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ORIGINAL PAPER

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Physical and Mental Health Level of the Elderly Living in Central Greece

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ABSTRACT

Introduction: Elderly population is growing fast in the western world due to a reduction in birth rates and a marked increase in life expectancy with multiple co-morbidity that warrants greater attention by health care workers. **Aim:** The purpose of the study is to investigate the levels of physical and mental health of elderly people living in Central Greece. **Methods:** A cross-sectional study design was adopted with self completed questionnaires. Data collected, included socio-demographic and general health information using the Greek version of General Health Questionnaire 28. Kolmogorov-Smirnov test and regularity diagrams were employed. **Results:** The sample included 230 elderly people with an average age of 73.1 years, women (53.5%), married (75.7%), with children (100%), primary school graduates (47.8%), residing in a city (72.2%), retired (90.9%), living with a spouse (68.3%), worked previously (96%) and 37.4% with a present monthly income of 301-600€. In the General Health Questionnaire, the internal consistency factor Cronbach's alpha for 'physical depressive symptoms' was 0.85, for 'anxiety and insomnia' 0.86, for 'social dysfunction' 0.86 and for 'depressive sentiment' 0.89, which indicates an excellent reliability of the questionnaire. The 'social malfunction' sub-scale showed the highest score (8.9) then 'anxiety and insomnia' (6.9) followed by 'physical symptoms of depression' (6.2) and 'depressive sentiment' (3.4). For the 'anxiety and insomnia' sub-scale, marital status shows another important correlation: unmarried elderly people had higher levels of stress. A lower educational level was associated with higher levels of anxiety and insomnia. Marital status appears to affect the manifestation of depressive symptoms as widows, singles and divorced showed a higher mean rate

of depression than married people. **Conclusions:** Various demographic as well as bio-psycho-social factors affecting health and particularly mental health are distributed unevenly between older men and women and between older people living in urban and rural areas. Therefore as our findings show, special care and priority should be granted to those who are single or widowed or divorced as they seem to be at greatest risk for overall declining mental health.

Keywords: elderly, aging, general health, mental health.

1. INTRODUCTION

Elderly population is growing fast in the western world due to a reduction in birth rates and a marked increase in life expectancy (1, 2). Nevertheless, between 2015 and 2050, the proportion of the world's population over 60 years of age will almost double, from 12% to 22% (3). With regards to the proportion of those 65 and over in the European Union, in 2018, the highest rates are found in Italy (22.6%), and Greece (21.8%), while Ireland has the lowest rate (13.8%) (4). According to the World Health Organization (WHO) over 20% of adults over 60 years of age suffer from some form of mental or neurological disorder. The most common being dementia and depression which affect about 5% and 7% of the elderly population worldwide, respectively. Anxiety disorders affect 3.8% of the elderly population, problems with substance abuse affect almost 1% and about a quarter of deaths from self-harm are among people aged 60 and over (3).

Older people generally face various challenges associated with physical and psycho-

logical changes usually associated with the aging process. Although these changes are considered by many to be normal and acceptable in the elderly, there are some aspects of mental health that are pathological and need to be recognized and addressed early, especially those that lead to emotional instability and various degrees of depression (5). It should also be noted that mental health has an impact on physical health and vice versa.

In this context, people with one or more chronic illnesses often experience many psychological disorders, ranging from depressive symptoms to major psychiatric disorders due to direct hormonal or neurological endocrine effects, or as a side effect of medication or even to polypharmacy per se (6). Older adults with heart disease have higher rates of depression than those who are healthy. In addition, untreated depression in an elderly person with cardiac disease may negatively affect its clinical outcome (3).

2. AIM

The purpose of the study is to investigate the levels of physical and mental health of elderly people living in a province of Central Greece and also to explore how they are affected by demographic and social factors.

3. METHOD AND MATERIALS

For this study's needs, a cross-sectional study was adopted with self-completed questionnaires.

Participants: Questionnaires were distributed to 230 elderly residing in the community; 107 males and 123 females. The criteria for entering this study were as follows: participants to be 65 years or over, be able to understand and write in the Greek language and reside permanently in the Magnesia Prefecture, Central Greece. The sample were initially informed of the purpose of the work and its investigative nature and subsequently provided written consent to participate in the research.

Data Collection: The questionnaire consisted two parts. The first part deals with socio-demographic and educational information. The elderly surveyed were asked about their gender, age, marital status, the number of children they have, their educational level, place of residence, pension institution, profession, possibility of staying with a family member and their monthly income.

