριφορικών συμπτωμάτων και νοητικής εξασθένησης. Σύμφωνα με τις περισσότερες μελέτες, οι διαταραγμένες οικογενειακές σχέσεις –συγκρούσεις, συναισθηματική απόσταση, εχθρότητα– και η ελλιπής κοινωνική υποστήριξη επηρεάζουν αρνητικά την ευημερία των γονέων. Η χρηματοπιστωτική κρίση δύναται να μετατρέψει την άδεια φωλιά σε «δυναμική φωλιά» μέσω της ενδυνάμωσης των υπηρεσιών της κοινότητας. Προγράμματα κοινωνικής υποστήριξης θα πρέπει να σχεδιαστούν για την ενίσχυση των οικογενειακών πόρων και τη βελτίωση της ποιότητας της οικογενειακής ζωής.

Λέξεις ευρετηρίου: Σύνδρομο άδειας φωλιάς, οικογένεια, οικονομική κρίση, ανθεκτικότητα, ευημερία.

References

1. Mitchell BA, Gee EM. “Boomerang Kids” and Midlife Parental Marital Satisfaction. *Family Relations* 1996, 45: 442–448, doi: 10.2307/585174
2. Zhou Y, Zhou L, Fu C, Wang Y, Liu Q, Wu H et al. Socio--economic factors related with the subjective well-being of the rural elderly people living independently in China. *Int J Equity Health* 2015, 14:15, doi: 10.1186/s12939-015-0136-4
3. Gratton B, Gutmann MP. Emptying the nest: older men in the United States, 1880–2000. *Popul Dev Rev* 2010, 36:331–356, doi: 10.1111/j.1728-4457.2010.00332.x
4. Huerta R, Mena A, Malacara JM, de Leσn JD. Symptoms at perimenopausal period: its association with attitudes toward sexuality, life-style, family function, and FSH levels. *Psychoneuroendocrinology* 1995, 20:851–864, doi: 10.1016/0306-4530(94)00046-d
5. Dennerstein L, Dudley E, Guthrie J. Empty Nest or Revolving Door: A Prospective Study Of Women’s Quality of Life in Midlife During the Phase of Children Leaving and Re-Entering the Home. *Psychol Med* 2002, 32:545–550, doi: 10.1017/S0033291701004810
6. Eurostat. The Statistical Office of The European Union (Cited 31 December 2018) Available from http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/
7. Phillips BS. A Role Theory Approach to Adjustment in Old Age. *Am Sociol Rev* 1957, 22:212–217, doi: 10.2307/2088860
8. Thoits P. Multiple Identities and Psychological Well-Being: A Reformulation and Test of the Social Isolation Hypothesis. *Am Sociol Rev* 1983, 48:174–187, doi: 10.2307/2095103
9. Holmes JD, Rahe RH. The Social Readjustment Rating Scale. *J Psychosom Res* 1967, 11:213–218, doi: 10.1016/0022-3999(67)90010-4
10. Harkins, E. Effects of Empty Nest Transition on Self-Report of Psychological and Physical Well- Being. *J Marriage Fam* 1978, 40:549–556, doi: 10.2307/350935
11. Glenn NE. Psychological well-being in the post-parental stage: Some evidence from national surveys. *J Marriage Fam* 1975, 37:105–110, doi: 10.2307/351034
12. Lowenthal MF, Chiriboga D. Transition to the Empty Nest Crisis, Challenge, or Relief? *Arch Gen Psychiatry* 1970, 26:8–14, doi: 10.1001/archpsyc.1972.01750190010003
13. Deutscher I. From parental to post-parental life. *Sociol Symp* 1969, 3:47–60
14. McLanahan S, Adams J. Parent-hood and Psychological Well-Being. *Annu Rev Sociol* 1987, 13:237–257, doi: 10.1146/annurev.so.13.080187.001321

15. Suitor J, Pillemer K. Explaining Intergenerational Conflict when Adult Children and Elderly Parents Live together. *J Marriage Fam* 1988, 50:1037–1047
16. Wang G, Hu M, Xiao SY, Zhou L. Loneliness and depression among rural empty-nest elderly adults in Liuyang, China: a cross-sectional study. *BMJ Open* 2017, 7:e016091, doi: 10.1136/bmjopen-2017-016091
17. Liu LJ, Guo Q. Life satisfaction in a sample of empty-nest elderly: a survey in the rural area of a mountainous county in China. *Qual Life Res* 2008, 17:823–830, doi: 10.1007/s11136-008-9370-1
18. Wu ZQ, Sun L, Sun YH, Zhang XJ, Tao FB, Cui GH. Correlation between loneliness and social relationship among empty nest elderly in Anhui rural area, China. *Aging Ment Health* 2010, 14:108–112, doi: 10.1080/13607860903228796
19. Xie LQ, Zhang JP, Peng F, Jiao NN. Prevalence and related influencing factors of depressive symptoms for empty-nest elderly living in the rural area of Yong Zhou, China. *Arch Gerontol Geriatr* 2010, 50:24–29, doi: 10.1016/j.archger.2009.01.003
20. Zhai Y, Yi H, Shen W, Xiao Y, Fan H, He F et al. Association of empty nest with depressive symptom in a Chinese elderly population: A cross-sectional study. *J Affect Disord* 2015, 187: 218–223, doi: 10.1016/j.jad.2015.08.031
21. Dubey B, Jain K. Empty nest syndrome as a function of personality dimension and socio-economic status. *Int J Curr Res* 2018, 10:70384–70386, doi: 10.24941/ijcr.30993. 06.2018
22. Liang Y, Wu W. Exploratory analysis of health-related quality of life among the empty-nest elderly in rural China: An empirical study in three economically developed cities in eastern China. *Health Qual Life Outcomes* 2014, 12:59, doi: 10.1186/1477-7525-12-59
23. Cheng P, Jin Y, Sun H, Tang Z, Zhang C, Chen Y et al. Disparities in prevalence and risk indicators of loneliness between rural empty nest and non-empty nest older adults in Chizhou, China. *Geriatr Gerontol Int* 2015, 15:356–64, doi: 10.1111/ggi.12277
24. Adelmann PK, Antonucci TC, Crohan SE, Coleman LM. Empty Nest, Cohort, and Employment in the Well-Being of Midlife Women. *Sex Roles* 1989, 20: 173–189, doi: 10.1007/bf0028799
25. Radloff LS. Depression and the Empty Nest. *Sex Roles* 1980, 6:775–781, doi: https://doi.org/10.1007/bf00287233
26. Coleman LM, Antonucci TC. Impact of work on women at midlife. *Dev Psychol* 1983, 19:290–294, doi:10.1037/0012-1649.19.2.290
27. Lewis RA, Freneau PJ, Roberts CL. Fathers and The Postparental Transition. *Fam Coord* 1979, 28:514–520, doi: 10.2307/583513
28. Anderson SA. Parental Stress and Coping During The Leaving Home Transition. *Fam Relat* 1988, 37:160–165, doi: 10.2307/584314
29. Lomranz J, Shmotkin D, Eyal N, Zohar Y. Launching themes in Israeli fathers and mothers. *J Adult Dev* 1996, 3:159–170, doi: 10.1007/BF02285776
30. Bouchard G. A Dyadic Examination of Marital Quality at the Empty-Nest Phase. *Int J Aging Hum Dev* 2018, 86:34–50, doi: 10.1177/0091415017691285
31. Duan D, Dong Y, Zhang H, Zhao Y, Diao Y, Cui Y et al. Empty-nest-related psychological distress is associated with progression of brain white matter lesions and cognitive impairment in the elderly. *Sci Rep* 2017, 7:43816, doi: 10.1038/srep43816
32. Wang Z, Shu D, Dong B, Luo L, Hao Q. Anxiety disorders and its risk factors among the Sichuan empty-nest older adults: a cross-sectional study. *Arch Gerontol Geriatr* 2013, 56:298–302, doi: 10.1016/j.archger.2012.08.016
33. Borland D. A Cohort Analysis Approach to the Empty-nest Syndrome Among Three Ethnic Groups of Women: A Theoretical Position. *J Marriage Fam* 1982, 44:117–129, doi: 10.2307/351267
34. Mitchell BA, Wister AV. Midlife Challenge or Welcome Departure? Cultural and Family-Related Expectations of Empty Nest Transitions. *Int J Aging Hum Dev* 2015, 81:260–80, doi: 10.1177/0091415015622790
35. Pillay AL. Midlife depression and the "empty nest" syndrome in Indian women. *Psychol Rep* 1988, 63:591–4, doi: 10.2466/pr0.1988.63.2.591
36. Putney NM, Bengtson VL. Family relation in changing times: A Longitudinal Study of Five Cohorts of Women. *Int J Sociol Soc* Policy 2005, 25:92–119, doi: 10.1108/01443330510791144
37. Okimoto JD, Stegall PJ. *Boomerang kids: how to live with adult children who return home*. Pocket Books, New York, 1989
38. Dixon SV, Graber JA, Brooks-Gunn J. The roles of respect for parental authority and parenting practices in parent-child conflict among African American, Latino, and European American families. *J Fam Psychol* 2008, 22:1–10, doi: 10.1037/0893-3200. 22.1.1
39. Sven Reher D. Family Ties in Western Europe: Persistent Contrasts. *Popul Dev Rev* 1998, 24:203–234, doi: 10.2307/2807972
40. OECD. *OECD Economic Surveys: Greece*. OECD Publishing, Paris, 2016
41. Sironi M. Economic Conditions of Young Adults Before and After the Great Recession. *J Fam Econ Issues* 2018, 39:103–116, doi: 10.1007/s10834-017-9554-3
42. Sandberg-Thoma SE, Snyder AR, Jang BJ. Exiting and Returning to the Parental Home for Boomerang Kids. *J Marriage Fam* 2015, 77:806–818, doi: 10.1111/jomf.12183
43. OECD. Youth unemployment rate.(Cited 31 December 2015) Available from https://data.oecd.org/unemp/youth-unemployment-rate.htm
44. Parker PD, Jerrim J, Anders J. What Effect Did the Global Financial Crisis Have Upon Youth Wellbeing? Evidence From Four Australian Cohorts. *Dev Psychol* 2016, 52:640–651, doi: 10.1037/dev0000092
45. West AJ, Roberts J, Noden P. Young Adult Graduates Living in the Parental Home: Expectations, Negotiations, and Parental Financial Support. *J Fam Issues* 2016, 34:975–1007, doi: 10.1177/0192513X16643745
46. Córdoba-Doρa J, Sebastiαn MS, Escolar-Pujolar A, Martvnez-Faure J, Gustafsson PE. Economic crisis and suicidal behavior: the role of unemployment, sex and age in Andalusia, Southern Spain. *Int J Equity Health* 2014, 13:55, doi: 10.1186/1475-9276-13–55
47. Beck U, Beck-Gernsheim E. *Individualisation: Institutionalised Individualism and Its Social and Political Consequences*. Sage, London, 2002
48. Sassler S, Ciambrone D, Benway G. Are they really mama's boys/daddy's girls? The negotiation of adulthood upon return-

