# Exploring Social Support, Pain Self-Efficacy and Health Beliefs in Older Adults with Musculoskeletal Disorders

**Anyfantopoulou E and Theofilou P** [iD] *

Hellenic Open University, School of Social Sciences, Patra, Greece

***Corresponding author:** Paraskevi Theofilou, Hellenic Open University, School of Social Sciences, Patra, Greece

## Abstract

**Background:** During the last decades, many studies have explored social support, pain self-efficacy, and health beliefs in older adults with musculoskeletal disorders.

**Aim:** The purpose of the research is to investigate the beliefs of elderly people with musculoskeletal disorders regarding social support, self-efficacy in pain, and health locus of control.

**Methods:** The research was carried out based on 3 questionnaires. The first questionnaire involved the Multidimensional Scale of Perceived Social Support, the second involved the Pain Self Efficacy Questionnaire, and the third included the Multidimensional Health Locus of Control (MHLC) scale. The research was conducted from April–June 2023 among 106 elderly people, of which 32 (30.2%) were men and 74 (69.8%) were women, members of long-term care services and others who visited the Open Care Center of Patras.

**Results:** The mean age of the participants was 76.1 years and the majority were females, primary school graduates, and retired. Furthermore, most of them had moderate/mild manual labor, average financial status, and received medication for musculoskeletal problems. The results showed that there is a statistically significant positive correlation between pain self-efficacy and the support from the significant others ($r = .370$, $p < .01$), family support ($r = .517$, $p < .01$), overall social support ($r = .435$, $p < .01$), and financial status ($r = .353$, $p < .01$).

**Conclusion:** The research showed that social support is positively related to pain self-efficacy in the elderly with musculoskeletal diseases.

**Keywords:** elderly, musculoskeletal disorders, social support, pain, self-efficacy, health beliefs

## 1. Introduction

The impact of aging on the musculoskeletal system is crucial, affecting the person's mobility. Musculoskeletal aging is a complex process in which a significant decrease in bone and muscle mass, loss of height, reduction of muscle flexibility, alterations in joints and connective tissues, as well as a decline in nerve function is gradually observed [1]. The basic metabolic rate decreases by 4% after the age of 50 due to a multitude of hormonal and immune factors, such as decreasing levels of testosterone, glucocorticoids, cytokines, and growth hormone, thus disrupting the normal balance between muscle breakdown and synthesis. Also, the lack of important minerals, such as calcium, creates a vulnerability to bone fractures, especially in women [2].

The most serious pathological conditions that occur due to musculoskeletal aging are osteoarthritis, osteoporosis, and sarcopenia leading to functional limitations, falls, fractures, and disability and are characterized by increased risk mortality [3, 4]. According to research that was conducted in China with the participation of 4,000 people over 65 years of age, the back is the most common site of pain in 48% with osteoarthritis and osteoporosis as the most common causes, while women appear to have twice the prevalence compared to men. Also, musculoskeletal pain was strongly associated with functional and psychological impairment [5]. Fatigue, reduced muscle strength, and endurance, as well as chronic pain, have a negative effect on the individual's autonomy by increasing the need for care from a "third" person, while in addition, they cause a reduction in their social interactions, low self-esteem, and mental decline [1]. Small- and large-scale studies have confirmed that pain is one of the most important predictors of depression in people with rheumatoid arthritis [6]. Furthermore, older people experiencing

musculoskeletal disorders seem to have a low quality of life and increasingly turn to the care units resulting in increased costs for healthcare systems. In fact, with the steep increase in life expectancy and the corresponding increase in the percentage of the population belonging to the Third Age, it is estimated that in the coming years, there will be a large increase in the number of people suffering from musculoskeletal disorders [7].

Over the past few decades, the science of gerontology has focused strongly on social support. In recent research in different cultures and contexts, it has been shown that social support is significantly related to health and well-being, especially, in the Third Age. During the transition to the Third Age, social support undergoes changes with older adults, reporting fewer friendships and social relationships compared to younger adults [8, 9]. Based on research, loneliness prevails in the elderly at a rate of over 43% and it is a precursor of undesirable conditions, such as mortality [10], while it has been shown that the occurrence of chronic pain is closely related to loneliness and social isolation [11, 12]. Another study in older adults showed that reduced social support was associated with higher rates of pain intensity [13]. A study of 206 people suffering from multiple sclerosis found that those who received social support from family and friends had better physical and mental health, as well as social and emotional health function [14], while findings of other studies on patients with the same condition showed that they adapt better to their disease and that their quality of life improves noticeably [15]. Also, a study in patients with musculoskeletal conditions showed that social support has the benefit of lower levels of depression [16]. Additionally, from research conducted on 176 people who suffered from rheumatoid arthritis, it was observed that providing high-level emotional and social support resulted in lower psychological distress [17]. Another study of 127 patients with the same condition showed that the quality of social support is directly related to their quality of life [18].