The second part consisted of an evaluation of the participants' General Health using the General Health Questionnaire 28 (GHQ-28). The GHQ-28 was originally developed by Goldberg in 1978 and subsequently validated for a Greek population by Garyfallos et al. (1991) and has been widely used since in various Greek samples with satisfactory validity and reliability (7,8). GHQ-28 consists of 28 questions, which refer to four dimensions: 'physical disturbances', 'anxiety', 'social function' and 'depression'. Overall, for the assessment of mental disorder there is a cut-off point of 4/5 i.e. total score ≤ 4 which indicates that there is no mental morbidity, while an overall score ≥ 5 suggests that there is a mental issue. In addition, the questionnaire allows a separate assessment of the four dimensions. In the individual subscales, higher scores indicate higher levels of these abnormalities (8). It takes about 10 minutes to

complete the questionnaire, ideal time for elderly people who generally seemed unwilling to respond to large and complex questionnaires.

Data Analysis

The categorical variables are presented as absolute (n) and relative (%) frequencies, whereas the quantitative variables are presented as mean, standard deviation, median, minimum value and maximum value. Kolmogorov-Smirnov test and regularity diagrams were used to check for normal distribution of quantitative variables. The independent variables were demographic characteristics, while the dependent variables were the scores of the GHQ per se.

The following variable associations were originally performed to determine separately whether each independent variable is associated with each dependent variable. The selection of the appropriate statistical control was based on the type of variables (quantitative or categorical) and whether the quantitative variables followed the normal distribution or not. In particular, the t-test was used to investigate the existence of a relationship between a quantitative variable that followed the normal distribution and a dichotomy variable. Analysis of variance was used to investigate a possible existence of a relationship between a quantitative variable that followed the normal distribution and a categorical variable with more than two categories.

The Pearson's correlation coefficient was used to investigate the existence of a relationship between two quantitative variables following the normal distribution. The Spearman's correlation coefficient was used to investigate the relationship between a quantitative variable following the normal distribution and an interchangeable variable.

A variant analysis with a dependent variable was then carried out with the scores so as to determine the independent role of each variable in the scores. Thus, the multivariate analysis neutralized possible confounding effects. If >2 independent variables produced statistically significant at $p < 0.2$ in the variable analysis, multiple linear regression (multivariate linear regression) with dependent variable was applied to the scores. In this case, the multiple linear regression method was applied by backward deletion of the variables (backward step-wise linear regression). For multi-linear regression, coefficients beta, the corresponding 95% confidence intervals and p values are presented. The bilateral level of statistical significance was set at 0.05. Data analysis was performed with IBM Statistical Package for Social Sciences 21.0.

4. RESULTS

Demographic characteristics

Our sample included 230 elderly people with an average age of 73.1 years. The demographic characteristics of the elderly are shown in Table 1. As for the sample's characteristics, the majority were women (53.5%), married (75.7%), had children (100%), primary school graduates (47.8%), residing in a city (72.2%), retired (90.9%), living with a spouse (68.3%), worked previously (96%) and 37.4% had a present monthly income of 301-600€ (Table 1).

General health

In the General Health Questionnaire, the internal consistency factor Cronbach's alpha for the 'physical depressive

| Demographics | N | % |
|---------------------------|-------------------|------------------|
| Gender | | |
| Men | 107 | 46,5 |
| Women | 123 | 53,5 |
| Age | 73,1 ^a | 6,3 ^b |
| Marital status | | |
| Single | 8 | 3,5 |
| Married | 174 | 75,7 |
| Divorced | 11 | 4,8 |
| Widowers | 37 | 16,1 |
| Children | | |
| 1 | 23 | 10 |
| 2 | 130 | 56,5 |
| 3 | 55 | 23,9 |
| 4 | 21 | 9,1 |
| 5 | 1 | 0,4 |
| Educational level | | |
| None | 3 | 1,3 |
| Primary (partial) | 13 | 5,7 |
| Primary | 110 | 47,8 |
| Secondary | 66 | 28,7 |
| Tertiary | 38 | 16,5 |
| Place of residence | | |
| City | 166 | 72,2 |
| Town | 26 | 11,3 |
| Village | 38 | 16,5 |
| Pension | | |
| Public servant | 59 | 25,7 |
| Farmer | 61 | 26,5 |
| Labor | 61 | 26,5 |
| Free lance worker | 16 | 7 |
| Other | 12 | 5,2 |
| None | 21 | 9,1 |
| Residence | | |
| Living alone | 43 | 18,7 |
| Living with spouse | 157 | 68,3 |
| Living with children | 30 | 13 |
| Occupation | | |
| Labor | 70 | 30,4 |
| Non-labor | 83 | 36,1 |
| Farmer | 38 | 16,5 |
| Housework | 34 | 14,8 |
| None | 5 | 3,2 |
| Monthly income (€) | | |
| 0-300 | 23 | 10 |
| 301-600 | 86 | 37,4 |
| 601-1000 | 67 | 29,1 |
| >1000 | 54 | 23,5 |

