



The Impact of the 2021 Fire in the Municipality of Ancient Olympia in Greece on the Mental Health of Residents: The Occurrence of Post-Traumatic Stress and Depression in Beneficiaries of Social Services

Manolis Nikolaos Mentis, Eleni Mavroeidi, Konstantina Bousia, Konstantinos Mavroyiannis, Theodoros Tsokos, Georgia Konstantopoulou *

Department of Education and Social Work, School of Humanities and Social Sciences, University of Patras, Greece

*Corresponding author: gkonstantop@upatras.gr

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ABSTRACT

A natural disaster is the probability of a potentially catastrophic event occurring over a period of time in a specific geographical area. The aim of this research was to investigate whether the catastrophic fire of 2021 affected the mental health, in terms of post-traumatic stress and depression, of the social care services beneficiaries in the Municipality of Ancient Olympia in Greece. A questionnaire was used which, apart from demographic questions, contained two main tools: a) the PCL Scale (a tool for assessing post-traumatic stress), b) the Geriatric Depression Scale. The individuals with post-traumatic stress in the sample are in the range of moderate to high PTSD symptomatology. The majority of the participants are in the range of moderate PTSD symptomatology, but there is also a significant percentage who are in the range of high PTSD symptomatology. In terms of geriatric depression, the individuals in the sample are close to the mean. This article was written to serve as reference for the PTSD that can be directly caused by natural disasters.

Keywords: Fire, Mental health, PTSD

1 Introduction

Natural disasters are large-scale events that are often unexpected and cause death, trauma and property damage. Researchers agree that disasters share three types of characteristics: a) they threaten to harm or lead large numbers of people to death - regardless of the final outcome; b) they affect and/or disrupt social processes such as services and social networks; and c) they lead to mental and physical health strain. Globally, such disasters occur every day and, due to climate change, hundreds of millions of people are affected every year. In Portugal, forest fires are responsible for disasters that tend to recur annually, leading to dramatic consequences, such as those that occurred in 2017, with the destruction of hundreds of houses and the death of tens of people (Becker *et al.*, 2022; Leone *et al.*, 2023). 2007 was another black page in the history of our country. About 2,500,000 hectares were destroyed in Peloponnese and Evia and 77 dead were the toll of the unprecedented fire that broke out in 2007.

In 2015 Russia was hit by heat and drought with a part of the country devastated by deadly wildfires killing 33 people. Entire villages were wiped off the map while ten million acres of forest were destroyed. A traumatic event is defined as an event that is experienced by the individual as threatening, accompanied by feelings of fear or even terror, and in the face of which the individual feels helpless. It is an extremely broad concept as it refers to a variety of human experiences, both collective and public, whose impact varies a great deal since they affect the social group, i.e. a mass disaster. Trauma is defined as the impact of a traumatic event on the functional abilities and psyche of the person who experienced it. Also, mental trauma



is defined as a disorder that occurs as a reaction to the individual's exposure to a stressful event or situation of short or long duration. Mental trauma can be understood both as an abstract mental state and as a psychometrically measurable and defined disorder, while the onset of the disorder may vary from a few weeks to a few months after the trauma. The stressful event may be a situation of an extremely threatening or catastrophic nature likely to cause widespread distress to almost anyone, e.g. natural or man-made disasters, combat, serious accident, witnessing the violent death of others, submitting one's own in torture, terrorist attack, rape or other crime. However, any event that an individual experiences and perceives as extremely traumatic and threatening to himself can also be understood as traumatic. (Kakouros, & Maniadaki ,2006)

