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Testing the Efficacy of a New Intervention Against Stress and Psychosomatic Symptoms

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ABSTRACT

The present study is conducted with a view to providing the first evidence in support of a new cognitive behavioral intervention that was designed to decrease several stress-related mental and somatic symptoms of health professionals during the COVID-19 pandemic in Greece, as well as to increase resilience and self-efficacy. The study is a randomized-control trial, and Factorial (2*3) Mixed ANOVAs were employed to present the effect of the intervention on 6 variables (psychosomatics, stress, anxiety, depression, resilience and self-efficacy) over time (as baseline [T1], post-intervention [T2] and 3-month follow-up [T3]). The intervention was delivered by two different instructors. 48 Greek health professionals (M_{age}= 36.1, SD= 12.66) were randomly allocated in two groups, as one group received the intervention ($N_{experimental}$= 25), while the other nothing ($N_{non-experimental}$= 20) with no great loses for both groups. All variables were measured through self-reported tools including PSSQ-29 (psychosomatics), the Greek versions of DASS-21 (stress, anxiety and depression), NMRQ (resilience) and GSE (self-efficacy). The results show that the intervention group showed significant differences in all DVs between T1 and T2 as well as between T1 and T2, while there were no differences between T2 and T3. The results of the present study are limited, but still promising for the efficiency and efficacy of the new intervention. The study took place through the spread of COVID-19 in Greece and thus new studies may test the intervention on other conditions.

Keywords: Psychosomatic symptoms; Stress management; COVID-19; randomized-control trial; RCT

INTRODUCTION

The present study is conducted to provide the initial evidence on the efficacy of a new behavioral intervention against the development of stress and psychosomatic symptoms, as well as its efficacy in favor of developing self-efficacy and resilience on a sample of health professional during the spread of Corona-Virus-2019 (COVID-19) in Greece.

What is more, the background design of the behavioral intervention is based on the outcomes of two previous research protocols that measured the levels of psychological wellbeing and the biopsychological impact of the spread of the COVID-19 in the everyday life of the Greeks during the first (Pilafas et al., 2021a; Strongylaki et al., 2021) and second (Pilafas & Lyrakos, 2021) spread in the country. Furthermore, the article focuses on the issue of psychosomatics, resilience, self-efficacy

and stress based solely on the results of the later research protocols.

Regarding the intervention, the background literature suggests that there is an interplay between stress and psychosomatic symptoms, while protective factors may include self-efficacy and resilience. To support, in the basic theory of psychosomatics, stress is supported to be the main factor in triggering any psychosomatic symptom (Dijkstra-Kersten et al., 2015; Teixeira et al., 2022). More specifically, the stress response to a negative stimulus in an acute or chronic adaptation of the stress response combined with any emotional appraisal -as this is described by the works of Richard Lazarus (Lazarus & Folkman, 1984)-, may result in symptoms with affect, somatic and cognitive background (Fink et al., 2007; Oubaid, 2023; Schulz et al., 2021).

In such an event, it is common for patients who experience psychological distress that exhibits a comorbidity with somatic symptoms to receive cognitive-behavioral interventions with promising results (e.g. Kampling et al., 2022; Rafanelli et al., 2020; Yang et al., 2022). The background theory of Cognitive Behavioral Therapy (CBT) shows feelings, thoughts and behaviors to interplay in vicious cycles, while the role of core beliefs plays a role of person's central ideas (Beck & Beck, 2020). In the case of psychosomatic disorders individuals are expected to work on their ideas regarding health issues as feeling and thinking incompetent on their situation (Sitnikova et al., 2019). Under this idea, the theories of self-efficacy and resilience may be relevant. First, self-efficacy refers to the belief of a person on their own competence (Bandura, 1977, 1982). Self-efficacy was also found to be beneficial to psychosomatic disorders (Frick et al., 2016; Petersen et al., 2023, 2024; Weidner et al., 2020), while resilience is shown to be against the development of psychosomatic symptoms (Pilafas & Lyrakos, 2021; Widjaja et al., 2020; Xu et al., 2024).

To proceed to the design of the current intervention, the background of the method relies between elements of cognitive behavioral therapy (Beck & Beck, 2020), the biopsychosocial model of illnesses (Engel, 1977, 1981) and self-reflection (Goupil & Kouider, 2019; Grant, 2001; Lyons & Zelazo, 2011). Any behavior was interpreted as a product of personality and the theory of nature-nurture at the first level of interpretation, while emotions, memories and self-reflective thoughts on the problematic situation/condition of the individual were thought to have an interplay as a second level beneath the epiphany of human behavior. Core beliefs, as described in CBT practice (Beck & Beck, 2020), were the central problem of any maladaptive thought and vicious cycle. It was initially reflected that since the intervention had retrieved some core elements from CBT, it had to be considered as an alternative -or COVID-19 specifically designed- cognitive behavioral based intervention, and thus delivered by CBT practitioners.

As a result, the aim of the present study is to illustrate for the first time to the scientific community the results of the intervention in question. The research question is drawn upon the efficacy of the intervention into a small group of receivers and non-receivers. It was initially hypothesized that the intervention of this study would present some effect against the level of self-reported levels of stress, anxiety, depression and psychosomatics, while it was also hypothesized that the same intervention would show some effect in favor of the level of self-reported self-efficacy and resilience. As the research questions and the hypotheses were developed, it was highly anticipated that the intervention would indeed show the anticipated results on health professionals. Those results were expected to contribute to the early stage of developing the new intervention, as well as to provide the first real-life feedback to the researchers.