Table 1. Demographical characteristics of the elderly. ^a mean, ^b standard deviation

symptoms' scale was 0.85, for the 'anxiety and insomnia' scale it was 0.86, for the 'social dysfunction' scale it was

| Sub-scale | Mean | Standard deviation | Median |
|-------------------------------------|------|--------------------|--------|
| Physical Depressive symptoms [0-21] | 6,2 | 4,4 | 5 |
| Anxiety and Insomnia [0-21] | 6,9 | 4,6 | 6 |
| Social dysfunction [0-21] | 8,9 | 4,0 | 8 |
| Depressive feelings [0-21] | 3,4 | 4,3 | 1 |
| Overall scores [0-84] | 25,3 | 13,9 | 23 |

Table 2. Descriptive results of the GHQ-28 sub-scales.

also 0.86 and for the 'depressive sentiment' scale it was 0.89, which indicates an excellent reliability of the questionnaire.

The descriptive results of the scales are shown in Table 2. The highest scores of GHQ were for the 'social dysfunction' sub-scale, followed by the scores on the 'stress and insomnia' sub-scale and on the 'physical symptoms of depression' sub-scale, while the last one was the 'depressive sentiment' sub-scale for better health.

Associations: The independent variables were demographic characteristics, while the dependent variables were the scores of the General Health Questionnaire.

Dependent variable: Physical Depression Symptom Score

The variable analysis showed a statistical relationship at the level of 0.20 ($p < 0.20$) between 9 independent variables and the physical depressive symptom score. According to the results of the linear regression variant (Table 3), the following results are recorded as:

- Single/divorced/widowed had more physical depressive symptoms than married ($p = 0.008$).

- Elderly people permanently living in a village had more physical depressive symptoms than elderly people permanently living in a town ($p = 0.019$).

- Advanced age was associated with an increase in physical depression symptoms ($p = 0.005$).

Dependent variable: Stress and Insomnia Score

The variable analysis showed a statistical relationship at the level of 0.20 ($p < 0.20$) between 7 independent variables and the stress and insomnia score. According to the analysis of the linear regression variant (Table 3) the following results are obtained:

- Single/divorced/widowed had more anxiety and insomnia than married ($p < 0.001$).

- The lowest educational level was associated with more anxiety and insomnia ($p = 0.003$).

Dependent variable: Social Dysfunction Score

The variable analysis established a statistical relationship at the level of 0.20 ($p < 0.20$) between 8 independent variables and the social dysfunction score. According to the analysis of the linear regression variant (Table 3) the following results are:

- Lower income was associated with greater social dysfunction ($p = 0.001$).

- Age increase was associated with increased social dysfunction ($p < 0.001$).

Dependent variable: Depressive Sentiment Score

The variable analysis showed a statistical relationship at the level of 0.20 ($p < 0.20$) between 7 independent variables and the depressive sentiment score. According to the analysis of the linear regression variant (Table 3) the following results are:

| Dependent variable | Independent variable | b coefficient | 95% confidence interval for b | p value |
|------------------------------|---|---------------|-------------------------------|---------|
| Physical Depressive symptoms | Unmarried/divorced/widowers and married | 1,7 | 0,5 to 2,9 | 0,008 |
| | Age | 0,1 | 0,02 to 0,2 | 0,019 |
| | Village/city/town | 1,1 | 0,4 to 1,9 | 0,005 |
| Anxiety and Insomnia | Unmarried/divorced/widowers and married | 2,2 | 0,9 to 3,5 | 0,001 |
| | Education | -1,1 | -1,8 to -0,4 | 0,003 |
| Social dysfunction | Income | -0,9 | -1,3 to -0,3 | 0,001 |
| | Age | 0,2 | 0,1 to 0,3 | <0,001 |
| Depressive feelings | Income | -1,3 | -1,9 to -0,8 | <0,001 |
| | Village/city/town | 0,2 | 0,1 to 0,3 | <0,001 |

Table 3. Linear multivariate regression analysis of the four GHQ-28 sub-scales.

- Lower income was associated with a stronger depressive sentiment ($p < 0.001$).
- Elderly people permanently living in a village showed greater depression than those permanently living in a town ($p < 0.001$).