In particular, when a Natural Disaster occurs, the expected human reaction is the attempt to protect the life of the person experiencing the phenomenon, the lives of people close to this individual and the individual's assets. However, in many cases the reaction is not the expected one, as many people experience the event as simple observers (Sygollitou, 1997:260). Panic, which is defined as a disproportionate reaction of the crowd in relation to the real danger (Drury & Cocking, 2007:8) and an irrational behavior of the individual caused by fear (Heide, 2004:342), is also an expected behavior during a Natural Disaster (Sygollitou, 1997:260). In this case "instincts" overwhelm socialized responses, resulting in the collapse of collective bonds and social norms, as personal survival becomes the primary concern (Drury & Cocking, 2007:8). Some factors that may trigger the feeling of panic during a Natural Disaster are: a) the victim perceives the entrapment in a confined space as an immediate threat, b) escape routes appear to be blocked, c) flight appears to be the only way to escape and d) no one is available to help. However, since the combination of the above situations is rare in a Natural Disaster, panic is a rare reaction to such situations (Heide, 2004:342-343). However, due to the intensity and potential importance of Natural Disasters, many stereotypes have been developed regarding people's behavior towards these phenomena. The common stereotype of disasters essentially involves chaos, people panicking, losing interest in other people and acting irrationally. Also, there is often a perception that individuals act hostile and aggressive towards other people (Heide, 2004:341).

Hundreds of studies which also focus on fire-affected areas, attest that children, adolescents and adults can be diagnosed with PTSD after such natural disasters. Symptomatology related to post-traumatic stress is developed by some people after experiencing or witnessing life-threatening situations such as natural or man-made disasters, armed conflicts, traffic accidents, etc. Often individuals experience the occurrence of disturbing memories and difficulty in sleeping. They may feel fear, anger, guilt, anxiety and/or avoid being at the scene of the incident. When the symptoms continue for more than a month and affect the person's daily functioning, these people may have developed PTSD. This disorder has significant comorbidity with depression and alcohol and/or illicit substance abuse. In particular, PTSD includes four types of symptoms, which are associated with reliving the traumatic event: a) dreams or flashbacks; b) avoiding things/people/situations that remind one of the traumatic events; c) experiencing more negative thoughts or feelings than in the period before the traumatic event; and d) overstimulation - feeling constantly anxious. Clinical Depression is the most common post-disaster disorder, since it has an increased prevalence (incidence) regardless of the disaster event. Also, disaster victims may experience phobias, panic attacks, fear of death, depression and other mental disorders (Zayfert & Becker, 2006), while after disasters there is an increase in the use of alcohol, tobacco and drugs.

The fires that broke out in Greece in 2007 and 2018 were two of the greatest tragedies of the 21st century, leaving behind dead people, burnt land and huge consequences on the psyche of those who experienced the fiery havoc. The events 'marked' the prefecture of Elis and specifically the municipality of Ancient Olympia. The fire ravage which occurred in Ancient Olympia and the villages of the municipality in August 4, 2021 expanded with intensity and caused unimaginable destruction for almost five days. It is important to note that, the psychological wounds caused by natural disasters which affect the lives of people to a significant degree are scientifically measurable. The aim of this study is to investigate the impact of the catastrophic fire of 2021 on the occurrence of post-traumatic stress and depression on beneficiaries of

social care services, namely people over 65 years of age, in the municipality of Ancient Olympia, in the south of Elis. The research hypotheses are whether gender and loneliness (A8) influenced the following dependent variables: 1) levels of post-traumatic stress, 2) geriatric depression, 3) overall health status (B5), 4) physical health status (B6), 5) mental health status (B7), 6) satisfaction with current lifestyle (B8); and 7) whether the percentage (%) of property affected by the catastrophic fire (C3) was also a source of influence. Although fires are a natural phenomenon, a study carried out in Mediterranean countries for the period 2006-2010 showed that only 4.7% of the fires were caused by a natural phenomenon. The majority (55.8%) were caused by a deliberate act (arson), followed by negligence (33.5%) and accidents (6.1%) as the second and third most popular causes of fires. Hence, man is the main cause of forest fires. Indeed, in Mediterranean countries human responsibility for the breakout of fires exceeds 90%, while lightning is responsible for a much smaller proportion of fires. However, lightning fires can be particularly dangerous, as they are likely to occur in rugged locations where extinguishing conditions are particularly difficult (Landis *et al.*, 2018). The researchers Gritzani *et al.*, (2013) investigated psychopathology and aggression in fire-exposed individuals, specifically those affected by the 2007 fires in Ancient Olympia. Specifically, 174 adults participated in this research and were classified into two groups. Those who lived in Ancient Olympia and were affected by a fire (83 out of the 174 participants), and those 91 who lived in Nafplion and were not affected (91 individuals). The results of the research showed that the people who belonged to the group affected by the fires presented higher levels of post-traumatic stress as well as a tendency towards extroverted hostility. The affected group had no higher levels in psychopathology, with the exception of depression (Gritzani *et al.*, 2013).