MATERIALS & METHODS

Participants

The population of this study consists of 48 health professionals. All participants were Greeks, were able to read and understand in Greek, as well as to receive the intervention in Greek. The inclusion-exclusion criteria also included a non-neuropsychiatric background as well as no use of medical drugs and/or illegal substances at least 6 months prior the intervention were to start. The sample was split into two groups. The first was the experimental group which received the intervention, while the second one was the non-experimental which received nothing. The average age is found at 36.1 (SD= 12.66) with a range between 22 and 61. Further demographic details of the participants are given in Table 1.

Table 1. Summary of socio-demographic details of the participants of the study.

Main Variable	Variable's Subcategories	Total (%) N[a] = 48	Males (%) n = 11, (22.9%)	Females (%) n = 37, (77.1%)	Missing Answers (%)
Education[b]					-
	School Level, (%)	11, (22.9%)	3, (27.3%)	8, (21.6%)	
	Bachelor's Degree, (%)	26, (54.2%)	7, (63.6%)	19, (51.4%)	
	Master's Degree, (%)	11, (22.9%)	1, (9.1%)	10, (27%)	
Marital Status					-
	Single, (%)	17, (35.4%)	6, (54.5%)	11, (29.7%)	
	In relationship, <5 years, (%)	10, (20.8%)	3, (27.3%)	7, (18.9%)	
	In relationship, >5 years, (%)	2, (4.2%)	1, (9.1%)	1, (2.7%)	
	Married, (%)	12, (25%)	1, (9.1%)	11, (29.7%)	
	Divorced, (%)	6, (12.5%)	-	6, (16.2%)	
	Widowed, (%)	1, (2.1%)	-	1, (2.7%)	
Children					-
	None, (%)	30, (62.5%)	9, (81.8%)	21, (56.8%)	
	1, (%)	7, (14.6%)	2 (18.2%)	5, (13.5%)	
	2, (%)	9, (18.8%)	-	9, (24.3%)	
	3, (%)	2, (4.2%)	-	2, (5.4%)	
Occupation					-
	Registered Health Professional, (%)	37 (77.1%)	8, (72.7%)	29, (78.4%)	
	Trainee Health Professional, (%)	11 (22.9%)	3, (27.3%)	8, (21.6%)	
Income[c]					-
	≤ 10,000 €, (%)	19, (39.6%)	6, (54.5%)	13, (35.1%)	
	10,001 – 20,000 €, (%)	17, (35.4%)	3, (27.3%)	14, (37.8%)	
	20,001 – 30,000 €, (%)	4, (8.3%)	-	4, (10.8%)	
	≥ 30,001 €, (%)	8, (16.7%)	2, (18.2%)	6, (16.2%)	-
Residence					-
	Athens, (%)	48, (100%)	48, (100%)	48, (100%)	

Notes:
[a] N= total amount of participants
[b] Participants were asked to declare the level of the education, as this had already been achieved
[c] Participants were asked to declare the level of their income, based on the total annual household income and not based on their individual earnings and contribution to the household expenditures.

Design

The present study follows the design of a randomized-control trial ([RCT]; see Zabor et al., 2020). Therefore, a group of health professionals received the intervention and another one received nothing. The aim was to present the effectiveness of the new intervention in four different variables. Those variables are as follows, (i) psychosomatic health, (ii) depression-anxiety-stress, (iii) resilience and (iv) self-efficacy. The measurements of the variables

took place at baseline (T1), after the intervention (T2) and at a three-month follow-up (T3).

Analysis

The statistical analysis was performed through the SPSS software (IBM Corp., 2024). Any statistically significant differences in the means of any variable in this study between the experimental and the non-experimental groups were tested by employing Factorial (2*3) mixed ANOVAs for each variable in question (Field, 2017).

Measures

Psychosomatic Symptoms

Psychosomatic symptoms were measured through the 'Psycho-Somatic Screening Scale -29' ([PSSQ-29]; Pilafas et al., 2021b). The scale is self-reported and consists of 29 items. The scoring pattern is in Likert scale fashion and range between 0 to 10. The questionnaire is reported to be reliable in the Greek population with a Cronbach's alpha of .955 in two recent studies with one factor (Pilafas et al., 2021b; Pilafas & Lyrakos, 2021).

Stress, Anxiety and Depression

The levels of stress, anxiety and depression were measured through the use of the Greek version of the DASS-21 self-reported scale (Lyrakos et al., 2011). The scale consists of 21 items that measure accordingly stress, anxiety and depression in a Likert scale. The subscales correspond to the three conditions that measure respectively, i.e. stress, anxiety and depression. The tool is reported valid and reliable with a Cronbach's alpha between .90 and .97 in a sample of 537 Greeks (Lyrakos et al., 2011).

Psychological Resilience

The levels of psychological resilience were measured by using the Greek version of the 'Nicholson-McBride Resilience Questionnaire' ([NMRQ]; Pilafas et al., 2020). The questionnaire is self-reported, and measures resilience in 12 individual items with a Likert scale of 1 to 5. The questionnaire is reported reliable in the Greek population as in recent study it was found to have a Cronbach's alpha score of .800 with one factor (Pilafas et al., 2020).