The term locus of control refers to the degree to which the individual considers that the control over various issues concerns him or herself (internal focus) or others (external focus). The concept of locus of control was developed by Rotter [19, 20] through social learning theory, according to which the individual learns by developing expectations based on personal experiences and encouragement. The individual through the process of learning, builds the belief that a specific outcome of a behavior is the result of his actions or of other independent factors. The locus of control can be either internal (abilities, decisions, effort) or external (luck, fate, significant others) [21]. This term is also extended to health issues, such as locus of control regarding health (health locus of control) [22].

The purpose of this research is to study the opinions of elderly people with musculoskeletal health problems on pain self-efficacy, perceived social support, and health beliefs. The main research hypothesis is that there will be a statistically significant correlation between perceived social support and health beliefs to pain self-efficacy.

## 2. Methods

For the purpose of the research, a sample of 110 elderly people with musculoskeletal health problems was collected. From this cohort, 106 patients provided full data on the variables studied, while the remaining 4 patients were excluded having missing/incomplete data which could be probably explained by advanced age (mean age of 76.1). As an exclusion criterion, it was chosen to exclude elderly people with other significant health problems. The sample was collected during April–June 2023 and it included beneficiaries of the program "Help at Home" and the Elderly Care Unit Center (K.A.P.H) in the area of Patras. The participants were informed about the purpose of the research, as well as the absolute assurance of their anonymity. They were also informed that their participation is purely voluntary and they can discontinue at any time they wish, while they can still receive the results of the survey once it is completed. The present study was approved by the Institutional Review Board (IRB) of the program "Help at Home" and the Elderly Care Unit Center (K.A.P.H) in the area of Patras (approval number 2156/2023-5-31).

For the implementation of the research, a semi-structured questionnaire was used which includes five different sections:

A) The first section concerns the demographic data of the sample (sex, age, marital status, number of children, education level, professional status, type of professional work, number of family members in the same household, paid/unpaid helper, financial status, place of residence, and insurance cover).

B) The second section concerns the state of health (duration of treatment of musculoskeletal health problems, taking medication for the treatment of musculoskeletal health problems, duration of reception of medicines to treat musculoskeletal health problems, and severity of musculoskeletal health problems).

C) The third section concerns perceived social support (Multidimensional Scale of Perceived Social Support - MSPSS) [23]. The scale includes 12 questions (1 = strongly disagree to 7 = strongly agree) which are divided into three sub-dimensions: Support from significant other (1, 2, 5, & 10) (Cronbach's alpha = .876), support from the family (3, 4, 8 & 11) (Cronbach's alpha = .930), support from friends (6, 7, 9, & 12) (Cronbach's alpha = .964). For the overall scale of perceived social support, the reliability index Cronbach's alpha = .890. The score for each scale is calculated by finding the average of the questions

included in each section. The translation - cultural adaptation into Greek was done by Theofilou [24].

D) The fourth section concerned the self-efficacy in pain (Pain Self-Efficacy Questionnaire - PSEQ) [25] of the respondents and included 10 questions (0 = not at all sure to 6 = completely sure). The scale score was calculated by summing all questions with a score range of 0–60 (Cronbach's alpha = .945). The translation - cultural adaptation into Greek was done by Theofilou et al. [26].

E) The fifth and last section included 18 questions (1 = strongly disagree to 6 = strongly agree) on the Multidimensional Health Locus of Control (MHLC) scale [22]. The questionnaire has four dimensions: internal, chance, doctors, and important others.

Analysis was performed using descriptive statistics and inductive statistics. Descriptive statistics captured the demographics of the sample, as well as their responses to the core survey section. In addition, through inductive statistics, the relationships between the variables were examined. For this purpose, the Pearson index statistical test and t-test were used. The statistical programs IBM SPSS v.22.0 and Microsoft Office Excel were used for the analysis.