In addition to human losses and the destruction of land and property, fire disasters also bear significant consequences for the mental health of the people who experienced such an incident. A typical example is the 2016 research conducted in Canada in the area of Fort McMurray, where 88,000 people left their homes and 2,400 homes were burnt. Six months after this disaster, in a related study conducted on a sample of 379 fire victims, it was found that 29.1% of the study objects were diagnosed with post-traumatic stress, 25.5% with depression and 43.6% with sleep disorders. There was also an increase in the use of substances by the study participants. This finding demonstrates the devastating consequences of fires on the daily lives of those who experience them and the fact that the consequences continue to manifest for a considerable period after the traumatic event affecting the daily functionality of the victims in a negative way. In addition to fire victims, another group at a high risk of developing PTSD are firefighters who are on the front lines of firefighting (Tara K. McGee, 2019). Fear during firefighting, insomnia, depressive symptoms and neuroticism are some of the reasons why firefighters become more vulnerable to post-traumatic stress. Research has shown that 20% of firefighters are expected to experience post-traumatic stress at some point in their lives, compared to 6.8% of the general population (McGee, T.K., 2018). Other consequences of the firefighters' continuous exposure to such traumatic experiences include depression, anxiety, substance abuse, excessive alcohol consumption, and even suicide. These conditions are much more common among firefighters than in the rest of the general population (Van Hasselt V *et al.*, 2023). Related research has also shown that 46.8% of firefighters experience suicidal tendencies and 15.5% attempt suicide during their career, while another recent study by the American Psychiatric Association found that a lot of firefighters are more likely to commit suicide than die in the course of their duties (Landis *et al.*, 2018).

A post-fire survey in Alberta, Canada showed that children aged between 5-12, specifically those in the younger age group, had a high rate of PTSD at the same level as those who had lost their homes in the fire. Concerning the impact of disasters on mental health, Tyhurst coined the term "The Disaster Syndrome" in 1950 to describe the state of the victims of a disaster as they wander around disoriented, frozen and confused. Hence, although the majority of people seem to cope well with the effects of a disaster, there is a significant proportion who will experience mental health difficulties and a smaller proportion who will develop mental disorders. People's resilience is related to how fast they can return to their pre-disaster lives, however this does not in any way mean that they come out of the psychological impact unscathed.

Also, a long period until the return to 'normality' constitutes an aggravating factor (Clark *et al.*, 2004). Research results show an increased rate of PTSD, depression, and generalized anxiety across several follow-up periods after the fire, from the subacute phase to years afterward. An increased rate of post-fire mental health disorders has been found in both adult and pediatric populations, with a number of associated risk factors, the most important being characteristics of the fire trauma itself (Patricia *et al.*, 2021).

2 Methodology

This survey was quantitative. The non-random sampling method with the purposive sampling technique were used, which involves the selection of subgroups from the survey population that met the criterion of particular interest and willingness to participate. The study population consisted of people affected by the fire of the summer of 2021 in Ancient Olympia. The individuals who participated in the study were informed about the purpose of the study and assured of the confidentiality and anonymity of the process. In total, 88 individuals qualified to participate in the study. The self-completed questionnaire was sent to the social structures of the Municipality of Ancient Olympia and specifically to the mental health professionals (psychologists and social workers) serving there. In turn, they administered it to the people affected by the fire in the summer of 2021 in Ancient Olympia who were interested (or persuaded) to participate. The above professionals undertook to provide the necessary clarifying explanations when needed. The questionnaire took approximately 25 minutes to complete.