5. DISCUSSION

According to the scores obtained by the participants for the four scales of the questionnaire, it appears that the 'social malfunction' sub-scale showed the highest score (8.9) followed by 'anxiety and insomnia' (6.9) followed by 'physical symptoms of depression' (6.2) and 'depressive sentiment' (3.4). Similarly, in a study on the state of mental health and its related factors of self-serving elderly people in Japan, the scale of physical symptoms appears to be the highest, followed by the range of anxiety insomnia, social dysfunction, with the lowest sub-scale for depressive sentiment (9). The results obtained from the dependant/independent variable correlations of the questionnaire indicate that a single, divorced or widowed participant had more physical depressive symptoms. In this light, the conclusions of a post-analysis by Yan et al (2011) that compared married elderly people, widowed elderly, divorced persons and never married people, presented a higher risk of depression (10). Furthermore, elderly people living in a village had more physical symptoms of depression than those living permanently in the city. Moreover, comparative studies concerning elderly people living in rural and urban areas in China (Dan et al., 2012) and Canada indicate that the risk of depression is greater in elderly people living in rural areas (11,12).

The fact that in women the average score of physical symptoms of depression and depressive sentiment is higher than in men shows that older women have lower levels of mental health than men. Similar results were presented by Carayanni et al (2012) in a survey conducted in the Centers for the Open Protection of the Elderly (CAPI) in Greece and by El-Gilany et al (2018) in a study of the elderly conducted in urban and rural areas in Egypt (13,14).

For the 'anxiety and insomnia' sub-scale, marital status shows another important correlation: unmarried elderly

people had higher levels of stress. A study in the USA shows that the chances of a higher level of depression were greater in single men and women than in married women (15). In addition to this, the education aspect is also substantial, i.e. a lower educational level was associated with higher levels of anxiety and insomnia. The results of the Bishop & Martin survey (2007) in the elderly in the US show that the greatest educational achievement in the past seems to be directly related to less neurosis and anxiety. A study in Egyptian elderly people showed that the educational level seems to be significantly related to insomnia. Older people with higher education slept shorter hours than those with lower educational levels. Finally, many more studies indicate the relationship between lower educational level and an increased risk of

insomnia (16,17,18,19,20).

Marital status appears to affect the manifestation of depressive symptoms with widows, singles and divorced showing a higher mean rate of depression than married people. The Zhou & Hearst study (2016) found that the quality of life with regards to mental states is worse in the elderly who have been widowed (21).

Our results also indicate that the place of residence affects the general health of older people. The levels of social dysfunction are clearly lower for people living in a city than for those living in a village. Yet, in a study by El-Gilany et al., (2018) it seems that Egyptian elderly people living in a city have lower quality of life than elderly people living in rural areas (14). International research findings show that a low income for older people is related to poor general health. The study by Ng et al (2014) confirms the correlation between a low income and the occurrence of depressive symptoms of the elderly in Singapore (22). In addition, the study shows that a lack of social welfare also contributes significantly to the worsening of depressive symptoms. Han et al (2018) found a similar correlation between the socio-economic situation of elderly people living in old people's homes in Korea (23).

The study by Talarska et al., (2018) looked at the overall quality of life of older people in Slovenia, including social, economic, demographic and functional factors as in our study. Their findings suggest that the worse quality of life is found to be amongst widowed, divorced or single elderly people compared to married ones. Moreover, these results are confirmed by a study in Indian elderly (24,25).

Several studies focus mainly on the impact of factors such as age, gender, education, income and the presence of diseases. The study of Khaje-Bishak et al., (2014) (26) showed that social dysfunction affects the mental health of the elderly for the worse in a study population in Iraq and this is also applies to a study by Baernholdt et al., (2012) on an American sample (26,27).

For the 'anxiety and insomnia' sub-scale, marital status showed another correlation. Those who have never been married experienced higher stress levels. In addition to this, an education aspect is added, i.e. a lower educational

level was associated with higher levels of anxiety and insomnia. The results of the Bishop & Martin survey (2007) in the elderly in the US show that the greatest educational achievement in the past seems to be directly related to less neurosis and anxiety in later life (16).

6. CONCLUSIONS

The study shows that various demographic as well as bio-psycho-social factors affecting health and particularly mental health are distributed differently, on the one hand, between older men and women and, on the other, between older people living in urban and rural areas.

Understanding these is essential for health professionals in the design and implementation of health programs which, following a holistic approach, will respond to the economic and social needs of older people. Specific interventions should be aimed at caring for elderly people who may be at risk of developing depression. As our findings have shown, special care and priority should be given to those who are single or widowed or divorced as they seem to be at greatest risk for overall declining mental health.

- **Patient Consent Form:** All participants were informed about the study's subject, and the ethical and research committee of royal medical services approved conducting and publishing the data.
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