ing to the parental home. *Sociol Forum* 2008, 23:670–698, doi: 10.1111/j.1573-7861.2008.00090.x

49. Jones EE, Pittman TS. Toward a general theory of strategic self presentation. In: Suls J (ed) *Psychological perspectives on the self*. Lawrence Erlbaum, Hillsdale, NJ, 1982:231–262
50. Tosi M, Grundy E. Returns home by children and changes in parents' well-being in Europe. *Soc Sci Med* 2018, 200:99–106, doi: 10.1016/j.socscimed.2018.01.016
51. Lazarus RS, Folkman S. *Stress, appraisal, and coping*. Springer, New York, 1984
52. Herdiana I, Suryanto D, Handoyo S. *Family Resilience: A Conceptual Review*. Proceedings of the 3rd ASEAN Conference on Psychology, Counselling, and Humanities (ACPCH 2017), Series: Advances in Social Science, Education and Humanities Research 2018, doi: 10.2991/acpch-17.2018.9
53. Walsh F. Applying a Family Resilience Framework in Training, Practice, and Research: Mastering the Art of the Possible. *Fam Process* 2016, 55:616–632, doi: 10.1111/famp.12260
54. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev* 1977, 84:191–215, doi: 10.1037/0033-295X.84.2.191
55. Gong F, Zhao D, Zhao Y, Lu S, Qian Z, Sun Y. The factors associated with geriatric depression in rural China: stratified by household structure. *Psychol Health Med* 2018, 23:593–603, doi: 10.1080/13548506.2017.1400671
56. Huang Lj Mm, Du WT, Liu YC, Guo LN, Zhang JJ BS, Qin MMBS et al. Loneliness, Stress, and Depressive Symptoms Among the Chinese Rural Empty Nest Elderly: A Moderated Mediation Analysis. *Issues Ment Health Nurs* 2019, 40:73–78, doi: 10.1080/01612840.2018.1437856
57. Murphy DA, Roberts KJ, Herbeck DM. HIV-positive mothers with late adolescent/early adult children: "empty nest" concerns. *Health Care Women Int* 2012, 33:387–402, doi: 10.1080/07399332.2012.655395
58. Zhang C, Zhao H, Zhu R, Lu J, Hou L, Yang XY et al. Improvement of social support in empty-nest elderly: results from an intervention study based on the Self-Mutual-Group model. *J Public Health* (Oxf) 2018, doi: 10.1093/pubmed/fdy185
59. Zhang C, Xue Y, Zhao H, Zheng X, Zhu R, Du Y et al. Prevalence and related influencing factors of depressive symptoms among empty-nest elderly in Shanxi, China. *J Affect Disord* 2019, 245:750–756, doi: 10.1016/j.jad.2018.11.045
60. Yang T, Chu J, Zhou C, Medina A, Li C, Jiang S et al. Catastrophic health expenditure: a comparative analysis of empty-nest and non-empty-nest households with seniors in Shandong, China. *BMJ Open* 2016, 6:e010992, doi: 10.1136/bmjopen-2015-010992
61. Xu J, Sun Y, Wang Z. Prevalence and risk factors of depression in the empty nest elderly from the Sichuan Longmenshan fault earthquake. *Geriatr Gerontol Int* 2017, 17: 2143–2149, doi: 10.1111/ggi.13050
62. Su Z, Hu Z, Peng X. The impact of changes in China's family patterns on family pension functions. *Int J Health Planning Manage* 2017, 32:351–362, doi: 10.1002/hpm.2436

Corresponding author: A. Bougea, Neurologic Clinic of Eginition Hospital, 72–74 Vasilissis Sofias Ave, GR-115 28 Athens, Greece, Tel: (+30) 210-72 89 286, e-mail: abougea@med.uoa.gr

Case report
Ενδιαφέρουσα περίπτωση

Zolpidem related persistent genital arousal disorder: An interesting case

F. Ferenidou, I. Mourikis, P. Sotiropoulou, N. Vaidakis

Outpatient Clinic for Psychosexual Disorders, 1st Department of Psychiatry, University of Athens Medical School, Eginition Hospital, Greece

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The present paper is describing a case of persistent genital arousal disorder that developed to a 55-year-old woman, shortly after the initiation of zolpidem. Persistent genital arousal disorder (PGAD) is a clinical entity that appears with a relatively low frequency in women, and is characterized by persistent or recurrent, unwanted and bothersome feelings of genital arousal, which often do not resolve with orgasm and are not associated with sexual desire (sexual interest, thoughts or fantasies). Women who experience PGAD often have feelings of shame, guilt and distress. Although its exact etiology remains unclear, various etiological factors have been proposed, central or peripheral, which may be psychological, vascular, dietary, pharmacological or neurological. Additionally, its presence has been associated to restless legs syndrome and overactive bladder syndrome. Likewise, multiple therapeutic interventions have been proposed and tried in patients with PGAD, either pharmacological (SSRIs, SNRIs, antiandrogens, benzodiazepines, antipsychotics, anticonvulsive agents) or other (ECT, physiotherapy, psychotherapy, nerve stimulation). Zolpidem is a non-benzodiazepine indirect GABA A receptor agonist, which has lately been used as a therapeutic agent for PGAD in some cases. Nevertheless, in our patient, receiving zolpidem for insomnia seemed to be timely connected to the onset of PGAD symptomatology. The aim of the present paper is to highlight the need for more research into the possible factors that may contribute to PGAD.