2.1 Instruments

A questionnaire was administered which, in addition to the demographic questions, contained two main instruments: a) the PCL Scale (a tool for assessing post-traumatic stress), b) the Geriatric Depression Scale (GDS-15), which contains 15 questions with dichotomous answers (0, 1). The questionnaire given to the participants in the study included questions about their socio-demographic data (gender, age, ethnicity, marital status, number of children, level of education, health-related questions, opinions related to fire-related problems, etc.). The PTSD Checklist Civilian Version (PCL) scale (Weathers, Litz, Huska & Keane, 1993) is a tool for assessing post-traumatic stress. It was developed in 1993 by Weathers, Litz, Huska and Keane at the National Center for PTSD - Behavioral Science Division. It is a self-report questionnaire that includes 17 statement questions. The statement questions are answered on a five-point frequency scale (where 1=not at all, 2=a little, 3=sometimes, 4=a lot and 4=very much).

The questionnaire was used by the Centre for Research on Equality Issues (KETHI) in 2000 in a study on the psychosocial impact of the earthquake of 7 September 1999 on the population of Attica, Greece. The final score for each person is the sum of the individual scores on each of the 17 questions (range = 17-85). Obviously, the higher the final score for each person, the more severe the PTSD symptomatology they experience. According to the test developers, depending on the score of each person, they are placed in one of the following categories. 17-29. Minimal PTSD symptoms. 28-29. Moderate PTSD symptoms. 30-44. Moderate to moderately high PTSD symptomatology. 45-85. High PTSD symptomatology. Variables B5, B6, B7, B8 take values from 1 - 10 and the higher the value the more positive the attitude.

The Geriatric Depression Scale (GDS-15) developed by Sheikh and Yesavage in 1986 (Sheikh & Yesavage, 1986) contains 15 questions and the answers are dichotomous (0,1). The scale used in the present study was the adapted Greek version by Fountoulakis *et al.* (Fountoulakis *et al.*, 1999), and the final score is the sum of the individual responses and ranges from 0 to 15. The higher the score, the greater the person's geriatric depression.

2.2 Statistical analysis

SPSS 20 was used for statistical processing of the survey data and the sample reliability was calculated. Descriptive and inferential statistics were performed. Absolute frequencies and % percentages were used to describe the qualitative (categorical) variables; mean values and deviation values were used to

describe the quantitative variables. For the correlation of two quantitative variables, the non-parametric Spearman correlation coefficient ρ (rho) was used, which takes values from 0 to 1 in case the correlation is positive (as one variable increases, the other increases). If the correlation is negative (as one variable increases the other decreases), then the correlation coefficient takes values from -1 to 0. The individual limits of the correlation vary according to the author. The limits accepted by several authors will be listed herein.

3 Results

The internal reliability of the instrument was measured by Cronbach's alpha (Cronbach's α), which takes values from 0 to 1. The results are presented in Table 1

Table 1: Cronbach's alpha indices for the questionnaire scales

	Cronbach's α	Statements
TOTAL PCL	0,936	17
TOTAL DEPRESSION	0,621	15

According to George and Mallery (2003), values of Cronbach's internal reliability alpha (Cronbach's α) greater than or equal to 0.9 are considered excellent, values between 0.8 and 0.9 are considered good, values between 0.7 and 0.8 are considered acceptable, values between 0.6 and 0.7 are considered low - marginally acceptable, values between 0.5 and 0.6 are considered poor and values below 0.5 are considered unacceptable. So, the tool used shows wonderful reliability with respect to PCL SUM, while the reliability with respect to PCL SUM is low (George & Mallery, 2003).