Self-Efficacy

Self-efficacy was measured with the use of the Greek version of the General Self-Effiacy (GSE) scale (Glynou et al., 1994). The scale consists of 10 items that measure self-efficacy in a Likert scale of 1 to 4. The tool has presented a Cronbach's alpha score of .78 in the original study that introduced the scale in the Greek language (Schwarzer, 2024), while in a recent study the scale is shown to have a Cronbach's alpha score of .909 (Pilafas et al., 2024)

PROCEDURE

The present study took place between September 2020 and May 2021 in which timeframe there was the spread of COVID-19 in Greece.

After the study received ethical approval, a call in participation was sent through social media. Any correspondents were called to an online interview to be informed of the study and the background of the intervention, as well as for screening based on the inclusion-exclusion criteria.

88 individuals responded to the call on social media and were invited to the interview. 72 of the invited come to the appointment, while the rest 16 clearly did not meet the criteria of inclusion to the study.

The interviews were held by a single member of the research team with years of experience in screening interviews. One of the invited prospective participants declined participation since they did not want to participate in the first study to explore the new intervention. The rest 8 out of the 71 were on psychiatric drugs and thus were asked to be excluded. The rest of the 63 interviewees met the criteria of participation, though the last three of them were rejected since groups of 30 participants were already formed.

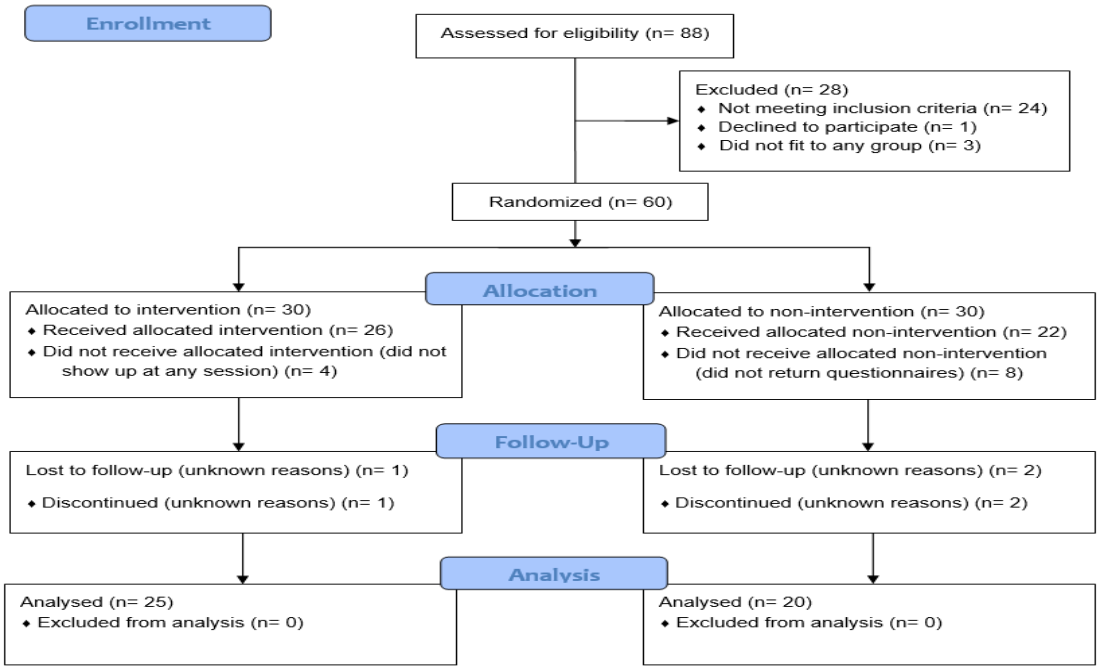
The 60 reaming candidates were allocated to the two groups, as the one group received the intervention and the second one received nothing. They were allocated in sequence allocation with the first participant to be allocated to the experimental group.

Measurements took place (T1), while the intervention group was allocated to two instructors who had a range of professional experience of 8 and 14 years of practice. The practitioners served as instructors to deliver the intervention. Therefore, they had received in advance a three-hour online training individually on the background of the design and mindset of the intervention method by a member of the research team. In this session the instructors were also communicated the results of five studies that reflect relevant results regarding the COVID-19 in Greece. The first study presented the coping strategies during COVID-19 (Stronglylaki et al., 2021). The second one shows the results on the main sources of anxiety and fear for COVID-19 (Lyrakos et al., 2022). The third one discusses the socio-demographic variables to psychosomatic symptoms (Pilafas et al., 2021c). The fourth one presents the increased levels of acute stress experienced by people who lived with a person of high risk for COVID-19 (Lyrakos et al., 2021), and the fifth study illustrates the interplay between stress and psychosomatics (Pilafas et al., 2021a). The 30 participants who were to receive the intervention were again allocated based on sequence allocation to the instructors. The sessions were to take place exclusively online, thus each instructed was given 15 participants. Any intervention was delivered by the instructors between the same timeframes. All participants received 8 sessions of 45 minutes once every week.

After the sessions were completed, the remaining to the study participants were given the opportunity to fill out for the second time (T2) the questionnaire electronically as they were contacted via emails. Next to the second measurement, a third one (T3) took place as a follow-up 3 months after the intervention the end of the delivery of the intervention to the participants.

The flowchart in Figure 1 shows the procedure with loses in participation at each stage of the study.

Figure 1. Flowchart of the study.



Note.

Flowchart was retrieved from CONSORT, as https://cdn-links.lww.com/permalink/phm/a/phm_00_00_2018_03_14_wu_ajpmr-d-17-00294_sdc1.pdf

RESULT

Regarding the results of the statistical analysis in this study, a summary of mean scores with standard deviations at T1, T2, and T3 are provided in Table 2.

Table 2. Mean scores and standard deviations of each group

	T1 (N= 48)		**T2 (N= 46)**		**T3 (N= 45)**	
	Experimental Group, n= 26	**Non-experimental Group, n= 22**	**Experimental Group, n= 26**	**Non-experimental Group, n= 20**	**Experimental Group, n= 25**	**Non-experimental Group, n= 20**
	M (SD)	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**
PSSQ-29	128 (78.09)	137.31 (51.67)	59.38 (43.53)	135.95 (48.79)	62.96 (41.99)	141.45 (57.49)
DASS-21, stress	22.38 (13.93)	19.54 (7.99)	12.07 (9.16)	23.4 (9.49)	11.2 (9.12)	22.1 (9.18)
DASS-21, anxiety	16.53 (12.21)	16.09 (8.38)	6.38 (5.98)	16.1 (8.86)	5.52 (6.03)	18.2 (7.91)
DASS-21, depression	19.15 (13.84)	17.45 (11.95)	7.92 (8.1)	19.9 (9.36)	8.24 (8.81)	19 (10.63)
NMRQ	35.92 (8.17)	36.18 (6.06)	42.07 (5.92)	35.3 (6.91)	42.84 (6.36)	36.6 (9.33)
GSE	24.96 (6.69)	26.63 (6.03)	30.19 (4.72)	26.5 (7.86)	31.36 (5.49)	27.05 (8.19)

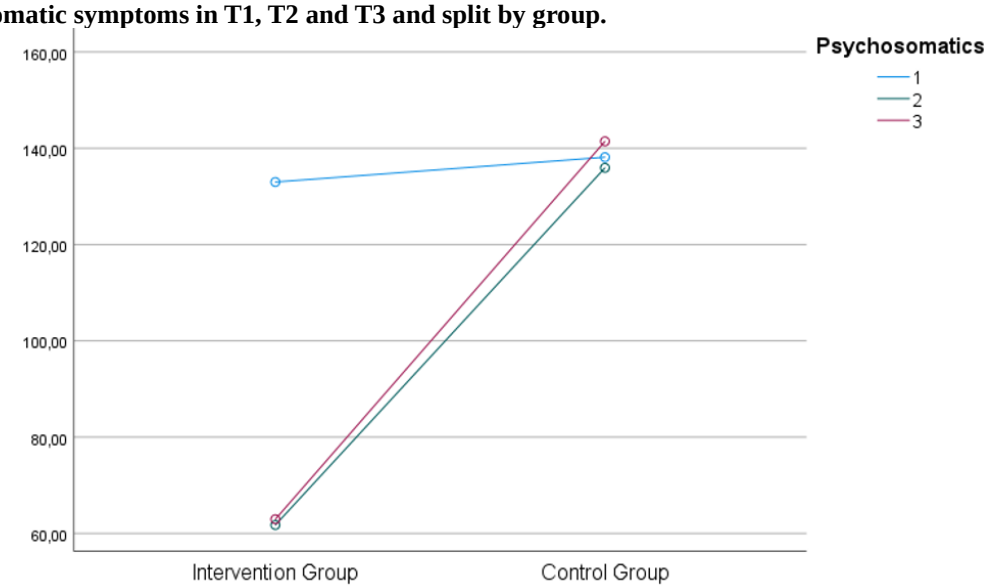
Notes.
N= Number of participants in total
n= Number of participants allocated to the specific group
M= Mean Score
SD= Standard Deviation
T1= before intervention (baseline)
T2= after the intervention
T3= 3-months follow-up
PSSQ-29= scale to measure psychosomatic symptoms
DASS-21= scale to measure stress, anxiety and depression
NMRQ= scale to measure psychological resilience
GSE= scale to measure general self-efficacy

Further statistical analysis on the efficacy of the new intervention was performed through 6 mixed measures ANOVAs to test the efficacy of the intervention between the three timeframes (T1, T2 and T3) for the group and between the group, along with the interaction between the groups and the timeframes per DV. This analysis was conducted individually between 6 variables (PSSQ-29, DASS-21 stress subscale, DASS-21 anxiety subscale, DASS-21 depression subscale, NMRQ and GSE) and time. Details of the analyses are provided below.

Psychosomatics (PSSQ-29)

Regarding psychosomatics, Pillai's trace shows that there is a significant effect of the new intervention on psychosomatics, as $V = .475$, $F(2, 42) = 18.98$, $p < .001$, and psychosomatics*group, as $V = .471$, $F(2, 42) = 18.69$, $p < .001$. Parametric assumptions were met in the analysis. The within-participants analysis presents a significant effect, as $F(2, 86)= 30.57$, $p< .001$, Partial $\eta^2= .415$. The between-subjects analysis shows that there is a statistically significant effect of the intervention on psychosomatics, as $F(1, 43)= 11.87$, $p< .001$, Partial $\eta^2= .216$. The Bonferroni Post-hoc test shows that the there is a statistical difference between T1 and T2 ($p< .001$, 95% CI [22.03, 51.41]) and between T1 and T3 ($p< .001$, 95% CI [18.31, 48.43]). Post-hoc Bonferroni shows no statistical differences between T2 and T3 ($p< .859$, 95% CI [-11.09, 4.38]). Graph 1 illustrates the differences observed between the two groups.