Key words: Persistent genital arousal disorder, persistent sexual arousal syndrome, sexual side-effects, drug side-effects related to sexual function, zolpidem.

Introduction

Persistent genital arousal disorder (PGAD), also known as persistent sexual arousal syndrome (PSAS), is a relatively rare condition that affects women and is characterized by unremitting genital arousal in the absence of conscious feelings of sexual desire.[1,2] More specifically, PGAD may include all or some of the following symptoms: spontaneous, intrusive, and unwanted signs of

physiologic sexual arousal (e.g. genital fullness and sensitivity, tingling, throbbing, pulsating), which do not resolve on their own or even after orgasmic experience and may persist for hours or days, in the absence of sexual interest and desire and unrelated to subjective feelings of sexual arousal (the awareness of subjective arousal is typically, but not invariably, unpleasant), triggered by sexual or non-sexual stimuli, while causing at least moderate distress since they are considered unwanted and intrusive.[3,4]

It is still unclear whether its etiology is central or peripheral, since due to its low frequency most of the literature on the topic is based on case reports, suggesting multiple etiologies as well as therapeutic interventions.[5–9] More specifically, regarding possible etiologies, psychological entities (e.g. history of sexual abuse, comorbidity with depression or anxiety), vascular changes (e.g. pelvic congestion syndrome), dietary explanations (such as high intake of soy products), meningeal cysts (e.g. Tarlov cysts), central (e.g. epilepsy) or peripheral neurologic causes (e.g. small-fiber neuropathy theory), relationship with restless legs syndrome, as well as several pharmacologic agents (their initiation as well as their cessation), have been discussed by several authors in the literature.[5,6,10,11] In any case, most commonly, PGAD is a distressing condition, which may even lead to social isolation or suicidal ideation.[8]

Multiple therapeutic interventions have been proposed, but since no specific cause identification exists, similarly no therapeutic algorithm exists. Nevertheless, multiple treatments have been reported in the literature, such as electroconvulsive therapy, pelvic floor physiotherapy, nerve stimulation, psychotherapeutic interventions, as well as various oral medications such as SSRIs or SNRIs, antiandrogens (e.g. leuprolide), anticonvulsive agents (e.g. pregabalin), benzodiazepines (e.g. clonazepam) and antipsychotics (e.g. risperidone, quetiapine).[5–8,12]

Zolpidem is a non-benzodiazepine indirect GABA A receptor agonist. Its sedative-hypnotic and anticonvulsive activities seem to be due to its action on a1-GABA A receptors and not on the rest of GABA A receptors (a2 or a3).[13] There is no reported connection so far between zolpidem and PGAD, except for the fact that it has recently been used in low doses (<2.5 mg) as a therapeutic agent,[14–17] perhaps by blocking dopamine transmission (dopamine neurons are inhibited by GABA neurons) and thus the inhibition of serotonin release, allowing serotonin to increase and reducing PGAD symptoms.[15–17]

Here we discuss a case of a woman presenting with symptoms of persistent genital arousal disorder, after the initiation of zolpidem, which was prescribed for the treatment of insomnia.

Case history (table 1)

The patient is a 55-year-old Caucasian female, mother of two children (31-year-old male and 29-year-old female, both born by natural labors) and married for 32 years, while she is working as a cleaning lady for the last 27 years for a private cleaning company. Regarding her medical history, she has never had any major operation, or had taken any medication for a long period of time –neither in the past nor during the period of her assessment– for any organic or psychiatric cause.

Three months before presenting to Eginition hospital, she reported visiting her internist, because she was experiencing gradual worsening of her sleeping habits (less sleeping hours, followed by fatigue during the daytime). This condition kept getting worse, until 15 days before her visit to Eginition hospital when she felt that she could hardly sleep for more than 3 or 4 hours in the night, sometimes intermittent sleep, while some of the nights she felt like she had hardly slept at all. Additionally, she recalls poor quality and amount of sleep, and fatigue. She does not recall any stressful event or condition preceding this period. Then she began receiving valerian for 15 days with poor response and –following her internist's advice– she also began receiving zolpidem 10 mg before bedtime. Poor response is reported during the first two nights and only during the third night did she manage to sleep for some hours. At the same time, at the third day of zolpidem intake, she reports feelings of tension and mild anxiety,

Table 1. The course of symptoms of PGAD and the applied treatments, before and after the visit in the Sexual Disorders Treatment Unit of Eginition Hospital.

3 months before	**15 days before**	**7 days before**	**1st visit** *(Eginition hospital)*	**1 week after** *(2nd visit, private practice psychiatrist)*	**3 weeks after**	**4 weeks after**	**2 months after**
Insomnia, fatigue	Worsening of insomnia *Valerian initiation but no sleep improvement*	Zolpidem initiation *PGAD after the 3rd day, zolpidem cessation but PGAD remains*	Quetiapine initiation (50 mg, twice daily) *PGAD stops* *No PGAD*	Quetiapine cessation due to side effects and olanzapine initiation, 5 mg before bedtime	No changes *No PGAD*	↓Olanzapine (2.5 mg before bedtime) *No PGAD*	No changes *No PGAD*

along with symptoms of persistent genital arousal disorder. More specifically, she describes genital swelling, pulsating, tingling and sensitivity, without nipple fullness or swelling that did not subside on their own. Genital arousal did not resolve with orgasmic experience, was unrelated to external stimuli or subjective sense of arousal, was triggered by non-sexual stimuli and was described as unwanted and intrusive, causing important degree of distress.

PGAD symptomatology lasted for a week, even though zolpidem intake was ceased immediately. At the end of this week, she visited the emergency outpatient clinic of Eginition hospital and was directly referred to the special outpatient clinic of psychosexual disorders. Psychiatric evaluation included clinical assessment and administration of the Mini International Neuropsychiatric Interview.[18] She did not meet criteria for any psychiatric disorder, neither during the time of the evaluation, nor in the past and she did not reveal any sexual trauma. Her personality traits did not meet the criteria for any personality disorder. Regarding her sexual function during this period and in the past, it never seemed to be problematic or dysfunctional in any domain. At the same time, she underwent a gynecologic exam, along with a basic laboratory investigation, which did not reveal anything abnormal. After the clinical evaluation, it was explained to her that her symptoms could be attributed to an identified disorder named PGAD. Since atypical antipsychotics have been discussed in the literature and have been used as therapeutic agents for PGAD,[5,6] the patient was advised to start receiving quetiapine 25 mg twice a day and was advised to gradually increase the daily dose to 100 mg. Remission of the abovementioned symptoms took place when quetiapine was increased to 50 mg twice a day. After a week of the cessation of the symptoms, she visited a psychiatrist in private practice, who stopped quetiapine due to its sedative action during the day, which the patient could not tolerate. Alternatively, he advised her to receive olanzapine 5 mg daily, before bedtime. The symptoms of PGAD never appeared again, and the patient continuously re-

ceives olanzapine, now 2.5 mg before bedtime, reporting satisfying sleep duration and quality. Provided that she remains asymptomatic, olanzapine will eventually be withdrawn.