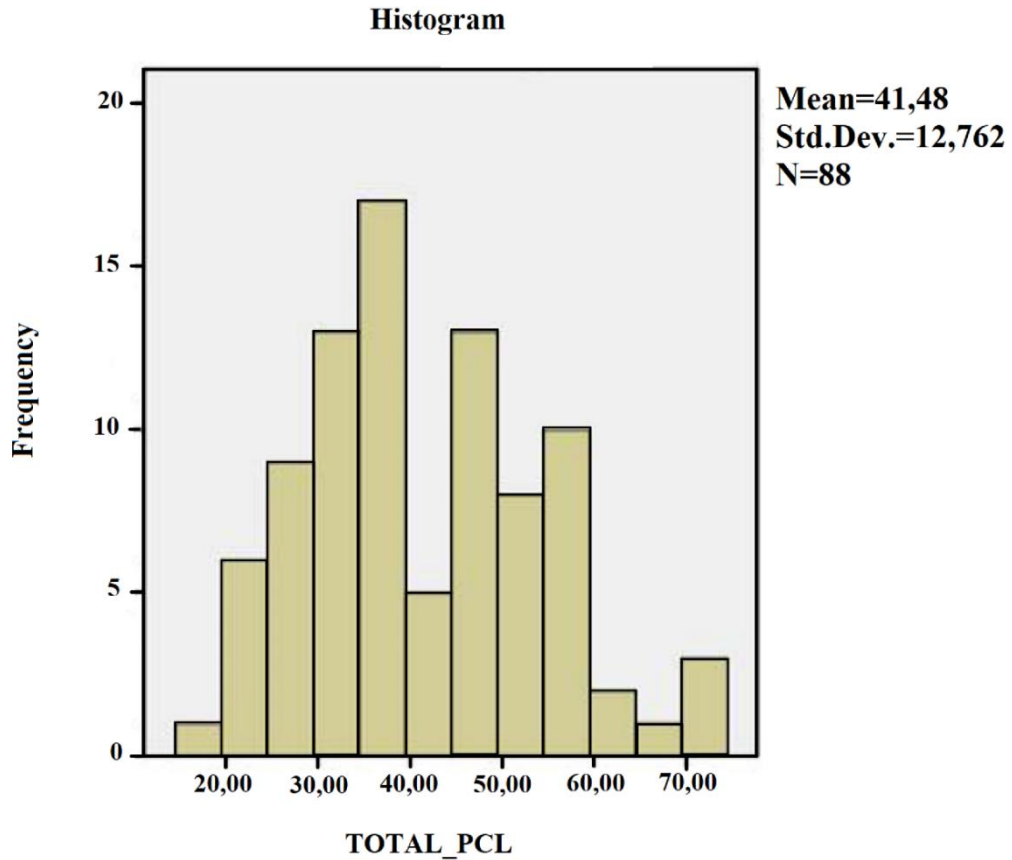
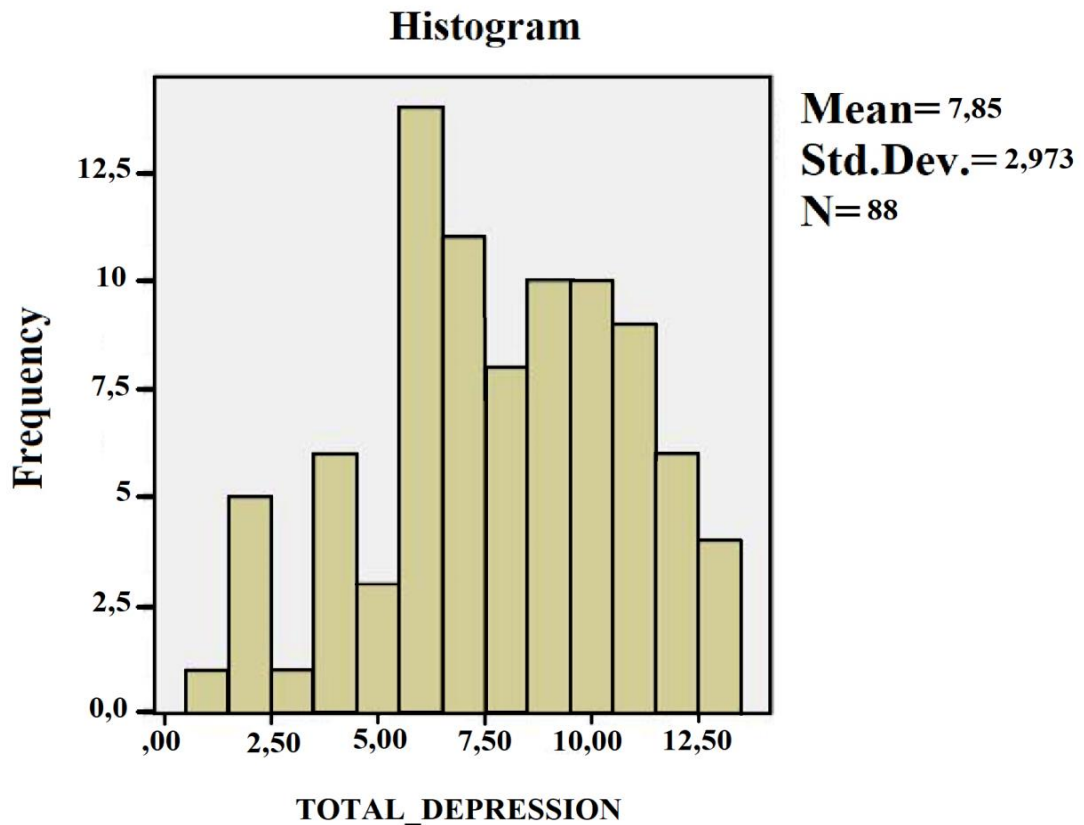
The average age of the sample is 75 years with 2 children, and they rate their overall health status, physical health status, mental health status and satisfaction with their current lifestyle slightly above average because the variables B5, B6, B7, B8 take values from 1 - 10 and the higher the value the more positive the attitude. Furthermore, they state that their property was affected by the catastrophic fire in less than 50% (38.84%). The majority of people in the sample are farmers, have pension income, live with one person or no one and are happy with their living conditions. Also, they have chronic health problems, heart problems, endocrinological problems, receive medication, and those who live in the fire-damaged District have suffered damage to their personal property.