## 3. Results

In the present research, as shown in the table **(Table 1)**, 106 elderly people with musculoskeletal diseases participated, of which 32 (30.2%) were men and 74 (69.8%) were women. The majority of the sample, that is, 39.6% have an elementary education, while 23.6% have a high school education, 17.0% of the sample have a high school education, 11.3% have a higher education, and the remaining 8.5% of the sample have a post-high school education. Most of the sample, namely, 78.3% are retired, 16.0% of the sample is involved in household chores, 3.8% of the sample is working, and the remaining 1.9% of the sample is unemployed. Regarding the type of occupational status, 50.0% of the sample had an occupation in the past with moderate/light manual work, 29.2% of the sample reported heavy manual work, and the remaining 20.8% of the sample reported non-manual work. Also, 21.7% of the sample reported having a paid/unpaid helper, while 78.3% of the sample is negative. Moreover, 35.8% of the sample reported that they have at least a good financial situation, 37.7% of the sample reported a moderate financial situation, and the remaining 26.4% of the sample reported a poor or very poor economic situation. It was also observed that 41.5% of the sample stays in a semi-urban area, 39.65 of the sample lives in an urban area, and the remaining 18.9% of the sample lives in a rural area. Regarding the insurance coverage of the sample, 86.8% reported that they have public insurance coverage, 5.7% of the sample reported that they have private insurance coverage, and 7.55% of the sample reported that they have both private and public insurance coverage. The average length of time dealing with musculoskeletal health problems from the sample is 16.6 years with a standard deviation equal to 14.1 years. Also, the shortest time to deal with musculoskeletal problems is 1 year and the longest is 70 years.

| Gender | N | Percent (%) |
|---|---|---|
| Male | 32 | 30,2 |
| Female | 74 | 69,8 |
| Total | 106 | 100,0 |
| Level of education | N | Percent (%) |
| Primary education | 42 | 39,6 |
| Gymnasium | 25 | 23,6 |
| Lyceum | 18 | 17,0 |
| Post-secondary | 9 | 8,5 |
| Higher | 12 | 11,3 |
| Total | 106 | 100,0 |
| Professional status | N | Percent (%) |
| Pensioner | 83 | 78,3 |
| Worker | 4 | 3,8 |
| Housework | 17 | 16,0 |
| Unemployed | 2 | 1,9 |
| Total | 106 | 100,0 |
| Salaried/unpaid assistant | N | Percent (%) |
| Yes | 23 | 21,7 |
| No | 83 | 78,3 |
| Total | 106 | 100,0 |
| Insurance coverage | N | Percent (%) |
| Public | 92 | 86,8 |
| Private | 6 | 5,7 |
| Both | 8 | 7,5 |
| Total | 106 | 100,0 |

**Table 1:** Sociodemographic characteristics.

|  | Minimum value | Maximum value | M | SD |
|---|---|---|---|---|
| Age | 65,0 | 98,0 | 76,1 | 7,9 |
| Number of children | 0,0 | 4,0 | 1,8 | 1,0 |
| Number of family members in the same house | 0,0 | 6,0 | 1,3 | 1,2 |

**Table 2:** Age, number of children, and number of family members in the same house.

According to the table **(Table 2)**, the survey participants have a mean (M) age of 76.1 years with a standard deviation (SD) of 7.9 years. The oldest respondent is 98 years old, while the smallest is 65. Also, the average number of children per participant is 1.8 (SD = 1.0) with the smallest number of children being 0 and the largest being 4. Furthermore, the average number of family members residing in the same house is 1.3 with a standard deviation equal to 1.2. The smallest number of members is 0 and the largest is 6. Finally, it was found that 37 people out of 106 (34.9%) live alone. Also, 40.6% of the sample is married, another 40.6% are widowed, 10.4% are single, and the remaining 8.5% of the sample are divorced.

|  | N | % |
|---|---|---|
| Yes | 59 | 55,7 |
| No | 47 | 44,3 |
| Total | 106 | 100,0 |

**Table 3:** Taking medication to treat musculoskeletal health problems.

In the table **(Table 3)**, we observe that 55.7% of the sample reports that they take medication to treat musculoskeletal health problems while 44.3% of the sample is negative.