Discussion

The etiology of PGAD remains enigmatic. Nevertheless, as mentioned above, psychological, vascular, dietary, neurological, as well as pharmacological factors have been discussed by the literature as possible contributors to this disorder. Among other drugs, the use or withdrawal of antidepressants has been connected to the onset of persistent genital arousal symptomatology. Regarding PGAD induced after SSRI anti-depressant withdrawal, possible mechanisms are either local vulval vasodilation[19] or the return to baseline sexual desire and genital arousal, which were suppressed during SSRI medication.[20] On the other hand, antidepressant initiation and particularly nefazodone, citalopram, buproprion, paroxetine, venlafaxine, trazodone and fluoxetine have been reported to trigger PGAD symptomatology.[5,6,21–23] Proposed mechanisms include increased clitoral volume and vasoengorgement (especially with trazodone),[23] increased angiogenesis that follows antidepressant medication,[21] but still the exact mechanism that antidepressants may trigger PGAD remains unclear.

Could the initiation of zolpidem play a role in the PGAD onset in our patient, since there was a timely connection between initiation and PGAD onset? Recent case reports[14–17] have proposed zolpidem as a therapeutic agent for PGAD. In these cases, zolpidem was administered in low doses (0.5–2.5 mg, up to 4 times daily) either alone or along with other drugs (tramadol) and seemed to reduce PGAD symptomatology. The proposed mechanism was decreasing the inhibition of serotonin release by blocking dopamine transmission.[15–17] On the other hand, as noted above, the increase of serotonin has been associated with the trigger of PGAD symptomatology, probably due to vasoengorgement or angiogenesis, induced by antidepressants.[5,6,21,23] It is important to note that the patient has also received valerian for 15 days, at the same time that she initiated zolpidem. Valerian has a mechanism of action similar to that of benzodiazepines, since it has an affinity for GABA A receptors, with a high amount of GABA present in the valerian extract itself.[24] Therefore, the dose of GABA A receptor agonist that our patient received, might exceed 10 mg per day that she initially received through zolpidem.

Regarding pharmacokinetics, the drug-metabolizing enzymes cytochrome P450 3A4(CYP3A4), 2D6 (CYP2D6) and 1A2(CYP1A2) seem to be mainly involved in the metabolism of zolpidem.[25] *In vitro* studies assessing valerenic acid have not revealed significant effects upon CYP3A4 or other P450 isoforms.[26] However, valerian *in vivo* may moderately increase drug Cmax (of the drug which is metabolized using the CYP3A4 isoform), when typical doses are used, although this increase is considered clinically insignificant.[27] Interestingly enough, endocrine factors seem to also be associated with CYP3A4 metabolism, since low plasma concentrations of free testosterone may contribute to lower CYP3A4 activity, and therefore explain up to 50% higher zolpidem plasma levels in women.[28] Therefore, in the present case, although of small relevance, the gender, as well as pharmacokinetics of zolpidem and valerian may have also been slightly involved in PGAD symptomatology.

The present paper discusses the observations of a single case only and obviously the results cannot be generalized. Additionally, we must point out the following limitations: neither a baseline hormone profile nor an imaging examination took place when the patient first presented with PGAD symptoms, which are proposed by the literature to be included in the baseline assessment.[5,6] Therefore, our observations should be interpreted with caution. This is the first case to imply that there could be a connection between high doses of zolpidem or when zolpidem is combined with another GABA A receptor agonist and PGAD symptom onset. More research is needed to verify if there is such an action and identify the probable underlying mechanism. This could lead to a better insight into possible factors that are associated with the trigger of this interesting disorder.

Σχετιζόμενη με τη ζολπιδέμη διαταραχή επίμονης σεξουαλικής διέγερσης: Μια ενδιαφέρουσα περίπτωση

Φ. Φερενίδου, Η. Μουρίκης, Π. Σωτηροπούλου, Ν. Βαϊδάκης

Ειδικό Ιατρείο Ψυχοσεξουαλικών Διαταραχών, Α΄ Ψυχιατρική Κλινική, Ιατρική Σχολή Πανεπιστημίου Αθηνών, Αιγινήτειο Νοσοκομείο, Αθήνα

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Σκοπός της παρούσας εργασίας είναι η περιγραφή μιας περίπτωσης επίμονης γεννητικής σεξουαλικής διέγερσης που παρουσιάστηκε σε μία γυναίκα 55 ετών, ύστερα από την έναρξη λήψης ζολπιδέμης. Η διαταραχή επίμονης σεξουαλικής διέγερσης (ΔΕΣΔ) είναι μια κλινική οντότητα που εμφανίζεται με χαμηλή συχνότητα στις γυναίκες, και χαρακτηρίζεται από επίμονα ή επαναλαμβανόμενα, ανεπιθύμητα και ενοχλητικά ερεθίσματα γεννητικής διέγερσης, τα οποία συνήθως δεν υποχωρούν με τον οργασμό και δεν σχετίζονται με σεξουαλική επιθυμία (σεξουαλικό ενδιαφέρον, σκέψεις ή φαντασιώσεις). Οι γυναίκες που παρουσιάζουν ΔΕΣΔ μπορεί να έχουν αισθήματα ντροπής, ενοχής ή δυσφορίας. Παρά το γεγονός ότι η ακριβής αιτιολογία δεν είναι ξεκάθαρη, πολλοί αιτιολογικοί παράγοντες έχουν προταθεί, κεντρικοί ή περιφερικοί, και μπορεί να είναι ψυχολογικοί, αγγειακοί, διατροφικοί, φαρμακολογικοί ή νευρολογικοί. Επιπρόσθετα, η παρουσία του έχει συσχετισθεί με το σύνδρομο ανήσυχων ποδιών και το σύνδρομο υπερδραστήριας κύστης. Αντίστοιχα, έχουν προταθεί και δοκιμαστεί πολλές θεραπευτικές παρεμβάσεις, είτε φαρμακευτικές (SSRIs, SNRIs, αντιανδρογόνα, βενζοδιαζεπίνες, αντιψυχωσικά, σπασμολυτικοί παράγοντες) είτε άλλες (ECT, φυσικοθεραπεία, ψυχοθεραπεία, νευροδιέγερση). Η ζολπιδέμη είναι ένας έμμεσος μη-βενζοδιαζεπινικός GABA A αγωνιστής, ο οποίος έχει πρόσφατα χρησιμοποιηθεί και για τη θεραπεία της ΔΕΣΔ. Παρόλ' αυτά, η λήψη ζολπιδέμης από την ασθενή μας για την αντιμετώπιση αϋπνίας, φάνηκε να σχετίζεται χρονικά με την έναρξη συμπτωματολογίας ΔΕΣΔ. Σκοπός του παρόντος άρθρου είναι η ανάδειξη της ανάγκης διεξαγωγής περαιτέρω μελετών προκειμένου να αναδειχθούν οι παράγοντες που σχετίζονται με τη ΔΕΣΔ.

Λέξεις ευρετηρίου: Διαταραχή επίμονης σεξουαλικής διέγερσης, σύνδρομο επίμονης σεξουαλικής διέγερσης, σεξουαλικές παρενέργειες, παρενέργειες φαρμάκων σχετιζόμενες με τη σεξουαλική λειτουργία, ζολπιδέμη.