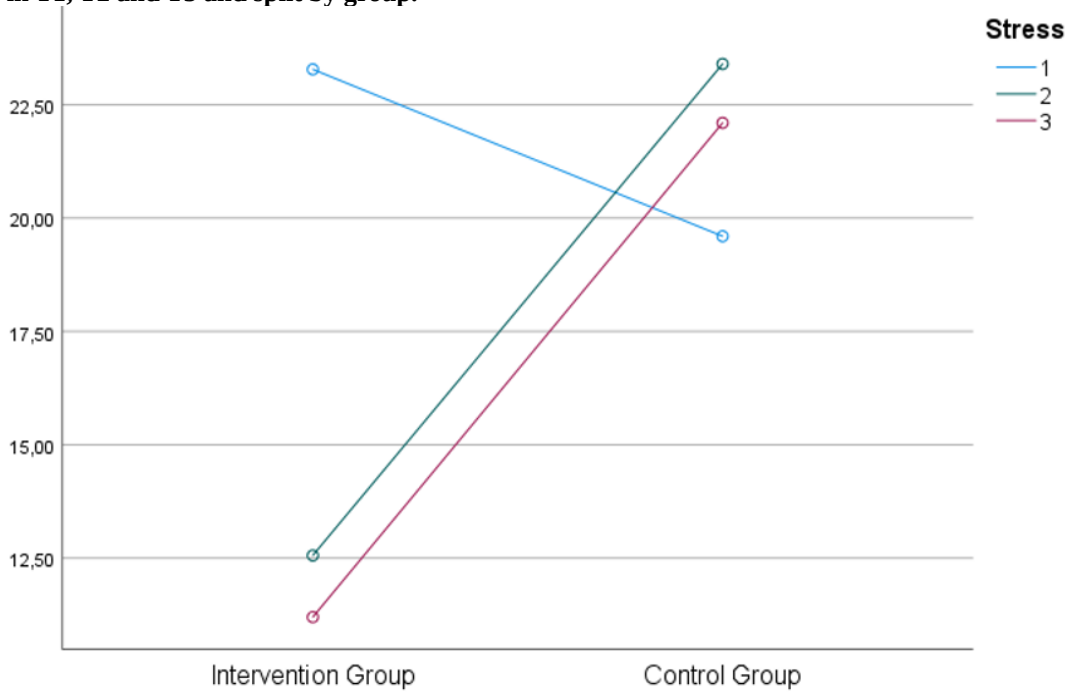
Graph 1. Illustration of the efficacy of the new intervention based on the differences in mean scores of psychosomatic symptoms in T1, T2 and T3 and split by group.



DASS-21, stress subscale (Stress)

With regard to stress, Pillai's trace presents a significant effect of the intervention on stress, as V = .251, F(2, 42) = 7.03, p = .002, and stress*group, as V = .457, F(2, 42) = 17.7, p < .001. Parametric assumptions in the analysis are met. The within-subjects analysis shows a statistically significant effect, as F(1, 43)= 9.42, p< .001, Partial η^2= .180. The between-subjects analysis presents a statistically significant effect of the intervention on stress, as F(1, 43)= 4.97, p= .031, Partial η^2= .104. The Bonferroni Post-hoc test shows that there is a statistical difference between T1 and T2 (p= .028, 95% CI [.286, 6.63]) and between T1 and T3 (p= .002, 95% CI [1.62, 7.96]). In contrast, the Post-hoc Bonferroni shows no statistical differences between T2 and T3 (p< .318, 95% CI [-.677, 3.34]). Graph 2 illustrates the differences observed between the two groups.

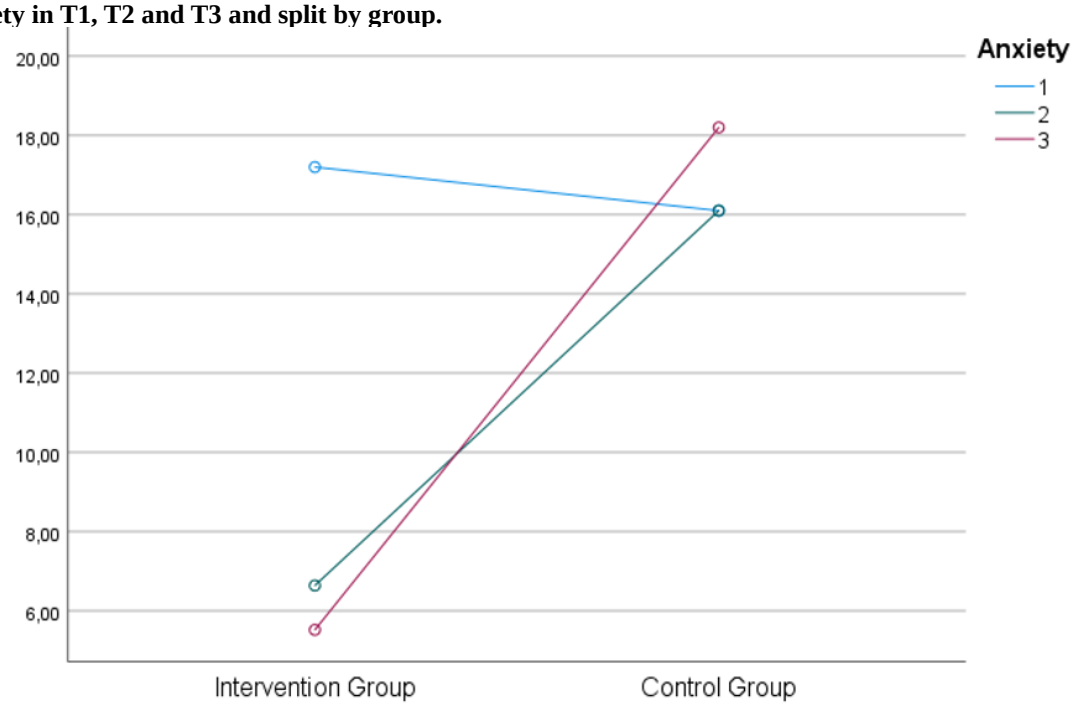
Graph 2. Illustration of the efficacy of the new intervention based on the differences in mean scores of stress in T1, T2 and T3 and split by group.



DASS-21, anxiety subscale (Anxiety)

In regard to anxiety, Pillai's trace presents a significant effect of the intervention on self-reported level of anxiety, as V = .366, F(2, 42) = 12.1, p < .001, and on anxiety*group, as V = .452, F(2, 42) = 17.3, p < .001. The parametric assumptions in the analysis are met. The within-subjects analysis show a significant effect, as F(2, 86)= 18.34, p< .001, Partial η^2= .299. The between-subjects analysis presents a statistically significant effect of the intervention on anxiety, as F(1, 43)= 9.36, p= .004, Partial η^2= .179. The Bonferroni Post-hoc test shows that the there is a statistical difference between T1 and T2 (p< .001, 95% CI [2.61, 7.94]) and between T1 and T3 (p< .001, 95% CI [1.88, 7.69]). In contrast, the Post-hoc Bonferroni shows no statistical differences between T2 and T3 (p= .528, 95% CI [-1.81, .825]). Graph 3 illustrates the differences observed between the two groups.

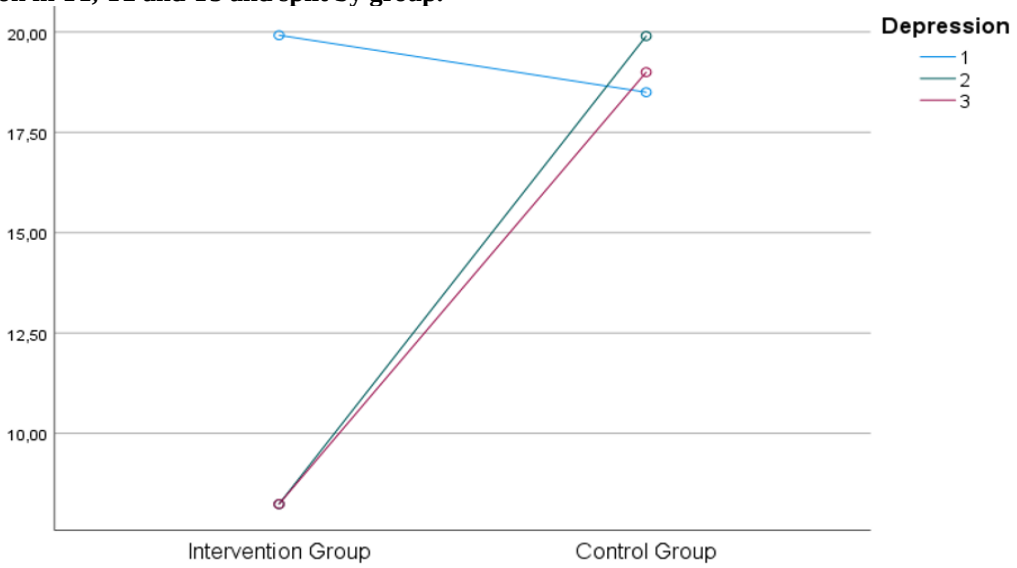
Graph 3. Illustration of the efficacy of the new intervention based on the differences in mean scores of anxiety in T1, T2 and T3 and split by group.



DASS-21, depression subscale (Depression)

In the case of the self-reported levels of depression, Pillai's trace illustrates a significant effect of the intervention on depression scores, as V = .285, F(2, 42) = 8.37, p < .001 and on depression*group, as V = .378, F(2, 42) = 12.77, p < .001. The parametric assumptions were met. The between-subjects analysis presents a statistically significant effect, as F(2, 86)= 14.39, p< .001, Partial η^2= .251. The between-subjects analysis presents a statistically significant effect of the intervention on depression, as F(1, 43)= 5.93, p= .019, Partial η^2= .121. The Bonferroni Post-hoc test presents that the there is a statistical difference between T1 and T2 (p< .001, 95% CI [1.95, 8.33]) and between T1 and T3 (p< .001, 95% CI [2.12, 9.06]). In contrast, the Post-hoc Bonferroni shows no statistical differences between T2 and T3 (p= 1, 95% CI [-1.21, 2.11]). Graph 4 illustrates the differences observed between the two groups.

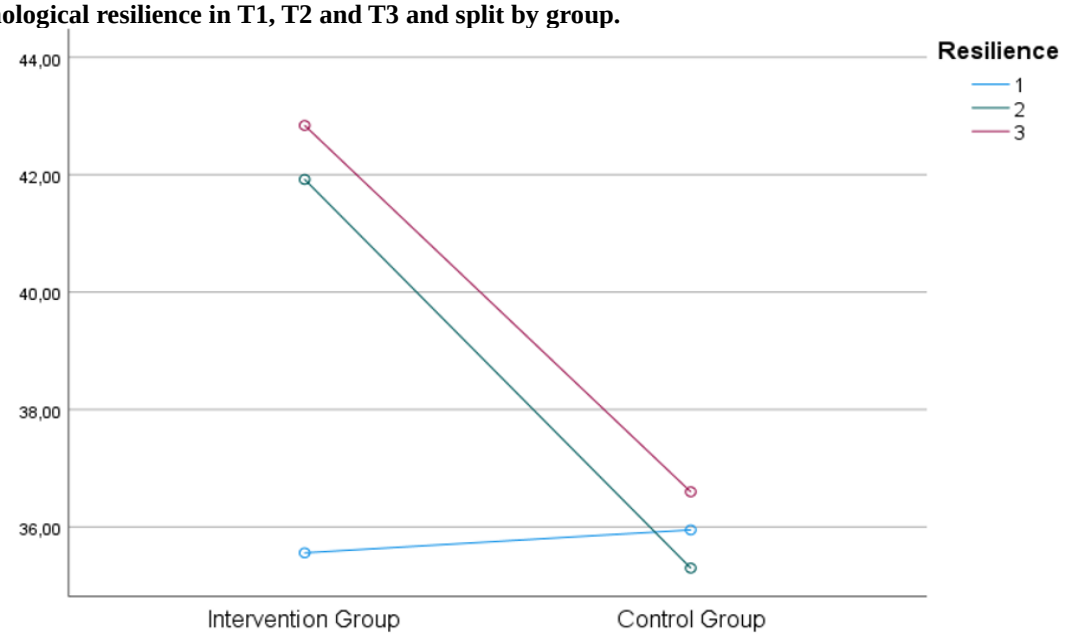
Graph 4. Illustration of the efficacy of the new intervention based on the differences in mean scores of depression in T1, T2 and T3 and split by group.



NMRQ (Psychological Resilience)

Regarding resilience, Pillai's trace illustrates a significant effect of the intervention on resilience scores, as V = .227, F(2, 42) = 6.18, p= .004, and on resilience*group, as V = .266, F(2, 42) = 7.62, p= .002. The parametric assumptions were met. The within-subjects analysis shows a significant effect, as F(2, 86)= 9.76, p= .001, Partial η^2= .185. The between-subjects analysis presents a statistically significant effect of the intervention on resilience, as F(1, 43)= 4.86, p= .033, Partial η^2= .101. The Bonferroni Post-hoc test presents that there is a statistical difference between T1 and T2 (p= .008, 95% CI [-5.07, -.636]) and between T1 and T3 (p= .003, 95% CI [-6.8, -1.12]). In contrast, the Post-hoc Bonferroni shows no statistical differences between T2 and T3 (p= .352, 95% CI [-2.84, -.62]). Graph 5 illustrates the differences observed between the two groups.

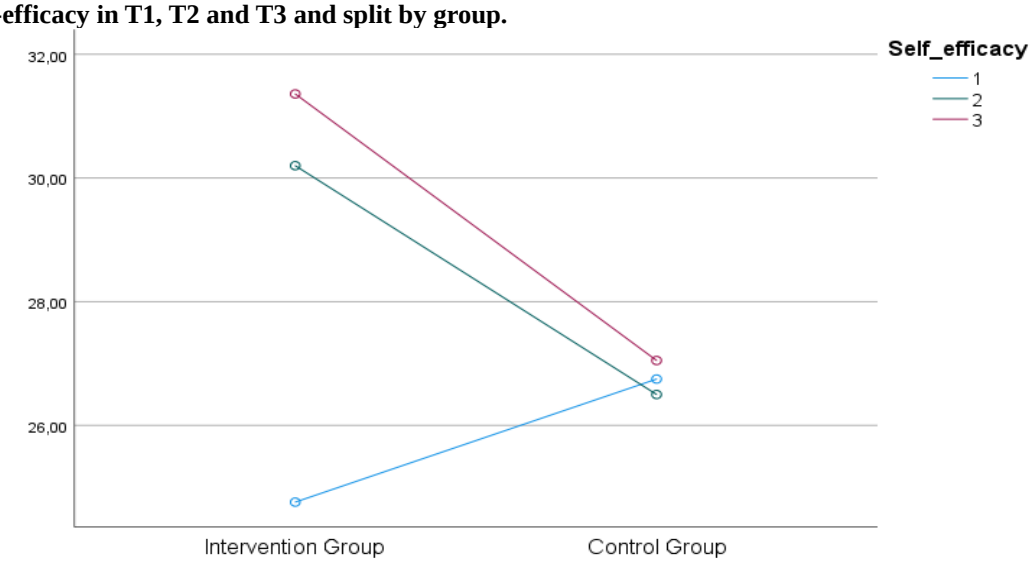
Graph 5. Illustration of the efficacy of the new intervention based on the differences in mean scores of psychological resilience in T1, T2 and T3 and split by group.



GSE (General Self-Efficacy)

Regarding self-efficacy, Pillai's trace shows that there is a significant effect of the new intervention on self-efficacy, as V = .197, F(2, 42) = 5.14, p= .01, and on self-efficacy*group, as V = .188, F(2, 42) = 4.85, p= .013. The parametric assumptions in the statistical analysis are met. The within-subjects analysis shows that there is a statistically significant effect of the intervention on self-efficacy, as F(2, 86)= 7.03, p< .001, Partial η^2= .141. In contrast, the between-subjects analysis shows that there is not a statistically significant effect of the intervention on self-efficacy, as F(1, 43)= 1.51, p= .226, Partial η^2= .034. The Bonferroni Post-hoc test shows that the there is a statistical difference between T1 and T2 (p= .034, 95% CI [-5.04, -.153]) and between T1 and T3 (p= .008, 95% CI [-6.14, -.762]). Post-hoc Bonferroni shows no statistical differences between T2 and T3 (p= .861, 95% CI [-2.83, 1.12]). Graph 5 illustrates the differences observed between the two groups.

Graph 5. Illustration of the efficacy of the new intervention based on the differences in mean scores of self-efficacy in T1, T2 and T3 and split by group.



DISCUSSION

The present study was conducted with a view to provide the first evidence of a new intervention against stress development and psychosomatics on a sample of health professionals delivered by two individual instructors throughout the spread of COVID-19 in Greece. The results of the study show that the intervention had an overall positive effect for the participants. More specifically, the intervention group shows lower levels of stress, anxiety, depression and psychosomatic symptoms in comparison to the group did not receive any intervention. What is more, the experimental group increased the self-reported measures of resilience and self-efficacy when compared to the non-experimental group. It is noteworthy that three months after the end of the delivery of the new intervention the group that received it, was likely to retain the benefits.

As far any comparisons of the present results with previous studies are concerned, it is obvious that there no direct comparisons since this is the first time the method was used in real life. However, some support comes from RCTs that tried to investigate relevant questions. For instance, CBT was found effective against stress- and anxiety- related conditions after the COVID-19 in a study of 60 participants in India (Shekhawat & Sharma, 2022). In Germany, the efficacy of a newly developed cognitive-behavioral intervention for individuals with post-COVID-19 condition was tested in a sample of 64 inpatients who fulfilled WHO criteria for post-COVID-19

condition (Huth et al., 2024). The authors of the study reported that the new cognitive-behavioral intervention was found feasible and acceptable (Huth et al., 2024). Moreover, a study in Sweden employed a sample of 670 Swedish from the general population that received a 3-week self-guided online cognitive behavioural intervention that was designed to decrease levels of dysfunctional COVID-19 worry and associated symptoms (Wahlund et al., 2020). The results of the study show that the intervention indeed decreased the targeted self-reported levels of dysfunctional worry and associated behavioural symptoms related to the COVID-19 pandemic (Wahlund et al., 2020).

From the perspective of resilience and self-efficacy, again, there is some support in favor of the outcomes of this study from previous literature. Specifically, an Iranian study of 30 COVID-19 patients showed increase in resilience after a CBT intervention (Mohammadi et al., 2022), while a recent study on pregnant women from Spain reported significant results in favor of resilience after the sample received an online CBT during COVID-19 (Puertas-Gonzalez et al., 2022; N= 207). What is more, a digital version of CBT was found to increase self-efficacy in insomnia patients during the COVID-19 spread in the USA (Cheng et al., 2022; N= 208), as well as an Iranian study presented that both face-to-face and online CBT increased self-efficacy on Diabetes management of relevant patients throughout the COVID-19 wave in the country (Mottaghi et al., 2022).

Considering the limitations of the present of this study, the first issue to be communicated is that the health professionals received an intervention during the COVID-19 spread in Greece. Hence, it is quite likely that the initial levels in the self-reported measures are not representative to the health professionals under normal everyday life conditions. When it comes to the delivery of the intervention, as reported in this study the instructors were experienced. Therefore, there is a possibility that the efficacy of the intervention relies partly or largely to the therapeutic competence of the instructors. Moreover, another key limitation is that any loses in participation -as shown in the flowchart- did not provide any information on quitting. As a result, it is currently unknown whether this had to do with the intervention or not. In addition, the intervention group was measured 3 months after the intervention ended to provide evidence in retaining the benefits of this intervention. The 3-months period is reflected by the authors as quite a minimum amount of time.

Consequently, as far as any future studies are concerned, it is highly recommended that future RCTs include further measurements. For instance, adding extra measurements in periods of 6-months, 9-months and 12-months would be greatly beneficial on illustrating the efficacy of the intervention on time. Additionally, any future studies may replicate the present RCT with another sample with different background and with other instructors delivering the intervention.

CONCLUSION

To conclude, the present study was conducted to present the efficacy of a new behavioral intervention against the development of psychosomatic symptoms and stress throughout the COVID-19 pandemic in Greece. Although the method aimed in reducing psychosomatic symptoms, stress, anxiety and depression levels in self-reported measures, it also aimed to increase self-efficacy and resilience. The results present that there are indeed statistical differences between the experimental and the control group in all measures and timeframes. More specifically, the intervention group decreased the self-reported levels of psychosomatic symptoms, stress, anxiety and depression, while increased self-efficacy and resilience from baseline to the end of the intervention. It is noteworthy that any benefits of the intervention remained for

a short period of no more than 3 months after the intervention was ended. Furthermore, the analysis shows statistically significant differences between the two groups. The later results favor the use of the present intervention at this very early stage of development. A great limitation to this study is that the number of participants is quite limited, while the follow-up measurement took place only 3 months after the end of delivery of the intervention. Future studies may test if the benefits remain after the 3-month period, as well as design studies on different populations and have the intervention delivered by different instructors.

Declaration by Authors

Ethical Approval: The study was ethically approved in September 2020, by the CUC Research Committee in Athens, Greece. The protocol follows the Declaration of Helsinki, the Research Ethics of the British Psychological Society for human subjects on physical and online research, and the General Data Protection Regulation.

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