Further, for 55.7% of the sample that reports receiving drugs to treat musculoskeletal health problems, the mean duration of taking these drugs is 10.5 years with a standard deviation of 10.6. The shortest duration is 1 year and the longest is 60 years. Also, 51.9% of the sample characterizes their musculoskeletal health problems as at least quite serious, while 48.1% of the sample characterizes their musculoskeletal problems as not at all or somewhat serious.

|  | Minimum value | Maximum value | Mean | SD |
|---|---|---|---|---|
| Health beliefs (internal) | 15,0 | 36,0 | 24,3 | 4,8 |
| Health beliefs (chance) | 6,0 | 29,0 | 20,2 | 5,1 |
| Health beliefs (doctors) | 6,0 | 18,0 | 13,9 | 2,8 |
| Health beliefs (others) | 3,0 | 18,0 | 11,5 | 3,8 |

**Table 4:** Health beliefs (health control focus).

According to the table **(Table 4)**, the control focus of the sample is moderate level regarding internal (M = 24.3, SD = 4.8), luck (M = 20.2, SD = 5.1), doctors (M = 13.9, SD = 2.8), and the others (M = 11.5, SD = 3.8). Also, it is observed that the self-efficacy of the respondents in pain ranges at a moderate level (M = 32.0, SD = 13.5).

|  | Minimum value | Maximum value | M | SD |
|---|---|---|---|---|
| Support from significant others | 2,00 | 7,0 | 5,0 | 1,2 |
| Support from family | 1,00 | 7,0 | 5,1 | 1,2 |
| Support from friends | 1,00 | 7,0 | 3,6 | 1,5 |
| Total social support | 2,00 | 6,6 | 4,6 | ,9 |

**Table 5:** Perceived social support.

In the table **(Table 5)**, overall social support (M = 4.6, TA = 0.9), family support (M = 5.1, TA = 1.2), from significant others (M = 5.0, TA = 1.2), while the support from friends ranges at a moderate level (M = 3.6, TA = 1.5).

It was also examined whether the data followed the normal distribution with the use of Kolmogorov-Smirnov and Shapiro-Wilk statistical tests. From these controls, it follows with the exception of some variables that the data do not follow the normal distribution (p < .05).

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pain self-efficacy | 1 | ,370* | ,517** | ,204* | ,474** | ,435** | -,197* | ,264** | -,257** | -,373** | ,172 | ,353** | -,225* | -,766** | ,299** |
| Social support (important others) | ,370** | 1 | ,707** | ,227* | ,824** | ,176 | -,125 | ,237* | ,165 | ,066 | ,197* | ,202* | -,156 | -,191* | ,124 |
| Social support (family) | ,517** | ,707** | 1 | ,117 | ,770** | ,247* | -,185 | ,212* | ,060 | -,013 | ,236* | ,328** | -,107 | -,354** | ,342** |
| Social support(friends) | ,204* | ,227* | ,117 | 1 | ,658** | ,053 | -,048 | ,120 | -,046 | -,276** | -,068 | ,353** | -,185 | -,226* | -,094 |
| Total social support | ,474** | ,824** | ,770** | ,658** | 1 | ,203* | -,153 | ,248* | ,069 | -,121 | ,145 | ,402** | -,205* | -,344** | ,146 |
| Health locus of control(internal) | ,435** | ,176 | ,247* | ,053 | ,203* | 1 | -,395** | ,285** | ,060 | -,178 | ,196* | ,170 | ,021 | -,263** | ,183 |
| Health locus of control (chance) | -,197* | -,125 | -,185 | -,048 | -,153 | -,395** | 1 | -,278** | ,111 | ,215* | -,033 | -,203* | ,176 | ,115 | -,225* |
| Health locus of control(doctors) | ,264** | ,237* | ,212* | ,120 | ,248* | ,285** | -,278** | 1 | ,083 | -,125 | ,111 | ,038 | -,170 | -,167 | -,110 |
| Health locus of control(others) | -,257** | ,165 | ,060 | -,046 | ,069 | ,060 | ,111 | ,083 | 1 | ,446** | ,069 | -,167 | -,031 | ,264** | -,006 |
| Age | -,373** | ,066 | -,013 | -,276** | -,121 | -,178 | ,215* | -,125 | ,446** | 1 | ,110 | -,029 | -,200* | ,222* | ,214* |
| Number of family members in the same house | ,172 | ,197* | ,236* | -,068 | ,145 | ,196* | -,033 | ,111 | ,069 | ,110 | 1 | ,055 | -,066 | -,098 | ,260** |
| Economic situation | ,353** | ,202* | ,328** | ,353** | ,402** | ,170 | -,203* | ,038 | -,167 | -,029 | ,055 | 1 | -,088 | -,265** | ,237* |
| Duration treatment of musculoskeletal health problems | -,225* | -,156 | -,107 | -,185 | -,205* | ,021 | ,176 | -,170 | -,031 | -,200* | -,066 | -,088 | 1 | ,163 | ,001 |
| Severity of musculoskeletal health problems | -,766** | -,191* | -,354** | -,226* | -,344** | -,263** | ,115 | -,167 | ,264** | ,222* | -,098 | -,265** | ,163 | 1 | -,293** |
| Number of children | ,299** | ,124 | ,342** | -,094 | ,146 | ,183 | -,225* | -,110 | -,006 | ,214* | ,260** | ,237* | ,001 | -,293** | 1 |