References

1. Kirana PS. Female Sexual Arousal Disorders. In: Kirana PS, Tripodi F, Reisman Y, Porst H (eds) *The EFS and ESSM Syllabus of Clinical Sexology*. Amsterdam, MEDIX, 2013
2. Leiblum S. Persistent Genital Arousal Disorder. In: Leiblum S (ed) *Principles and practice of sex therapy*. NY, The Guilford Press, 2007
3. Leiblum SR, Nathan SG. Persistent sexual arousal syndrome: a newly discovered pattern of female sexuality. *J Sex Marital Ther* 2001,27:365–380, doi: 10.1080/009262301317081115
4. McCabe M, Sharlip I, Atalla E, Balon R, Fisher A, Laumann E et al. Definitions of Sexual Dysfunctions in Women and Men: A Consensus Statement from the Fourth International Consultation on Sexual Medicine. *J Sex Med* 2016,13:135–143, doi: 10.1016/j.jsxm.2015.12.019
5. Facelle T, Sadeghi-Nejad H, Goldmeier D. Persistent genital arousal disorder: characterization, etiology, and management. *J Sex Med* 2013,10:439–450, doi: 10.1111/j.1743-6109.2012.02990.x
6. Jackowich R, Pink L, Adult NP, Gordon A, Pukall C. Persistent genital arousal disorder: A review of its conceptualizations, potential origins, impact, and treatment. *Sex Med Rev* 2016, 4:329–342, doi: 10.1016/j.sxmr.2016.06.003
7. Rosenbaum TY. Physical therapy treatment of persistent genital arousal disorder during pregnancy: a case report. *J Sex Med* 2010, 7:1306–1310, doi: 10.1111/j.1743-6109.2009.01654.x

8. Philippson S, Kruger T. Persistent genital arousal disorder: successful treatment with duloxetine and pregabalin in two cases. *J Sex Med* 2012, 9:213–217, doi: 10.1111/j.1743-6109.2011.02518.x
9. Wylie K, Levin R, Hallam-Jones R, Goddard A. Sleep exacerbation of persistent sexual arousal syndrome in a postmenopausal woman. *J Sex Med* 2006, 3:296–302, doi: 10.1111/j.1743-6109.2005.00167.x
10. Amsterdam A, Abu-Rustum N, Carter J, Krychman M. Persistent sexual arousal syndrome associated with increased soy intake. *J Sex Med* 2005, 2:338–340, doi: 10.1111/j.1743-6109.2005.20358.x
11. Waldinger MD, Schweitzer DH. Persistent genital arousal disorder in 18 Dutch women: Part II. A syndrome clustered with restless legs and overactive bladder. *J Sex Med* 2009, 6:482–497, doi: 10.1111/j.1743-6109.2008.01114.x
12. Deka K, Dua N, Kakoty M, Ahmed R. Persistent genital arousal disorder: Successful treatment with leuprolide (antiandrogen). *Indian J Psychiatry* 2015, 57:326–328, doi: 10.4103/0019-5545.166633
13. Crestani F, Martin J, Moehler H, Rudolph U. Mechanism of action of the hypnotic zolpidem *in vivo*. *Br J Pharmacol* 2000, 131:1251–1254, doi: 10.1038/sj.bjp.0703717
14. King SA, Espenschied C, Gagnon C, Minton J, Goldstein I. Lifetime persistent genital arousal disorder: management of PGAD in an adolescent. *J Sex Med* 2016,13:S239–S262, doi: 10.1016/j.jsxm.2016.04.049
15. King SA, Goldstein I, Pfaus J. Mechanism of action and preliminary clinical experience with zolpidem, a non-benzodiazepine indirect GABA A receptor agonist, for symptomatic treatment of persistent genital arousal disorder (PGAD). *J Sex Med* 2016, 13:S239–S262, doi: 10.1016/j.jsxm.2016.04.020
16. Goldstein I, Cataldo L, Komisaruk BR, Pfaus J. Treatment of persistent genital arousal disorder (PGAD) with zolpidem, a non-benzodiazepine indirect GABA A receptor agonist: mechanism of action and preliminary clinical experience. *J Sex Med* 2017, 14:S1–S131, doi: 10.1016/j.jsxm.2016.11.288
17. Goldstein I, Cataldo L, Komisaruk BR, Winter AG, Rubin RS, Pfaus J. Use of zolpidem, a non-benzodiazepine indirect GABA a receptor agonist, for treatment of persistent genital arousal disorder (PGAD): mechanism of action and preliminary clinical experience. *J Sex Med* 2017, 14:e1–e104, doi: 10.1016/j.jsxm.2016.12.093
18. Papadimitriou G, Berati S, Matsoukas T, Soldatos KP. *Mini International Neuropsychiatric Interview*. Greek Version 5.0.0. 2005
19. Goldmeier D, Leiblum S. Persistent genital arousal disorder -A new syndrome entity. *Int J STD AIDS* 2006,17:215–216, doi: 10.1258/095646206776253480
20. Goldmeier D, Leiblum S. Interaction of organic and psychological factors in persistent genital arousal disorder in women: A report of six cases. *Int J STD AIDS* 2008,19:488–490, doi: 10.1258/ijsa.2007.007298
21. Leiblum S, Goldmeier D. Persistent genital arousal disorder in women: case reports of association with anti-depressant usage and withdrawal. *J Sex Marital Ther* 2008, 34:150–159, doi: 10.1080/00926230701636205
22. Mahoney S, Zarate C. Persistent sexual arousal syndrome: A case report and review of the literature. *J Sex Marital Ther* 2007, 71:65–71, doi: 10.1080/00926230600998532
23. Battaglia C, Venturoli S. Persistent genital arousal disorder and trazodone: Morphometric and vascular modifications of the clitoris. A case report. *J Sex Med* 2009, 6:2896–900, doi: 10.1111/j.1743-6109.2009.01418.x
24. Benke D, Barberis A, Kopp S, Altmann KH, Schubiger M, Vogt KE et al. GABA A receptors as *in vivo* substrate for the anxiolytic action of valerenic acid, a major constituent of valerian root exrtacts. *Neuropharm* 2009, 56:174–181, doi: 10.1016/j.neuropharm.2008.06.013
25. von Moltke LL, Greenblatt DJ, Granda BW, Duan SX, Grassi JM, Venkatakrishnan K et al. Zolpidem metabolism *in vitro*: responsible cytochromes, chemical inhibitors, and *in vivo* correlations. *Br J Clin Pharmacol* 1999, 48:89–97, doi: 10.1046/j.1365-2125.1999.00953.x
26. Zou L, Harkey MR, Henderson GL. Effects of herbal components on c-DNA-expressed cytochrome P450 enzyme catalytic activity. *Life Sci* 2002, 71:1579–1589, PMID: 12127912
27. Donovan JL, DeVane CL, Chavin KD, Wang J-S, Gibson BB, Gefroh HA et al. Multiple night-time doses of Valerian (Valeriana officinalis) had minimal effects on CYP3A4 activity and no effect on CYP2D6 activity in healthy volunteers. *Drug Metab Dispos* 2004, 32:1333–1336, doi: 10.1124/dmd.104.001164
28. Olubodun JO, Ochs HR, VON Moltke LL, Roubenoff R, Hesse LM, Harmatz JS et al. Pharmacokinetic properties of zolpidem in elderly and young adults: possible modulation by testosterone in men. *Br J Clin Pharmacol* 2003,56:297–304, PMID: 12919178

Corresponding author: F. Ferenidou, 16 G. Drosini street, GR-145 62 Kifisia, Attiki, Greece, Tel: (+30) 210-80 10 798, e-mail: fferenidou@yahoo.com

Letter to the Editor
Επιστολή προς τη Σύνταξη

What opportunities do European early career psychiatrists have?

G. Pagkalos,[1] J. Ismayilova,[2] O. Kilic,[3]
T.M. Gondek,[4] T. Mogren,[5] M. Pinto da Costa[6–8]

[1]424 Military Hospital Thessaloniki,
[2]National Mental Health Center, Baku, Azerbaijan,
[3]Department of Psychiatry, Koc University Hospital, Istanbul, Turkey,
[4]Polish Psychiatric Association, Specialty Training Section, Wroclaw, Poland,
[5]Psychiatric Department if Falun, Säter, Sweden,
[6]Hospital de Magalhães Lemos, Porto, Portugal,
[7]Institute of Biomedical Sciences Abel Salazar (ICBAS), University of Porto, Porto, Portugal,
[8]Unit for Social and Community Psychiatry (WHO Collaborating Centre for Mental Health Services Development), Queen Mary University of London, London, United Kingdom

Introduction

In the past century, biological, psychological and social sciences have brought significant progresses to psychiatry, building it is a broad medical specialty, closely linked to somatic medicine, psychology and society. Many psychiatrists early in their career have understood that it is easier to face these challenges in a collaborative way, and therefore there has been in the last decades a growth of local and national associations of psychiatric trainees and early career psychiatrists across Europe.