Regarding post-traumatic stress the mean value is 41.77, when the range of moderate to high PTSD symptomatology is from 30 to 44. Finally, regarding geriatric depression, the values are close to the average value, with geriatric depression taking values from 0 to 15 -the higher the value the greater the geriatric depression-.

Table 2: Categorization of the individuals in the sample in relation to the levels of PTSD symptomatology

	N	N%
Minimal PTSD symptoms	14	15.9
Moderate PTSD symptomatology	39	44.3
High PTSD symptomatology	35	39.8
Total	88	100

From the above Table 2, which shows the categorization of the participants in relation to the levels of PTSD symptomatology, it is observed that the largest percentage of the individuals in the sample are in the range of moderate PTSD symptomatology. But there is also a significant percentage that is in range of high PTSD symptomatology. The non-normal distribution of the quantitative variables, i.e. the levels of post-traumatic stress, geriatric depression can also be seen visually from the graphs below. In the histograms, it can be seen visually that they do not meet the conditions of normality, because they show quite strong skewness or asymmetry (Skewness) positive (right) or negative (left). Figure 1,2

Figure 1: *TOTAL PCL*Figure 2: *TOTAL DEPRESSION*

The Mann-Whitney U test showed no statistical difference between men and women in terms of variables B5, B6, B7, B8, TOTAL PCL and TOTAL DEPRESSION, because all significance levels p (Asymp. Sig. (2-tailed)) are greater than the 0.05. A statistical difference between men and women ($p=0.032<0.05$) exists only in terms of the percentage of property damaged by the catastrophic fire (C3), where the percentage corresponding to men is significantly higher than that of women (Mean rank of men = 50.03, Mean rank of women = 38.44).

4 Discussion

The results of the study indicate a strong link between the traumatic event of the natural disaster, i.e. the catastrophic fire of 2021 and the occurrence of post-traumatic stress (PTSD). As expected, the vast majority of the participants who were over 65 living in the municipality of Ancient Olympia as beneficiaries of social care services, developed a post-traumatic stress (PTSD) disorder, regardless of their sex, as a result of their experience in the fire ravage and its consequences. Although the biggest percentage of the study participants were in the range of moderate PTSD symptomatology, another significant percentage of them was in the range of high PTSD symptomatology. Following the previous research of Gritzani *et al.*, (2013) regarding the impact of the 2007 fires in the area of Ancient Olympia, which showed that the people who belonged to the group affected by the fires, presented higher levels of post-traumatic stress (Gritzani *et al.*, 2013), the present study of 14 years later arrives at the same conclusions. Also, the present study links the traumatic experience of the catastrophic fire to a negative impact on the overall health status, physical health status, mental health status and pleasure levels the participants receive from their current lifestyle. With the physical problems of the participants being principally cardiac, endocrinological and musculoskeletal, the large majority also experienced mental problems, while the pleasure they receive from their current lifestyle was reduced as a direct consequence of the fire ravage. Also, the damage of their personal property due to the fire took an additional toll on their emotional state.

On the other hand, the results of the study showed that the participants had medium levels of geriatric depression. Namely, there is a weak link between geriatric depression and the participants' overall state of health, physical state of health, and their pleasure from the current lifestyle. Finally, in contrast to the previous research of Gritzani *et al.*, (2013), regarding the impact of the 2007 fires in the area of Ancient Olympia, which showed that women who experienced the traumatic event of the fire had higher stress levels compared to men as a predictive factor of PTSD and depression (Gritzani *et al.*, 2013), the present study showed that gender did not affect the levels or occurrence of post-traumatic stress and geriatric depression. Also, the gender factor played no role in the overall health status, physical health status, mental health status and enjoyment of the current lifestyle, with the exception of the percentage of property affected by the catastrophic fire, where men were affected more than women.

According to studies those with a history of depression before the fire were nearly five times more likely to report PTSD after the fire. Many studies have been conducted on the effect of previous mental health problems on PTSD. (Wanying *et al.*, 2022). A critical risk factor for developing depression and PTSD may be family history. Depressed individuals are more prone to trauma experiences than non-depressed individuals, which, in turn, increases the likelihood of developing PTSD (Wanying *et al.*, 2022).

5 Conclusion

Post-traumatic stress has excellent reliability, whereas reliability for depression is poor. The problems are mainly cardiac, endocrinological, musculoskeletal and mental. Also, the vast majority of people in the sample have suffered damage to their personal property from the devastating fire and their emotional state has worsened. The biggest problems faced by the participants in the study now are financial problems, health problems and stress - distress. Regarding post-traumatic stress, the subjects in the sample are in the range of moderate to high PTSD symptomatology, meaning that the largest percentage of the subjects in the sample are in the range of moderate PTSD symptomatology, but there is also a significant percentage in the range of high PTSD symptomatology. Regarding geriatric depression, the sample subjects

are close to the average value. The research hypothesis, that the gender of the research participants affected post-traumatic stress, geriatric depression, overall health status, physical health status, mental health status and enjoyment of the current lifestyle, was not verified. The only significant gender difference exists in the percentage of property affected by the catastrophic fire, where the proportion corresponding to men is significantly higher than that corresponding to women. The highest correlations (statistically significant, positive and above 0.7) were noted between overall health status (B5), physical health status (B6), mental health status (B7) and pleasure from the current lifestyle (B8). On the contrary, a statistically significant negative low correlation was noted between geriatric depression and the overall state of health (B5), the physical state of health (B6), and the pleasure from the current lifestyle (B8). Finally, a moderate negative was shown between geriatric depression and mental state of health (B7).

6 Declarations

6.1 Study Limitations

Because of the small and non-representative sample, some results which were produced that would probably have been different if the sample had been representative and considerably larger. These results were the low reliability of geriatric depression (0.621) and the existence of non-statistically significant differences due to gender in the variables post-traumatic stress, geriatric depression, overall health status (B5), physical health status (B6), mental health status (B7) and satisfaction with current lifestyle (B8). Also, the existence of non-statistically significant differences attributable to loneliness occurred in the variables post-traumatic stress, geriatric depression and the relation to the percentage (%) of property affected by the catastrophic fire (C3).

6.2 Competing Interests

There is no conflict of interest.