**Table 6:** Correlations.

.

According to the table **(Table 6)**, it appears that there is a statistically significant positive correlation (correlations greater than 0.3 absolute value are commented, values below 0.3 absolute value are insignificant between pain self-efficacy with the support from the significant other (r = .370, p < .01), family support (r = .517, p < .01), overall social support (r = .435, p < .01), and financial status (r = .353, p < .01)).

In addition, a statistically significant negative correlation is observed between pain self-efficacy with age (r = -.373, p < .01) and the severity of musculoskeletal health problems (r = -.766, p < .01). Regarding support, a statistically significant positive correlation is observed between financial status and family support (r = .328, p < .01), support from friends (r = .353, p < .01), and overall social support (r = .402, p < .01).

| | Yes | | No | | Levene's test | | t-test | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | F | p | t | df | p |
| Pain self-efficacy | 26,68 | 10,83 | 38,72 | 13,69 | 4,196 | ,043 | -4,929 | 86,300 | ,000 |
| Social support (important others) | 4,93 | 1,22 | 5,14 | 1,17 | ,011 | ,916 | -,903 | 104 | ,369 |
| Social support (family) | 4,97 | 1,16 | 5,28 | 1,29 | ,002 | ,965 | -1,289 | 104 | ,200 |
| Social support (friends) | 3,50 | 1,50 | 3,69 | 1,52 | ,008 | ,928 | -,632 | 104 | ,529 |
| Total social support | 4,47 | ,98 | 4,70 | ,96 | ,023 | ,881 | -1,240 | 104 | ,218 |
| Health locus of control(internal) | 24,15 | 4,71 | 24,43 | 5,06 | ,002 | ,960 | -,287 | 104 | ,775 |
| Health locus of control(chance) | 19,86 | 4,75 | 20,66 | 5,43 | 1,569 | ,213 | -,804 | 104 | ,423 |
| Health locus of control(doctors) | 13,66 | 3,04 | 14,11 | 2,47 | 1,662 | ,200 | -,813 | 104 | ,418 |
| Health locus of control(others) | 12,08 | 3,41 | 10,79 | 4,08 | 3,098 | ,081 | 1,783 | 104 | ,077 |

**Table 7:** Differences between people taking medication and people not taking medication for musculoskeletal problems in self-efficacy in pain, perceived social support, and focus on health control.

In the table **(Table 7)**, it is observed that people who do not take drugs (M = 38.72) compared to people who take drugs for musculoskeletal health problems (M = 26.68) show a higher level of pain self-efficacy (p < .05).

## 4. Discussion

With the present research, an attempt was made to study some important factors associated with the elderly suffering from musculoskeletal diseases, which are among the most common disorders that someone can experience, especially during older age. Specifically, the sample includes people over 65 years old with the majority being women (74 people), while the average age is 76 years.

The fact that the great majority of the sample, almost 70%, were women is consistent with literature and research on the high prevalence of musculoskeletal diseases among females [27]. Of course, the increased percentage in the present research may also be due to other factors, such as socio-psychological related to the degree of acceptance of the problem, the desire to participate in related research by the male population, and the fact that the sample was of convenience. Despite these, it could be considered as an indication of health problems, specifically that women experience more often, musculoskeletal problems.

In this particular case, the sample was experiencing musculoskeletal pain from chronic or more recent disorders or injuries. From the fact that the middle length of time dealing with musculoskeletal problems was estimated at 16.6 years and the maximum reached 70 years, one realizes the chronicity of the disorders. An important question that is being studied in this research is whether there is a belief that the patient can respond despite the pain he faces. In fact, it appears that more than half of the elderly (55.7%) follow medication to deal with their musculoskeletal problems, with an average duration of 10.5 years and 51.9% characterizing their condition as at least enough important.