In 2007, the European Psychiatric Association (EPA) has integrated in its program the "Young Psychiatrists Committee", an informal network of young psychiatrists. This Committee since 2010 has been known as the Early Career Psychiatrists Committee (ECPC).

EPA has been making remarkable efforts towards supporting early career psychiatrists' education and participation in scientific congresses, promoting their professional growth and integration into the international professional community. Likewise, early career psychiatrists contribute to EPA with their motivation, enthusiasm and creative ideas, proving this initiative as an effective win-win cooperation.

Why the Early Career Psychiatrists Committee?

You may consider joining the network of European Early Career Psychiatrists if you are a trainee in psychiatry, or if your work experience does not exceed 5 years from completion of professional training or your age is under 40. Your membership in the network will promote fruitful cooperation with other young psychiatrists sharing similar education and research interests. EPA promotes early career psychiatrists in developing networks, mentoring, and academic opportunities. Furthermore EPA provides

young psychiatrists with an opportunity to voice their opinions in regard to training, research and practice standards as well as empowering them in their professional development and career progress.

Activities

The ECPC activities include four task forces-research, publications, professional development, and meetings and associations.

The "Research Task Force" aims to promote international scientific projects in European countries and to facilitate young psychiatrists to develop research skills.

The "Publications Task Force" focuses on various online educational materials posted on the EPA official website. One major outcome has been the publication of two books written by early career psychiatrists.

The "Professional Development Task Force" cooperates with different organizations to hold courses, workshops, seminars and other educational activities. In addition, the Task Force conducts relevant surveys to assess young psychiatrists' needs.

Last, but certainly not the least, the "Task Force on Meetings and Associations" collaborates actively with other organizations such as the Early Career Psychiatrists Section of the World Psychiatric Association (WPA), the European Federation of Psychiatric Trainees (EFPT) and the Young Psychiatrists' Network (YPN), inviting ECPs to participate in the EPA Congress and in other collaborative professional meetings and events. It also represents the ECPC in meetings, such as the European Union of Medical Specialists (UEMS), and has been promoting ECPC activities in our partners' newsletters.

Opportunities

The ECPC objectives also include organizing a high-quality scientific track for early career psychiatrists within the annual EPA Congress, where young colleagues have the opportunity to share ideas, experiences and to inspire others. Also, since 2007 a scholarship programme has been initiated for European early careers psychiatrists, supporting their registration, travel and accommodation expenses.

ECPC is proud to promote the "Gaining Experience Programme", a short observership placement of between 2 to 8 weeks in various psychiatric institutions across Europe, offered to those that have finished their psychiatry training already, supporting with scholarships for those selected.

If you are an Early Career Psychiatrist, ECPC warmly invites you to join our network by subscribing to the Early Career Psychiatrists mailing list by contacting: ecpc@europsy.net. By doing so, you will receive information about our activities as well as other exciting projects and programmes aimed at early career psychiatrists. Further information is available at www.europsy.net/what-we-do/early-career-psychiatrists/.

Ποιες δυνατότητες έχουν οι Ευρωπαίοι ψυχίατροι στην έναρξη της σταδιοδρομίας τους;

Γ. Πάγκαλος,[1] J. Ismayilova,[2] O. Kilic,[3] T.M. Gondek,[4] T. Mogren,[5] M. Pinto da Costa[6–8]

[1]424 ΓΣΝΕ, Θεσσαλονίκη, Ελλάδα,
[2]Εθνικό Κέντρο Ψυχικής Υγείας, Μπακού, Αζερμπαϊτζάν,
[3]Ψυχιατρικό Τμήμα, Πανεπιστημιακό Νοσοκομείο Κοτς, Κωνσταντινούπολη, Τουρκία,
[4]Πολωνική Ψυχιατρική Εταιρεία, Τομέας Εκπαίδευσης Ειδικότητας, Βρότσλαβ, Πολωνία,
[5]Ψυχιατρικό Τμήμα Φαλούν, Σέτερ, Σουηδία,
[6]Νοσοκομείο Μαγκαλάες Λέμος, Πόρτο, Πορτογαλία,
[7]Ινστιτούτο Βιομετρικών Επιστημών Άμπελ Σάλαζαρ (ICBAS), Πανεπιστήμιο του Πόρτο, Πόρτο, Πορτογαλία,
[8]Μονάδα Κοινωνικής και Κοινοτικής Ψυχιατρικής (ΠΟΥ Συνεργατικό Κέντρο για την Ανάπτυξη των Υπηρεσιών Ψυχικής Υγείας), Πανεπιστήμιο του Λονδίνου Βασίλισσα Μαρία, Λονδίνο, Μεγάλη Βρετανία

Εισαγωγή

Κατά τον περασμένο αιώνα οι βιολογικές, ψυχολογικές και κοινωνικές επιστήμες οδήγησαν σε σημαντική πρόοδο την Ψυχιατρική, οικοδομώντας την σε μια ευρεία ιατρική ειδικότητα, στενά συνδεδεμένη με τη σωματική ιατρική, την ψυχολογία και την κοινωνία. Πολλοί ψυχίατροι στα αρχικά στάδια της σταδιοδρομίας τους έχουν κατανοήσει ότι είναι ευκολότερο να αντιμετωπίσουν τις προκλήσεις που συναντούν, με έναν συνεργατικό τρόπο και για τον λόγο αυτόν παρατηρείται τις τελευταίες δεκαετίες αύξηση των τοπικών και εθνικών ενώσεων ειδικευομένων ψυχιατρικής και νέων ψυχιάτρων σε όλη την Ευρώπη.

Το 2007 η Ευρωπαϊκή Ψυχιατρική Εταιρεία (European Psychiatric Association, EPA) ενσωμάτωσε στο πρόγραμμά της την «Επιτροπή Νέων Ψυχιάτρων» ως ένα άτυπο δίκτυο νέων ψυχιάτρων. Η επιτροπή αυτή από το 2010 είναι γνωστή ως Επιτροπή Ψυχιάτρων στην Έναρξη της Σταδιοδρομίας (Early Career Psychiatrists Committee, ECPC).

Η EPA κάνει σημαντικές προσπάθειες να στηρίξει τους νέους ψυχιάτρους στους τομείς της εκπαίδευσης και της συμμετοχής τους σε επιστημονικά συνέδρια, προωθώντας την επαγγελματική τους ανάπτυξη και την ένταξή τους στη διεθνή επαγγελματική κοινότητα. Αντίστοιχα, οι ψυχίατροι στην έναρξη της σταδιοδρομίας συνεισφέρουν στην EPA με την κινητοποίησή τους, τον ενθουσιασμό και τις δημιουργικές ιδέες αποδεικνύοντας τη συνεργασία αυτή ως κερδοφόρα και αποτελεσματική.