6.3 Publisher's Note

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References

- Becker, J. P., Paixão, R., and Quartilho, M. J. (2022). Dynamic psychotherapy as a PTSD treatment for firefighters: a case study. *Healthcare* 10, 3–10. doi: 10.3390/healthcare10030530
- Clark, D.M., & Ehlers, A. (2004). Post traumatic stress disorders from cognitive theory to therapy. In R.L. Leahy (Ed.), *Contemporary cognitive therapy: Theory, research, and practice* (pp.141-160). New York: Guilford.
- Drury, J. & Cocking, C. (2007). *The mass psychology of disasters and emergency evacuations: A research report and implications for practice*. Department of Psychology, University of Sussex, Falmer, Brighton.
- Fountoulakis, K.N., Tsolaki, M., Iacovides, A. *et al.* The validation of the short form of the Geriatric Depression Scale (GDS) in Greece. *Aging Clin Exp Res* 11, 367–372 (1999). <https://doi.org/10.1007/BF03339814>
- George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference 11.0 update (4th ed.)*. Boston: Allyn & Bacon
- Gritzani, I., Tsironi, M., Giavella, F., Gouva, M., Kolovos, P., Gerveki, E. & Ziga, S. (2013). A study of the post-traumatic stress in the population of Ancient Olympia after the fires of 2007. *Interdisciplinary Health Care*, 5(3): 109 – 119.
- Heide, E. (2004). Common Misconceptions about Disasters: Panic, the “Disaster Syndrome”, and Looting, In O' Leary, M. (2004), *The First 72 Hours: A Community Approach to Disaster Preparedness*, Universe Publishing, Lincoln (Nebraska), 340 – 380.
- Kakouros, E & Maniadaki, K. (2006). *Psychopathology of children and adolescents. Developmental approach*. Athens: Tipothito.
- Landis, M.S.; Edgerton, E.S.; White, E.M.; Wentworth, G.R.; Sullivan, A.P.; Dillner, A.M. The impact of the 2016 Fort McMurray Horse River Wildfire on ambient air pollution levels in the Athabasca Oil Sands Region, Alberta, Canada. *Sci. Total Environ.* 2018, 618, 1665–1676.
- Leone, V., Elia, M., Lovreglio, R., Correia, F., and Tedim, F. (2023). The 2017 extreme wildfires events in Portugal through the perceptions of volunteer and professional firefighters. *Fire* 6, 133. doi: 10.3390/fire6040133

- McGee, T.K. Residents' Experiences of the 2016 Fort McMurray Wildfire. Presented at Advances in Forest Fire Research 2018, Coimbra, Portugal, 9–16 November 2018
- Patricia To , Ejemai Eboreime , Vincent I O Agyapong (2021). *The Impact of Wildfires on Mental Health: A Scoping Review*. Behav Sci (Basel) 2021 Sep 21;11(9):126. doi: 10.3390/bs11090126.
- Sheikh J.I., Yesavage J.A. (1986). Geriatric depression scale (GDS): Recent evidence and development of a shorter version. *Clin. Gerontol.* 5: 165–173.
- Syggolliou, E. (1997). *Environmental Psychology*. Athens: Hellenic Letters.
- Tara K. McGee, 2019, Preparedness and Experiences of Evacuees from the 2016 Fort McMurray Horse River Wildfire, *Fire* 2019, 2(1), 13; <https://doi.org/10.3390/fire2010013>
- Van Hasselt V. B., Bourke M. L., Schuhmann B. B. (2022). Firefighter stress and mental health: Introduction to the special issue. *Behav. Modif.* 46, 259–266. 10.1177/01454455211064955
- Wanying Mao, et al (2022). *Post-Traumatic Stress Disorder, Major Depressive Disorder, and Wildfires: A Fifth-Year Postdisaster Evaluation among Residents of Fort McMurray*. *Int J Environ Res Public Health*. 2022 Aug; 19(15): 9759. doi: 10.3390/ijerph19159759
- Weathers, F. W., Litz, B., Herman, D., Juska, J., & Keane, T. (1993). *PTSD Checklist—Civilian Version (PCL-C)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t02622-000>
- Zayfert, C.& Becker, C.B. (2006). *Cognitive Behavioral Therapy for PTSD.A case formulation*. New York: A Division of Guilford Publications, Inc

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