In addition, the social support received was investigated in elderly persons who deal with musculoskeletal problems. These people are distinguished by specific characteristics both in terms of physical and mental health, as well as in social and financial terms. It is observed that the percentage of individuals in the sample who have been widowed is quite high, at 40.6%, as well as of married people and those who live together. Also, many live alone (34.9%), while 26.4% declare a bad or very bad financial situation. So, it is considered important to study the factors that influence social support.

Furthermore, the topic of the study was the health beliefs and specifically the focus of control of the elderly regarding their health, i.e., the belief that these people have about the control of specific issues. Generally, it has been shown that with increasing age, the sense of control decreases. This may show that patients of advanced age are not capable of being effective in the context of controlling their disease due to their vulnerability. Nevertheless, the health beliefs of a person, especially of the elderly, in this particular case with musculoskeletal problems, is a multifactorial issue, while it seems to have a large effect on the course of illness and the ability to cope with pain [28].

Regarding the rest of the demographic characteristics, it should be noted that 78.3% do not have someone salaried and or an unpaid assistant, while the majority of them were retired. Of those who were working, 53% did moderate/light manual work and 31% heavy. Also, 41.5% lived in a semi-urban area, 39.6% in an urban area, and 18.9% in a rural area. Finally, 39.6% were elementary school graduates and only 19.8% had post-high school or higher education.

The results showed that there is a statistically significant positive correlation between pain self-efficacy and the support from the significant others, family support, and overall social support giving emphasis on the positive impact that social support has.

Finally, those patients, who do not take their medication, manage better their pain than those taking medication. This may be due to older adults adopting health behaviors that improve their pain self-efficacy, physical functioning, and mental state, as mentioned by DiRenzo et al. [29]. Subsequently, it was found that people who did not have a helper compared to people who had a helper showed a higher level of pain self-efficacy, which is also confirmed by research [30]. It seems that the lack of a helper contributes to the motivation of patients.

In general, the current study has shown strong correlations between the variables of social support, pain self-efficacy, and health beliefs in older adults with musculoskeletal disorders. Future studies can be conducted so as to indicate possible causal relations.

## 5. Conclusion

In conclusion, musculoskeletal conditions are expected during the procedure of aging and have a negative impact on the functionality of the elderly. Through research, the factors that hinder their physical and mental health, and others that contribute to it, are highlighted. Understanding these complex mechanisms can provide the impetus for the essential help of specific people, through interventions, decent government services or structures, or whether society as a whole but also each individual contributes to the promotion of well-being and quality of their lives.

The present research was carried out on a relatively small sample, i.e., 106 people due to limited time. Also, the sample was not randomized but feasible as it was carried out in beneficiaries of a certain geographical area. Consequently, future studies should be conducted using large samples.

## References

1. Williams BA, Chang A, Ahalt C, Chen H, Conant R, Landefeld CS, Yukawa M. (Eds.). Current Diagnosis & Treatment: Geriatrics, Second Edition. McGraw Hill. 2014.

2. Macìas-Núñez JF, CasadoJ-MR, del Rey MF, et al. Biology of the Aging Process and Its Clinical Consequences. In: MachasNúñez JF, Cameron JS, Oreopoulos DG. (eds) The Aging Kidney in Health and Disease. Springer, Boston, MA. 2018.

3. Beaudart C, Zaaria M, Pasleau F, et al. Health Outcomes of Sarcopenia: A Systematic Review and Meta-Analysis. PLoS One. 2017;12(1):e0169548.

4. Landi F, Liperoti R, Russo A, et al. Sarcopenia as a risk factor for falls in elderly individuals: results from the ilSIRENTE study. Clin Nutr. 2012;31(5):652-58.

5. Woo J, Leung J, Lau E. Prevalence and correlates of musculoskeletal pain in Chinese elderly and the impact on 4-year physical function and quality of life. Public Health. 2009;123(8):549-56.

6. Keefe FJ, Somers TJ. Psychological approaches to understanding and treating arthritis pain. Nat Rev Rheumatol. 2010;6(4):210-16.