Γιατί η Επιτροπή Ψυχιάτρων στην Έναρξη της Σταδιοδρομίας;

Μπορείτε να ενταχθείτε στο δίκτυο των Ευρωπαίων Ψυχιάτρων στην Έναρξη της Σταδιοδρομίας εάν είστε ειδικευόμενος ψυχιατρικής ή η επαγγελματική σας εμπειρία δεν υπερβαίνει τα πέντε χρόνια από την ολοκλήρωση της επαγγελματικής εκπαίδευσής σας ή η ηλικία σας είναι κάτω των 40 ετών. Η ένταξή σας ως μέλος του δικτύου θα προωθήσει τη γόνιμη συνεργασία με άλλους νέους Ψυχιάτρους που μοιράζονται παρόμοια εκπαιδευτικά και ερευνητικά ενδιαφέροντα. Η EPA παροτρύνει τους Ψυχιάτρους στην Έναρξη της Σταδιοδρομίας στην ανάπτυξη δικτύων, καθοδήγησης και ακαδημαϊκών ευκαιριών. Επιπλέον η EPA παρέχει στους νέους ψυχιάτρους την ευκαιρία να ακουστεί η γνώμη τους σχετικά με την εκπαίδευση, την έρευνα και τα πρότυπα ιατρικής πρακτικής, καθώς επίσης συνεισφέρει στην ενδυνάμωση της επαγγελματικής τους εξέλιξης και την πρόοδο της καριέρας τους.

Δραστηριότητες

Οι δραστηριότητες της ECPC περιλαμβάνουν τέσσερεις ομάδες εργασίας-έρευνας, δημοσιεύσεων, επαγγελματικής εξέλιξης και συνεδρίων-εταιρειών.

Η «Ομάδα Εργασίας Έρευνας» στοχεύει στην προώθηση διεθνών επιστημονικών ερευνητικών προγραμμάτων στις Ευρωπαϊκές χώρες και στη διευκόλυνση των νέων ψυχιάτρων στην ανάπτυξη ερευνητικών δεξιοτήτων.

Η «Ομάδα Εργασίας Δημοσιεύσεων» επικεντρώνεται σε ποικίλα διαδικτυακά εκπαιδευτικά υλικά, τα οποία δημοσιεύονται στον επίσημο ιστότοπο της EPA. Ένα σημαντικό αποτέλεσμα είναι η δημοσίευση δύο βιβλίων με συγγραφείς Ψυχιάτρους στην Έναρξη της Σταδιοδρομίας.

Η «Ομάδα Εργασίας Επαγγελματικής Εξέλιξης» συνεργάζεται με διαφορετικούς Οργανισμούς για τη διοργάνωση μαθημάτων, εργαστηρίων, σεμιναρίων και άλλων εκπαιδευτικών δραστηριοτήτων. Επιπλέον, πραγματοποιεί σχετικές έρευνες για την αξιολόγηση των αναγκών των Νέων Ψυχιάτρων.

Τέλος, η «Ομάδα Εργασίας Συνεδρίων και Εταιρειών» συνεργάζεται ενεργά με άλλους Οργανισμούς, όπως ο Κλάδος Ψυχιάτρων στην Έναρξη της Σταδιοδρομίας της Παγκόσμιας Ψυχιατρικής Εταιρείας (ECP WPA), η Ευρωπαϊκή Ομοσπονδία Ειδικευομένων Ψυχιατρικής (EFPT) και το Δίκτυο Νέων Ψυχιάτρων (YPN), προσκαλώντας τους να συμμετάσχουν στο Συνέδριο της EPA, καθώς και σε άλλες επαγγελματικές συναντήσεις και εκδηλώσεις. Εκπροσωπεί, επίσης, την ECPC σε συναντήσεις, όπως της Ευρωπαϊκής Ένωσης Ειδικευμένων Ιατρών (UEMS), και προωθεί τις δραστηριότητες της ECPC στα ηλεκτρονικά ενημερωτικά δελτία των συνεργατών της.

Δυνατότητες

Οι στόχοι της ECPC περιλαμβάνουν την οργάνωση ενός επιστημονικού προγράμματος υψηλής ποιότητας στο πλαίσιο του ετήσιου Συνεδρίου της EPA για τους ψυχιάτρους στην αρχή της καριέρας τους, όπου νέοι συνάδερφοι έχουν την ευκαιρία να μοιραστούν ιδέες, εμπειρίες και να εμπνεύσουν άλλους συναδέλφους. Επίσης, από το 2007 ξεκίνησε ένα πρόγραμμα υποτροφιών για Ευρωπαίους Ψυχιάτρους στην Έναρξη της Σταδιοδρομίας, υποστηρίζοντας τα έξοδα εγγραφής, ταξιδιού και διαμονής τους στο Συνέδριο της EPA.

Η ECPC είναι υπερήφανη για την προώθηση του «Προγράμματος Απόκτησης Εμπειρίας», μιας βραχυχρόνιας τοποθέτησης παρατήρησης διαστήματος 2 έως 8 εβδομάδων σε ποικίλα Ψυχιατρικά Εκπαιδευτικά Ιδρύματα σε όλη την Ευρώπη, το οποίο προσφέρεται σε όσους νέους ψυχιάτρους έχουν ήδη ολοκληρώσει την ψυχιατρική τους εκπαίδευση, υποστηρίζοντας με υποτροφία αυτούς που επιλέγονται.

Εάν είστε Ψυχίατροι στην Έναρξη της Σταδιοδρομίας, η ECPC σας προσκαλεί θερμά να συμμετάσχετε στο δίκτυό της κάνοντας εγγραφή στη λίστα ηλεκτρονικής αλληλογραφίας της επικοινωνώντας στο: ecpc@europsy.net. Με τον τρόπο αυτόν θα ενημερώνεστε σχετικά με τις δραστηριότητες καθώς και άλλα συναρπαστικά ερευνητικά προγράμματα που απευθύνονται σε ψυχιάτρους στην αρχή της καριέρας τους. Θα αισθανθούμε ιδιαίτερη τιμή να διατηρήσετε επαφή μαζί μας. Περισσότερες πληροφορίες θα βρείτε στον ιστότοπο: http://www.europsy.net/what-we-do/early-career-psychiatrists/.

Bookreview
Βιβλιοκριτική

Addictions: etiology, mechanisms, manifestations, treatment (in greek)

T. Paparrigopoulos, C. Dalla (editors)
Publisher: Crete University Press, 2018

Addictions is a multifaceted topic and this is reflected in the relevant literature. Many of the existing specialized textbooks, even those intended for educational use, focus on one aspect, such as clinical knowledge, neurobiological underpinnings and pharmacology, psychological causal factors, psychotherapy and other psychosocial therapies. A coherent and concise textbook that contains comprehensive and up-to-date information on addictions is a particularly difficult but useful undertaking. The book "Addictions: etiology, mechanisms, manifestations, treatment" edited by T. Paparrigopoulos and C. Dalla and published in 2018 by Crete University Press, attempts to meet these specifications. Overall, the project was successful. Up-to-date evidence on the various forms of addiction is given in a conceivable way, rendering this book particularly useful for psychiatrists, psychologists, and other mental health professionals.

The book offers general knowledge on the phenomenon of addiction, treatment and related issues, and also specific knowledge on each category of substances of abuse and the related mental disorders. Each chapter was written by scientific and / or clinical experts of the field. Shared view of those contributing to the book from different scientific disciplines and therapeutic approaches is important for its consistency. The authors adopt the modern view of addiction as a psychopathological condition with a common neural substrate, related to hedonistic seeking and reward, in which both environmental and biological factors contribute.

More specifically, the first chapters of the book include an interesting historical overview on the use of psychotropic substances and the observations on abuse and dependence, comprehensive presentations of the clinical syndromes and the modern diagnostic criteria, of the interactive, biological and psychosocial, etiological factors, and of the pathophysiological mechanisms.

The next 8 chapters present the main categories of substances: alcohol, nicotine, prescription drugs, cannabis, opioids, psychostimulants, hallucinogens, and new psychotropic substances, including new synthetic drugs and legal highs, the newest phenomenon in the narcotics market and in the epidemiology of drug abuse. Important current knowledge is offered in the chapter on behavioral addictions. The psychological and neurobiological background of addiction is the same for behaviors not involving substance use, which also result in similarly dysfunctional mental conditions. The book presents the gambling and internet use disorders, but it is well known that within the same clinical spectrum there is ongoing investigation on addiction in other behavioral domains – e.g. sexual behavior, eating behavior.

The remaining chapters deal with the therapeutic models – treatment programs, toxicological detection of drugs, policies for the problem in Europe and Greece, and related legal and ethical issues. Broader knowledge on treatments is needed of course for the clinicians, especially for practitioners intended to work with addictions. A short textbook could not include much more on treatments beyond the intervention strategies. Special manuals are needed for training on treatments.

In conclusion, Paparrigopoulos and Dalla's book is an important contribution to the literature on addictions and a very useful educational source for students and professionals in the field of mental health.

G. Konstantakopoulos

Psychiatrist, Research Associate, 1st Department of Psychiatry, University of Athens & Institute of Psychiatry, Psychology and Neuroscience, King's College London

Οι εξαρτήσεις: αίτια, μηχανισμοί, εκδηλώσεις, αντιμετώπιση

Θ. Παπαρρηγόπουλος, Χ. Δάλλα (επιμέλεια)
Εκδόσεις: Πανεπιστημιακές Εκδόσεις Κρήτης, 2018

Το θέμα των εξαρτήσεων είναι πολύπλευρο και αυτό αντανακλάται και στην απόδοσή του στη σχετική βιβλιογραφία. Πολλά από τα υπάρχοντα ειδικά συγγράμματα, ακόμα και τα προοριζόμενα για εκπαιδευτική χρήση, επικεντρώνονται σε μία πλευρά του, όπως στα κλινικά δεδομένα, στη νευροβιολογική βάση και στη φαρμακολογία, σε ψυχολογικούς παράγοντες πρόκλησης και διαιώνισης, στην ψυχοθεραπεία και σε άλλες ψυχοκοινωνικές θεραπευτικές παρεμβάσεις. Ένα συνεκτικό και συνοπτικό σύγγραμμα, το οποίο να περιέχει σφαιρική και σύγχρονη πληροφορία για τις εξαρτήσεις, είναι ένα ιδιαίτερα δύσκολο όσο και αναγκαίο εγχείρημα. Σε αυτές τις προδιαγραφές επιχειρεί να ανταποκριθεί το βιβλίο «Οι εξαρτήσεις: αίτια, μηχανισμοί, εκδηλώσεις, αντιμετώπιση» με επιμέλεια Θωμά Παπαρρηγόπουλου και Χριστίνας Δάλλα, που εκδόθηκε το 2018 από τις Πανεπιστημιακές Εκδόσεις Κρήτης. Γενικά το εγχείρημα είναι επιτυχημένο. Με εύληπτο τρόπο αποδίδονται τα κυριότερα σύγχρονα δεδομένα για τις διάφορες μορφές εξάρτησης και γι' αυτό το βιβλίο είναι ιδιαίτερα χρήσιμο σε ψυχιάτρους, ψυχολόγους και άλλους επαγγελματίες ψυχικής υγείας.

Στην ύλη του βιβλίου περιλαμβάνονται αφενός γενικές γνώσεις για την εξάρτηση ως φαινόμενο, τη θεραπευτική αντιμετώπιση και συναφή θέματα, αφετέρου ειδικές γνώσεις για κάθε κατηγορία εθιστικών ουσιών και αντίστοιχων ψυχικών διαταραχών σχετιζόμενων με τη χρήση τους. Το κάθε κεφάλαιο έγραψαν ειδικοί με επιστημονικό ή/και κλινικό έργο επί των σχετικών θεμάτων. Σημαντικό για τη συνοχή του βιβλίου είναι η κοινή αντίληψη όσων συνεισφέρουν σε αυτό από διαφορετικούς επιστημονικούς κλάδους και θεραπευτικές προσεγγίσεις. Οι συγγραφείς υιοθετούν τη σύγχρονη θεώρηση της εξάρτησης ως μία ψυχοπαθολογική κατάσταση με σύστοιχο εγκεφαλικό υπόβαθρο, σχετιζόμενο με την ηδονική αναζήτηση και ανταμοιβή, στην εμφάνιση της οποίας συμβάλλουν τόσο περιβαλλοντικοί όσο και βιολογικοί παράγοντες.

Πιο συγκεκριμένα, τα πρώτα κεφάλαια του βιβλίου περιλαμβάνουν μια ενδιαφέρουσα ιστορική αναδρομή στη χρήση ψυχοτρόπων ουσιών και στην παρατήρηση των φαινομένων κατάχρησης κι εξάρτησης, περιεκτικές παρουσιάσεις των κλινικών συνδρόμων εξάρτησης και των σύγχρονων διαγνωστικών κριτηρίων, των αλληλοεπιδρώντων, βιολογικών και ψυχοκοινωνικών, αιτιοπαθογενετικών παραγόντων, των παθοφυσιολογικών μηχανισμών εγκατάστασης και διαιώνισης.

Τα επόμενα 8 κεφάλαια αφορούν στις βασικές κατηγορίες εθιστικών ουσιών: αλκοόλ, νικοτίνη, συνταγογραφούμενα φάρμακα, κάνναβη, οπιοειδή, ψυχοδιεγερτικά, παραισθησιογόνα και νέες ψυχοδραστικές ουσίες εξάρτησης, όπου περιλαμβάνονται τα νέα συνθετικά ναρκωτικά και οι διάφορες, συνθετικής ή φυτικής προέλευσης, «νόμιμες» ψυχοτρόπες ουσίες (legal highs), το νεότερο φαινόμενο στην αγορά και την επιδημιολογία των ναρκωτικών. Μία ακόμη σημαντική επέκταση του θέματος συνιστά το κεφάλαιο για τις συμπεριφορικές εξαρτήσεις. Το ψυχολογικό και νευροβιολογικό υπόβαθρο του εθισμού είναι το ίδιο και για συμπεριφορές που δεν περιλαμβάνουν χρήση ουσιών αλλά έχουν ως αποτέλεσμα παρόμοια δυσλειτουργική ψυχική κατάσταση. Στο βιβλίο εκθέτονται οι ψυχικές διαταραχές στοιχηματοπαιξίας και χρήσης του διαδικτύου, αλλά είναι γνωστό ότι σε αυτό το φάσμα διερευνάται ο εθισμός και σε άλλα πεδία συμπεριφορών, της σεξουαλικής, της διατροφικής κ.ά.

Τα υπόλοιπα κεφάλαια αφορούν στα θεραπευτικά μοντέλα-προγράμματα, στην τοξικολογική ανίχνευση εθιστικών ουσιών, στις πολιτικές αντιμετώπισης του προβλήματος των ναρκωτικών σε Ευρώπη και Ελλάδα και στα σχετικά νομικά και δεοντολογικά ζητήματα. Φυσικά στα θέματα σχετικά με τη θεραπευτική αντιμετώπιση, πολύ ευρύτερη γνώση χρειάζεται στον κλινικό, ειδικότερα σε επαγγελματίες που θα ασχοληθούν με αυτή. Ωστόσο, πέραν των στρατηγικών ζητημάτων, δεν θα ήταν εφικτό να επεκταθεί κατά πολύ στη θεραπεία ένα επίτομο και σύντομο σύγγραμμα. Για τις σχετικές θεραπείες χρειάζονται ειδικά εγχειρίδια.

Εν κατακλείδι, το βιβλίο των κ. Παπαρρηγόπουλου και Δάλλα αποτελεί μια σημαντική προσθήκη στη βιβλιογραφία του πεδίου των εξαρτήσεων και ένα πολύ χρήσιμο εκπαιδευτικό υλικό για φοιτητές και επαγγελματίες στον χώρο της ψυχικής υγείας.

Γ. Κωνσταντακόπουλος
Ψυχίατρος, Επιστημονικός Συνεργάτης Α΄ Ψυχιατρικής Κλινικής Πανεπιστημίου Αθηνών & Institute of Psychiatry, Psychology and Neuroscience, King's College London