7. Curtis E, Litwic A, Cooper C, et al. Determinants of Muscle and Bone Aging. J Cell Physiol. 2015;230(11):2618-625.

8. Hung M, Bounsanga J, Voss MW, et al. The relationship between family support; pain and depression in elderly with arthritis. Psychol Health Med. 2017;22(1):75-86.

9. Miaskowski C, Blyth F, Nicosia F, et al. A Biopsychosocial Model of Chronic Pain for Older Adults. Pain Med. 2020;21(9):1793-805.

10. Perissinotto CM, Stijacic Cenzer I, Covinsky KE. Loneliness in older persons: a predictor of functional decline and death. Arch Intern Med. 2012;172(14):1078-083.

11. Emerson K, Boggero I, Ostir G, et al. Pain as a Risk Factor for Loneliness Among Older Adults. J Aging Health. 2018;30(9):1450-461.

12. Smith TO, Dainty JR, Williamson E, et al. Association between musculoskeletal pain with social isolation and loneliness: analysis of the English Longitudinal Study of Ageing. Br J Pain. 2019;13(2):82-90.

13. Richmond NL, Meyer ML, Hollowell AG, et al. Social Support and Pain Outcomes After Trauma Exposure Among Older Adults: A

Multicenter Longitudinal Study. Clin J Pain. 2018;34(4):366-74.

14. Krokavcova M, van Dijk JP, Nagyova I, et al. Social support as a predictor of perceived health status in patients with multiple sclerosis. Patient Educ Couns. 2008;73(1):159-65.

15. Jaracz K, Pawlak M, Górna K, et al. Quality of life and social support in patients with multiple sclerosis. Neurol Neurochir Pol. 2010;44(4):358-65.

16. Solé E, Racine M, Tomé-Pires C, et al. Social Factors, Disability, and Depressive Symptoms in Adults With Chronic Pain. Clin J Pain. 2020;36(5):371-78.

17. Benka J, Nagyova I, Rosenberger J, et al. Social support and psychological distress in rheumatoid arthritis: a 4-year prospective study. Disabil Rehabil. 2012;34(9):754-61.

18. Pitsilka DA, Kafetsios K, Niakas D. Social support and quality of life in patients with rheumatoid arthritis in Greece. Clin Exp Rheumatol. 2015;33(1):27-33.

19. Rotter JB. Social Learning and Clinical Psychology. New York: Prentice-Hall; 1954.

20. Rotter JB. Generalized expectancies for internal versus reinforcement. Psychological Monographs: General and Applied. 1966;80(1):1-28.

21. Wallston KA. Control Beliefs: Health Perspectives. International Encyclopedia of the Social & Behavioral Sciences. 2nd Ed. 2015.

22. Wallston KA, Stein MJ, Smith CA. Form C of the MHLC scales: a condition-specific measure of locus of control. J Pers Assess. 1994;63(3):534-53.

23. Zimet GD, Dahlem NW, Zimet SG, et al. The multidimensional scale of perceived social support. J Pers Assess. 1988;52(1):30-41.

24. Theofilou P. Translation and Cultural Adaptation of the Multidimensional Scale of Perceived Social Support for Greece. Health Psychol Res. 2015;3(1):1061.

25. Nicholas M. Self-efficacy and chronic pain. Annual Conference of British Psychological Society. St Andrews. 1989.

26. Theofilou P, Aroni A, Tsironi M, et al. Reliability of the Greek version of "Pain Self-Efficacy Questionnaire" in patients with chronic kidney disease. Hellenic Journal of Nursing. 2014;53(2):175-184.

27. Fejer R, Ruhe A. What is the prevalence of musculoskeletal problems in the elderly population in developed countries? A systematic critical literature review. Chiropr Man Therap. 2012;20(1):31.

28. Eizenman DR, Nesselroade JR, Featherman DL, et al. Intraindividual variability in perceived control in an older sample: the MacArthur successful aging studies. Psychol Aging. 1997;12(3):489-502.

29. DiRenzo D, Finan P. Self-Efficacy and the Role of Non-Pharmacologic Treatment Strategies to Improve Pain and Affect in Arthritis. Curr Treatm Opt Rheumatol. 2019;5:168-78.

30. Warner LM, Ziegelmann JP, Schüz B, et al. Maintaining autonomy despite multimorbidity: self-efficacy and the two faces of social support. Eur J Ageing. 2011;8(1):3-12.

To access the full-text version of this article, please scan the QR code: