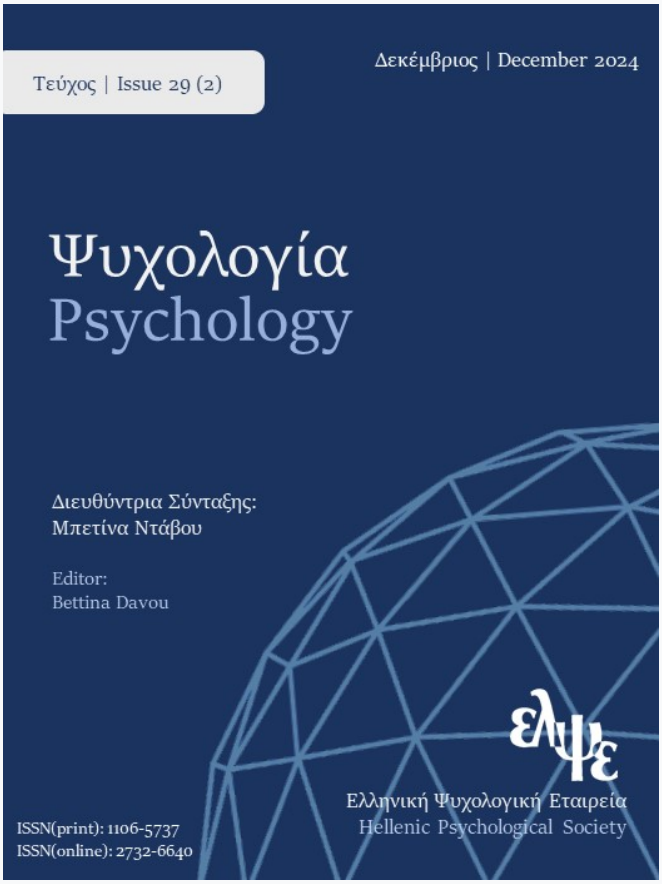
Psychology: the Journal of the Hellenic Psychological Society

Vol 29, No 2 (2024)

December 2024



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doi: 10.12681/psy_hps.39621

To cite this article:

Kalaitzaki, A., Tamiolaki, A., & Tsouvelas, G. (2024). A unique combination of coping strategies promotes each domain of post-traumatic growth during COVID-19: Differences between community residents and healthcare workers. *Psychology: The Journal of the Hellenic Psychological Society*, *29*(2), 389–407. https://doi.org/10.12681/psy_hps.39621

ΨΥΧΟΛΟΓΙΑ | PSYCHOLOGY, 29(2), 389-407

Ελληνική Ψυχολογική Εταιρεία
Hellenic Psychological Society

ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

A unique combination of coping strategies promotes each domain of post-traumatic growth during COVID-19: Differences between community residents and healthcare workers

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KEYWORDS

Posttraumatic growth
Coping strategies
General population
Heath professionals
COVID-19
Pandemic
Coronavirus disease

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ABSTRACT

Undeniably the COVID-19 pandemic has resulted in unprecedented threats and severe traumas for human beings. However, for a proportion of people, the struggle with this crisis has led to positive mental health outcomes, known as posttraumatic growth (PTG). This study compared the PTG levels between community residents and healthcare workers (HCWs) across two time points and identified the coping strategies that promote each PTG domain separately. An online questionnaire was administered to 2,437 respondents (499 and 253 HCWs and 1157 and 528 community residents, at timepoints 1 and 2, respectively). The Post-Traumatic Growth Inventory assessed the five PTG domains and the Brief COPE the coping strategies. After controlling for gender, age, and education, ANCOVA showed a significant interaction effect; although HCWs had lower scores on PTG compared to community residents at T1, at T2 they had significantly higher scores. The coping strategies of positive reframing and religion positively predicted all PTG domains among both groups. Denial was the third most frequently used strategy, followed by active coping. On the other hand, certain coping strategies were unique predictors of specific PTG domains or groups. Self–Distraction predicted community residents' Personal Strength (also Behavioral Disengagement) and Appreciation of life, Emotional Support predicted community residents' Relating to others and HCWs' Appreciation of life, and self-blame predicted HCWs' Relating to others and Personal Strength. The identification of these compilations of coping strategies for each PTG domain can guide preventive training programs targeting specific coping strategies that need to be enhanced in each sampling group.

Introduction

The COVID-19 pandemic has been considered a traumatic event (Shevlin et al., 2020) resembling collective traumas (e.g., natural disasters) that have features such as unknown/unfamiliar danger, being extreme, unpredictable, prolonged, and life-threatening (Watson et al., 2020). The fear of contagion, the high mortality rate, the 'lockdowns', the strict quarantine measures, and the social isolation typify such events. Rightfully so, COVID-19 has been considered a new type of mass trauma (Sanchez-Gomez et al., 2021) with rippling effects on all aspects of one's life. The detrimental global toll of COVID-19 on mental health has been thoroughly recorded, including increases in depression, anxiety, and post-traumatic stress among the general population

https://doi.org/10.12681/psy_hps.39621

Ψυχολογία: Το Περιοδικό της Ελληνικής Ψυχολογικής Εταιρείας
https://ejournals.epublishing.ekt.gr/index.php/psychology

(Pashazadeh Kan et al., 2021; Xiong et al., 2020) and healthcare workers (Kalaitzaki et al., 2022; Zhou et al., 2021).

Notwithstanding the unequivocal adverse mental health effects of COVID-19, quite many researchers (e.g., Kalaitzaki et al., 2020; Yu et al., 2023; Yıldız, 2021) have also revealed that positive outcomes may occur. Posttraumatic growth (PTG) appears as a response to the struggle and coping with a major adversity. Cumulative evidence has shown PTG in the general population (Arnout & Al-Sufyani, 2021; Kalaitzaki, Tsouvelas et al., 2023; Zhou et al., 2021). A corresponding growing body of research also exists among healthcare workers (doctors, nurses social workers, and psychotherapists) (Chen et al., 2021; Cui et al., 2021; Kalaitzaki & Rovithis, 2021; Kalaitzaki et al., 2021; Tamiolaki et al., 2024. A recent scoping review identified 36 studies on PTG among medical staff during the COVID-19 pandemic (Li et al. 2024), and a systematic review and meta-analysis identified 55 studies among nurses (Wang et al., 2024), all showing moderate levels of PTG. Healthcare workers' growth as a result of watching their clients' efforts to overcome adversity is known as vicarious post-traumatic growth (VPTG; Tsirimokou, et al., 2022). The available literature (Tedeschi & Calhoun, 2004; Tedeschi et al., 2018) indicates that VPTG is similar to PTG and both result in improvements in five domains that can arise independently or coexist: increased personal strength (e.g., improved self-efficacy and self-confidence), recognition of new possibilities in life (e.g., readiness to redefine priorities and take new paths in life), enriched existential/spiritual life or spiritual development (e.g., existential/philosophical questions and deeper understanding of spiritual issues), increased appreciation of life (e.g., attributing worth in small or even trivial things in life), and more meaningful relationships with others (e.g., increased compassion, warmer, closer and more meaningful relationships with others) (Calhoun & Tedeschi, 2014; Tedeschi & Calhoun, 1996).

Given that Janoff-Bulman (2004) has suggested that different psychological processes may result in distinct PTG domains, acknowledging the process through which each of these five domains develops might be particularly important. Calhoun and Tedeschi (2014) have proposed that an individual's coping strategies are potentially associated with their growth process. Coping strategies describe people's behavioral and cognitive efforts to minimize the negative effects of a difficult life situation and are employed when needs surpass resources (Girma et al., 2021). Typically, coping strategies are grouped into adaptive (i.e., active coping, instrumental support, planning, acceptance, emotional social support, humour, positive reframing, and religion) and maladaptive (i.e., behavioral disengagement, denial, self-distraction, self-blaming, substance use, and venting) (Meyer, 2001). Individuals with insufficient coping behaviours, may not succeed in developing PTG, whereas those with adaptive coping strategies, may flourish after a life-threatening condition.

Studies during COVID-19 have indicated that diverse coping strategies increase the likelihood of PTG. In a series of studies conducted by Kalaitzaki and her colleagues during the first lockdown, it was found that both adaptive (i.e., positive reframing, religious coping, use of emotional support) and maladaptive coping strategies (i.e., self-blame, denial, and substance use) were associated with PTG among a general population sample (Kalaitzaki et al., 2022, Kalaitzaki, Tsouvelas et al., 2023) and a sample of healthcare workers (Kalaitzaki, Tsouvelas, et al., 2021; Kalaitzaki & Rovithis, 2021). However, other studies, during the same period, found that only positive/adaptive coping strategies were associated with PTG among the general population and discharged COVID-19 patients (e.g., Fino et al., 2022; Yan et al., 2021) and healthcare workers (Prekazi et al., 2021; Zhang et al., 2021). During the second lockdown, the majority of the studies have shown that mostly adaptive coping strategies (i.e., positive reframing, religious coping, active coping, and use of instrumental support) contribute to PTG among the general population and COVID-9 patients (Gökalp et al., 2022; Kalaitzaki, Tsouvelas et al., 2022) and healthcare workers (Kalaitzaki, Tamiolaki et al., 2023; Kalaitzaki et al., 2024). Specific specialties, such as social workers seem to use adaptive coping strategies (i.e., instrumental support and religious) from the first lockdown (Tamiolaki et al., 2024). Nor reviews have reached a unanimous agreement, since they have shown that either positive/adaptive coping (Finstad et al., 2021; Henson et al., 2021) or both adaptive and maladaptive coping contribute to PTG (Bovero et al., 2024). A recent review on

paramedicine clinicians has also provided inconclusive findings, showing PTG positively correlating with both adaptive and maladaptive coping (Coyte et al., 2024). Nonetheless, identifying the coping strategies used in dealing with traumatic events has the potential to differentiate real from illusory PTG (Eissenstat et al., 2024). For example, it has been proposed that over time maladaptive coping such as avoidance promotes illusory and not real PTG (Xie & Kim, 2022).

It is worth noting that studies have generally examined the overall PTG development rather than the specific PTG domains and no study has examined which coping strategies contribute to specific PTG domains during the COVID-19 pandemic among the general population or healthcare workers. Previous research in cancer survivors (Morris et al., 2007) and in emergency service workers (Shakespeare-Finch, 2002) have shown that adaptive coping strategies such as positive reframing, seeking social support (both emotional and instrumental), and active coping contribute to changes in new possibilities in life and relationships with others. To the authors' knowledge, Joy et al's study (2023) is the only one that examined separately the five PTG domains among COVID-19 survivors, but it did so in relation to the three coping groups (i.e., problem-focused, emotion-focused, and avoidance coping), and thus it failed to specifically recognize the certain strategies that contributed to each PTG domain. Potentially identifying the pairings between specific coping strategies and PTG domains may act as a guide to developing tailored person-centered interventions to promote individuals capable of thriving in the domains of PTG most in need in the aftermath of significant challenges.

The aim of the current study was to compare the PTG levels between community residents and healthcare workers (HCWs) across two time points and identify the coping strategies that promote each PTG domain separately.

Method

Sampling procedure and Participants

The data were collected during the first (March 23 –May 03, 2020) and the second COVID-19 lockdown (November 7, 2020–May 15, 2021) in Greece. An online Google form questionnaire was created and the link was spread across the country through emails, sites, and social networks (e.g., Facebook, Instagram, LinkedIn). The informed consent and a clickable "I agree" option were presented to the participants. The study was following the 1964 Helsinki Declaration and its later amendments. The Ethics Committee of the Hellenic Mediterranean University approved the study.

Overall 2,437 respondents (N =1,656 during the 1st timepoint, T1; and N =781 during the 2nd timepoint, T2) were recruited, after excluding 15 cases with missing data and/or aged below 18 years (for the community residents). There were 752 healthcare workers (HCWs; 33.1% physicians, 33.8% nurses, 21.6% psychologists, and 11.6% social workers) and 1685 community residents. Their mean age was 38.1 years (*SD* = 12.2; range 18-74), mostly females (78%), and holders of a university degree (49.9%). Inclusion criteria were: being Greeks, aged over 18, and consenting to participate in the study. Additional inclusion criteria for the HCWs were working in any healthcare facility (e.g., hospital, community center). Table 1 summarises the sociodemographic data of the samples.

Instruments

PTG and coping strategies were assessed twice. Time 1 (T1) assessed data collected from 5 to 30 April 2020 (first lockdown) and Time 2 (T2) assessed the data collected from 15 November to 12 December (second lockdown). The measures were the following:

The **Post-Traumatic Growth Inventory** (PTGI; Tedeschi & Calhoun, 1996; Kalaitzaki et al., 2020) was used to measure PTG. It consists of 21 items allocated in five subscales: relationship to others (e.g., "I have a greater sense of closeness with others"), new possibilities (e.g., "I developed new interests"), personal strength (e.g., "I more clearly see that I can count on people in times of trouble"), spiritual change (e.g., "I have a better

understanding of spiritual matters"), and appreciation of life (e.g., "I changed my priorities about what is important in life"). Items are scored on a 6-point scale, ranging from 0 (I did not experience this change) to 5 (I experienced this change to a very large extent). Participants were instructed to consider the change experienced after the COVID-19 pandemic. A total score and five subscale scores were calculated, with higher scores suggesting higher growth levels. Scores ≤45 suggest none/low PTG, while scores ≥46 suggest moderate/high PTG (Mazor et al., 2016). The reliability (Cronbach's α) of the PTGI in this study was .95.

Table 1. *Sociodemographic features of the total sample, and per group, during the two time points*

	Total		Community residents		HCWs		1st Timepoint		2nd Timepoint	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Timepoint										
1st Timepoint	1656	68.0	1157	68.7	499	66.4	-	-	-	-
2nd Timepoint	781	32.0	528	31.3	253	33.6	-	-	-	-
Group										
Community residents	1685	69.1	-	-	-	-	1157	69.9	528	67.6
HCWs	752	30.9	-	-	-	-	499	30.1	253	32.4
Gender										
Female	1900	78.0	1334	79.2	566	75.3	1251	75.5	649	83.1
Male	537	22.0	351	20.8	186	24.7	405	24.5	132	16.9
Age (Mean & SD)[1]	38.1	12.2	35.7	12.4	43.5	9.9	39.2	12.3	39.2	12.3
Number of children										
0	1272	54.4	1038	61.6	234	35.8	830	50.1	442	64.8
1-2	901	38.6	547	32.4	354	54.2	702	42.4	199	29.2
3 +	165	7.0	100	6.0	65	10.0	124	7.5	41	6.0
Educational level										
Up to high school	423	17.4	329	19.6	94	12,5	205	12,3	218	27,9
University	1216	49.9	834	49.5	382	50.8	848	51.2	368	47.1
Master's/Doctorate	798	32.7	522	31.0	276	36.7	603	36.4	195	25.0

**Note.* Numbers are means and SDs.

The **Brief COPE** (Coping Orientation to Problems Experienced Inventory; Carver, 1997; Kapsou et al., 2010) was used to measure coping strategies. It comprises 28 items in 14 subscales of two items each: positive reframing, active coping, self-distraction, denial, substance use, use of emotional support, behavioral disengagement, venting, planning, humour, acceptance, religious coping, self-blame, and use of instrumental support. Using a scale ranging from 0 (not at all) to 4 (very much), participants were invited to rate the frequency of using each strategy to deal with the COVID-19 pandemic. Example items for the 14 Brief COPE scales are as follows: Planning: "I've been thinking hard about what steps to take."; Humour: "I've been making jokes about it". The reliability (Cronbach's α) of the Brief COPE in this study was .83.

Socio-Demographic Questionnaire. Sociodemographic data (e.g., gender and age) were also collected.

Statistical analyses

Mazor et al's (2016) threshold of above 46 designated moderate to very high VPTG levels. A two-way Analysis of Covariance (ANCOVA) was performed to examine the interaction effect of timepoint (T1 vs T2) and group (HCWs vs community residents) on PTG, after controlling for gender, age, and educational level. A series of

hierarchical multiple regression analyses (stepwise method) were conducted for the prediction of PTG and its domains by demographic factors and coping strategies per group (HCWs and community residents). Demographic variables (i.e., gender, age, education, number of children, and Timepoint) were entered in the first step and coping strategies in the second step. All analyses were performed with IBM SPSS v23 and the significance level was set at $p < .05$. Partial eta squared (η^2) and Cohen's F^2 provided indices of effect size.

Results

Descriptive statistics and PTG levels

Means and SDs for posttraumatic growth (total and its domains) and coping strategies, by group and by Timepoint are provided in Table 2. Applying the 46-cutoff score, 1,309 (53.7%) of the total sample displayed moderate to high levels of PTG. There were 869 (52.5%) participants in T1, 440 (56.3%) in T2, 904 (53.6%) community residents, and 405 (53.9%) HCWs.

Table 2. *Means and SDs for posttraumatic growth and coping strategies by group and by time point*

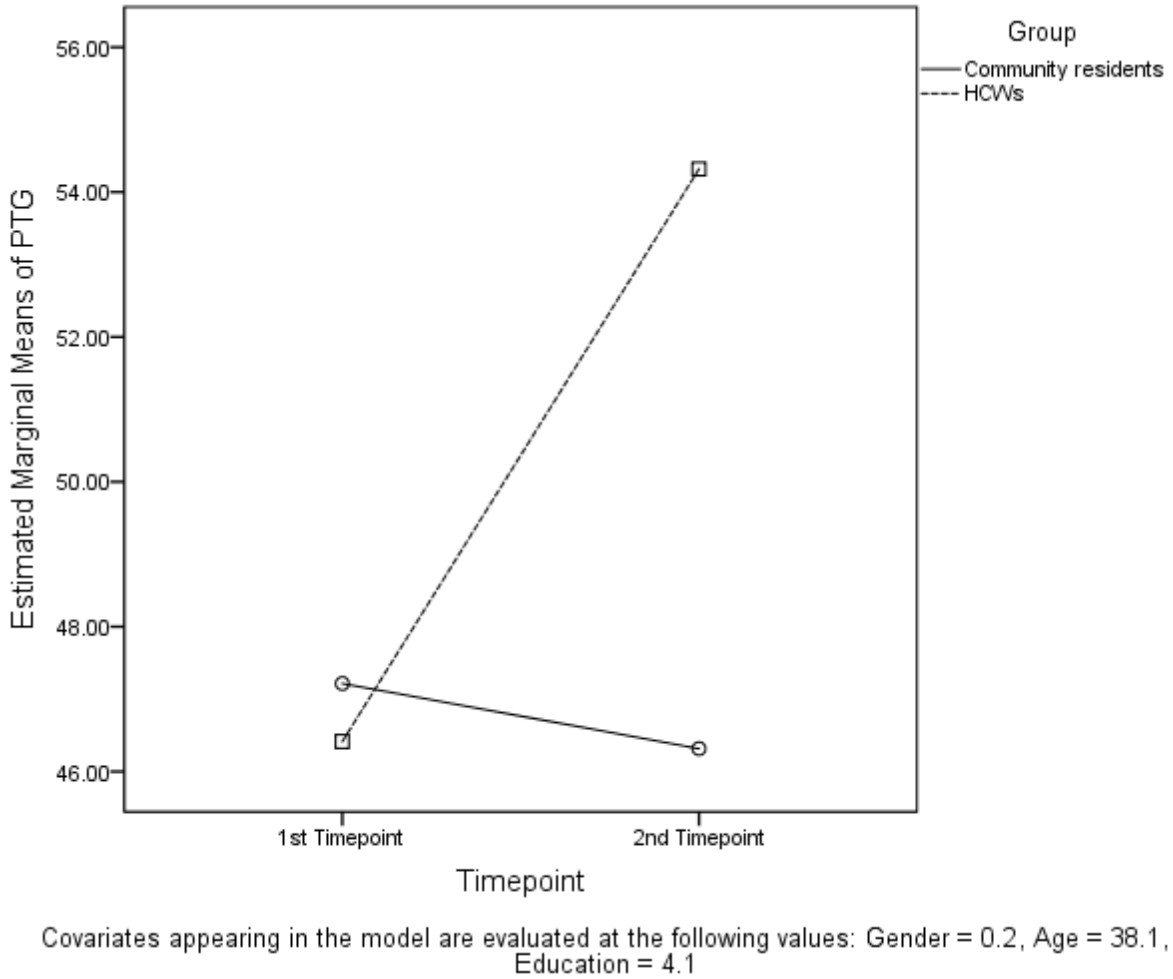
			Group				**Timepoint**			
	Total sample		Community residents		HCWs		T1		T2	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
PTG										
Relating to others	15.2	9.2	15.3	9.2	14.9	9.1	14.8	9.2	16.1	9.0
New possibilities	10.6	6.4	10.7	6.5	10.6	6.3	10.5	6.4	11.0	6.4
Personal Strength	10.0	5.5	9.7	5.6	10.7	5.3	9.8	5.6	10.5	5.3
Spiritual Change	3.6	3.0	3.4	3.0	3.9	3.1	3.5	3.0	3.8	3.1
Appreciation of life	8.2	4.1	8.0	4.2	8.4	4.1	8.1	4.2	8.3	4.1
Total	47.6	25.0	47.2	25.1	48.6	24.7	46.6	25.3	49.7	24.3
COPE										
Self-distraction	6.1	1.5	6.0	1.5	6.3	1.4	6.2	1.5	5.9	1.4
Active coping	5.9	1.5	5.9	1.6	5.9	1.5	5.9	1.5	5.9	1.5
Denial	3.5	1.5	3.4	1.5	3.7	1.6	3.5	1.5	3.6	1.5
Substance use	2.4	1.1	2.5	1.2	2.4	1.0	2.4	1.1	2.5	1.2
Use of emotional support	5.1	1.8	5.2	1.8	5.0	1.8	5.0	1.8	5.5	1.7
Use of instrumental support	4.9	1.8	5.0	1.8	4.9	1.8	4.8	1.8	5.3	1.7
Behavioral disengagement	2.9	1.3	3.0	1.4	2.8	1.2	2.9	1.3	3.1	1.4
Venting	5.1	1.6	5.0	1.6	5.1	1.6	4.9	1.6	5.3	1.6
PositiveReframing	6.1	1.6	6.0	1.6	6.1	1.5	6.1	1.6	5.9	1.6
Planning	6.1	1.6	6.1	1.6	6.2	1.5	6.1	1.6	6.1	1.6
Humour	4.7	1.7	4.7	1.7	4.6	1.6	4.6	1.6	4.8	1.7
Acceptance	6.1	1.5	6.0	1.5	6.3	1.4	6.2	1.5	5.9	1.4
Religion	4.0	1.9	3.9	1.9	4.2	1.9	4.0	1.9	4.0	2.0
Self-Blame	4.3	1.7	4.4	1.7	4.3	1.6	4.1	1.7	4.7	1.7

**Note. PTG = posttraumatic growth; Score ranges for Relating to others 0-35; New possibilities 0-25; Personal Strength 0-20; Spiritual Change 0-10; Appreciation of life 0-15; Total 0-110; COPE Self-distraction to Self-Blame 2-8.*

Group and Timepoint differences in PTG

The ANCOVA showed that the main effects of the independent variables on PTG were statistically significant, after controlling for gender, age, and education ($F(6,2436) = 11.7$, $p < .001$, $\eta^2 = .028$). There was a significant effect of Timepoint ($F(1,2430) = 8.9$, $p = .003$, $\eta^2 = .004$), with higher scores at T2 ($M = 50.3.7$, $SE = 0.9$) compared to T1 ($M = 46.8$, $SE = 0.7$), and of Group ($F(1,2430) = 8.9$, $p = .003$, $\eta^2 = .004$), with higher scores at HCWs ($M = 50.4$ $SE = 1.0$) compared to community residents ($M = 46.8$, SE = 0.7). There was also a significant interaction effect between the two independent variables ($F(1,2430) = 14.5$, $p < .001$, $\eta^2 = .006$) showing community residents at T1 having higher scores on PTG ($M = 47.2$, $SE = 0.7$) compared to HCW's group ($M = 46.4$, $SE = 1.1$), whereas at T2, HCWs had higher scores ($M = 54.3$, $SE = 1.6$) compared to community residents ($M = 46.3$, $SE = 1.1$) (Figure 1).

Figure 1. *Interaction effect of timepoint (T1 vs T2) and group (HCWs vs community residents) on Post Traumatic Growth (PTG)*



**Note. Gender (0=male, 1= female)*

Statistical prediction of PTG and its domains by demographic factors and coping strategies per group (HCWs and community residents)

Total PTG score was predicted in both groups (HCWs and community residents) by the strategies of Active coping, Denial, Use of instrumental support, Positive Reframing, and Religion. In addition, Self-blame and Substance use inversely predicted total PTG among community residents and HCWs, respectively. The educational level inversely predicted total PTG among HCWs too (see Table 3).

Relating to others was predicted in both groups by the strategies of Denial, Use of instrumental support, Positive reframing, Religion, and Self-blame (inversely in community residents and positively in HCWs). Relating to others was also predicted by the Use of emotional support among community residents and by educational level (inversely), Substance use (inversely), and Behavioral disengagement (inversely) among HCWs (see Table 3). *New possibilities* were predicted in both groups by the strategies of Active coping, Use of instrumental support, Positive reframing, and Religion. Among HCWs, New possibilities were also predicted by age (inversely), number of children, and Denial (see Table 4). *Personal Strength* was predicted in both groups by the strategies of Self-distraction, Active coping, Behavioral disengagement (positively among community residents and negatively among HCWs), Positive reframing, Religion, and Self-blame (negatively among community residents and positively among HCWs). Among HCWs, Personal Strength was also predicted by educational level (inversely) and Denial (see Table 4). Spiritual change was predicted in both groups by Denial, Positive reframing, and Religion. Among community residents, Spiritual change was also predicted by Self-distraction (inversely) and Self-blame (inversely), and among HCWs, by the number of children, educational level (inversely), timepoint (with higher scores in Timepoint 2), Active coping, Substance use (inversely), Planning (inversely) and Humor (inversely) (see Table 5). *Appreciation of life* was predicted in both groups by Active coping, Denial, Positive reframing, and Religion. Among community residents, it was also predicted by gender (with females having higher scores), Self-distraction, Use of instrumental support, and Humor (inversely), whereas, among HCWs, Appreciation of life was predicted by number of children, Substance use (inversely) and Use of emotional support (see Table 5).

Discussion

This study was an attempt to compare community residents and HCWs' PTG levels across two time points and identify the coping strategies that promote each PTG domain separately. HCWs experienced higher levels of PTG than community residents during the second lockdown. Since exposure to challenging circumstances is needed for PTG (Kalaitzaki, Tsouvelas et al., 2022), researchers (Yılmaz-Karaman et al., 2022; Vindegaard & Benros, 2020) have found HCWs were not only more vulnerable to trauma than the general population due to their critical role during COVID-19 but also more likely to grow. Since severe trauma may be more harmful than helpful to growth (Li et al., 2024), PTG interventions are of great importance for safeguarding HCWs not to exceed a critical level of distress (Yan et al., 2022). Furthermore, the results of this study can partially answer the question of whether PTG is an illusion or a real positive change. Since HCWs' levels of PTG increased over time and community residents' PTG levels remained stable, both of them might have experienced real and constructive growth. According to literature (Zoellner & Maercker, 2006; An et al., 2017), in the initial phases of adjustment, PTG may primarily act as a self-enhancing illusion, an effort of self-protection to assist individuals alleviate emotional distress, which later reduces. However, real/constructive growth comes about if they remain in this "positive illusion" long enough.

Among the array of coping strategies recognized in this study, two adaptive coping responses, positive reframing, and religious coping, contributed to all PTG domains (i.e., personal strength, appreciation of life, new possibilities, relating to others, and spiritual change) among both sampling groups. For this, it was hereinafter called the "golden dyad". It might be that people need to reinterpret the concussive experience in a positive way and religion offers such an outlet. The positive reinterpretation helps people reframe adversities as chances to learn about themselves, improve their relationships, and appreciate every aspect of their lives. Indeed, pre-COVID-19 studies and meta-analytic reviews have shown that positive reframing or else positive reappraisal (Blom et al., 2022; Helgeson, et al., 2006; Gil-González et al., 2022; Prati & Pietrantoni, 2009; Schroevers & Teo, 2008; Yeung et al., 2016) and religious coping (Ano & Vasconcelles, 2005; Prati & Pietrantoni, 2009) are among the most frequently-proven facilitators of PTG after challenging situations, and COVID-19 literature has largely consented to these findings (e.g., Kalaitzaki, Tsouvelas et al., 2022; Lee & Ahn, 2023; Nowicki, et al., 2024; Yeung et al., 2022).

Table 3. *Hierarchical regression analysis for predicting PTG and Relating to others by demographic factors and coping strategies*

	PTG total score								PTG: Relating to others							
	Community residents				HCWs				Community residents				HCWs			
	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b
Gender	1	–2.33	1.37	–0.04^{ns}	1	–2.61	1.92	–0.05^{ns}	1	–0.89	0.52	–0.04^{ns}	1	–1.24	0.72	–0.06^{ns}
Age																
Children																
Educational level					2	–4.62	1.30	–0.12***					2	–1.84	0.49	–0.13***
Timepoint																
Self–Distraction																
Active Coping	7	0.91	0.41	0.06*	5	2.22	0.66	0.14***								
Denial	5	1.53	0.38	0.09***	6	2.32	0.54	0.15***	5	0.63	0.14	0.10***	5	0.91	0.22	0.16
Substance Use					8	–1.99	0.78	–0.09*					7	–0.69	0.30	–0.08*
Use of Emotional Support									7	0.50	0.18	0.10**				
Use of Instrumental Support	4	1.85	0.34	0.13***	7	1.71	0.52	0.13***	2	0.74	0.18	0.15***	3	1.00	0.20	0.20***
Behavioral Disengagement													9	–0.70	0.30	–0.09*
Venting																
Positive Reframing	3	3.18	0.40	0.20***	3	2.67	0.62	0.17***	4	0.88	0.14	0.15***	4	0.93	0.22	0.16***
Planning																
Humor																
Acceptance																
Religion	2	3.15	0.31	0.24***	4	2.62	0.48	0.20***	3	0.82	0.12	0.17***	6	0.47	0.18	0.10**
Self–Blame	6	–1.04	0.34	–0.07**					6	–0.40	0.13	–0.08**	8	0.60	0.22	0.11**
R^2	.20				.27				.16				.24			
F^2	0.25				0.37				0.19				0.32			

**Note.* $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 4. *Hierarchical regression analysis for predicting New possibilities and Personal Strength by demographic factors and coping strategies*

	PTG: New possibilities								PTG: Personal Strength							
	Community residents				HCWs				Community residents				HCWs			
	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b
Gender	1	–0.43	0.36	-0.03^{ns}	1	–0.26	0.51	-0.02^{ns}	1	–0.40	0.32	-0.03^{ns}	2	–0.77	0.43	-0.06^{ns}
Age					2	–0.06	0.03	-0.10^{*}								
Children					3	1.04	0.51	0.08^{*}								
Educational level													1	–1.41	0.29	-0.17^{***}
Timepoint																
Self–Distraction									7	0.19	0.09	0.05^{*}	9	0.29	0.14	0.08^{*}
Active Coping	4	0.47	0.11	0.11^{***}	6	0.59	0.18	0.14^{***}	5	0.25	0.09	0.07^{**}	4	0.37	0.15	0.10^{*}
Denial					7	0.36	0.14	0.09^{*}					6	0.51	0.13	0.15^{***}
Substance Use																
Use of Emotional Support																
Use of Instrumental Support	5	0.28	0.08	0.08^{***}	8	0.31	0.14	0.09^{*}								
Behavioral Disengagement									4	0.28	0.08	0.08^{***}	7	–0.63	0.18	-0.14^{***}
Venting																
Positive Reframing	2	0.85	0.10	0.21^{***}	4	0.70	0.17	0.18^{***}	2	0.68	0.10	0.19^{***}	3	0.64	0.14	0.19^{***}
Planning																
Humor																
Acceptance																
Religion	3	0.61	0.08	0.18^{***}	5	0.47	0.13	0.14^{***}	3	0.47	0.07	0.16^{***}	5	0.35	0.11	0.12^{***}
Self–Blame									6	–0.19	0.08	-0.06^{*}	8	0.32	0.12	0.10^{**}
R^2	.17				.19				.16				.24			
F^2	0.20				0.23				0.19				0.32			

**Note.* $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 5. *Hierarchical regression analysis for predicting Spiritual change and Appreciation of life by demographic factors and coping strategies*

	PTG: Spiritual Change								PTG: Appreciation of life							
	Community residents				HCWs				Community residents				HCWs			
	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b	Step	B	SE	b
Gender	2	−0.01	0.14	0.00^{ns}	1	−0.15	0.20	−0.02^{ns}	1	−0.50	0.23	−0.05*	1	−0.58	0.33	−0.06^{ns}
Age																
Children	1	0.05	0.12	0.01^{ns}	4	0.47	0.18	0.07*	2	0.08	0.20	0.01^{ns}	2	0.96	0.30	0.11***
Educational level					3	−0.36	0.14	−0.08**					3	−0.44	0.23	−0.07^{ns}
Timepoint					2	0.92	0.21	0.13***								
Self–Distraction	7	−0.11	0.04	−0.05**					9	0.15	0.07	0.05*				
Active Coping					7	0.27	0.07	0.14***	6	0.24	0.07	0.09***	5	0.29	0.11	0.11**
Denial	5	0.15	0.04	0.08***	6	0.29	0.06	0.15***	5	0.30	0.06	0.11***	6	0.47	0.09	0.18***
Substance Use					11	−0.19	0.08	−0.07*					8	−0.37	0.14	−0.10**
Use of Emotional Support													9	0.24	0.09	0.10**
Use of Instrumental Support									7	0.19	0.06	0.08***				
Behavioral Disengagement																
Venting																
Positive Reframing	4	0.17	0.04	0.09***	9	0.22	0.07	0.11***	3	0.46	0.07	0.18***	7	0.37	0.11	0.14***
Planning					8	−0.19	0.07	−0.10**								
Humour					10	−0.16	0.06	−0.08**	8	−0.16	0.06	−0.06**				
Acceptance																
Religion	3	0.92	0.03	0.59***	5	0.91	0.05	0.55***	4	0.37	0.05	0.17***	4	0.41	0.08	0.19***
Self–Blame	6	−0.10	0.03	−0.06**												
R^2	.39				.47				.16				.24			
F^2	0.69				0.89				0.19				0.32			

The contribution of religion to all PTG domains among both groups was not a surprise either, as the possibilities of personal growth from life difficulties lie at the heart of all religious beliefs (Calhoun & Tedeschi, 2006). Shaw et al's (2005) systematic review of 11 empirical studies and Pankowski & Wytrychiewicz-Pankowska's (2023) review of 5 studies during COVID-19 demonstrated the association between religious coping and PTG. More studies have asserted the deepening of religiosity or spirituality and their contribution to facilitating PTG (Kalaitzaki, Tsouvelas et al., 2022; Prieto-Ursúa & Jódar, 2020). Interestingly, religious coping influenced every PTG domain (i.e., personal strength, appreciation of life, new possibilities, relating to others) in addition to the PTG Spiritual Change domain. It seems that the sense of proximity with a transcendent force and members of a religious community, the reinterpretation of life's challenges (e.g., "it is God's will"), and contemplation of existential matters and questions (Prati & Pietrantoni, 2009; Pargament et al., 2000; Tedeschi & Calhoun, 1996) help people gain greater personal strength, appreciation of small things in life, discover new possibilities, and improve relating to others. Examining whether the positive (e.g. considering death as a way to heaven, religious forgiveness) or negative (e.g. asking for a miracle, waiting for God to take charge of the situation) aspects of religious coping facilitate PTG should be a target of future research (Mardiah & Syahriati, 2015).

A seemingly maladaptive coping strategy, denial, was associated with all PTG domains in both groups, except New Possibilities and Personal Strength in community residents. Since denial was the third most frequently used coping strategy, its combination with positive reframing and religious coping was hereinafter called the "silver triad". The use of positive reframing, denial, and religion, may be interpreted to suggest that individuals turned to religion in order to deny and reframe the overwhelming circumstances. Avoidant coping may help people avoid immediate confrontation and rather shift their focus/attention from the overwhelming situation to other things (e.g., from losses to benefits and appreciation of life), thus relieving stress and promoting growth to a certain degree shortly after the trauma (Zoellner & Maercker, 2006). Indeed, there is an emerging body of literature (Brooks et al., 2019; Fu et al., 2022; Helgeson et al., 2006; Kalaitzaki, Tsouvelas et al., 2022; London et al., 2017; Xie & Kim, 2022) suggesting the relationship between avoidance-coping (e.g., behavioral disengagement and denial) and PTG. Because avoidant coping consolidates and maintains an assumptive worldview of the self, others, and the world in response to adversities, it may facilitate PTG's illusory aspect to mitigate the distress resulting from the challenging event (London et al., 2017; Xie & Kim, 2022; Zoellner & Maercker, 2006) and may prevent the development of its constructive aspect (Kalaitzaki, Tsouvelas et al., 2022). Nonetheless, the concurrent use of denial with positive reframing and religious coping may be an indication of real PTG. Qualitative research could have provided more information.

A number of other coping strategies uniquely facilitated certain PTG domains, separately for community residents and HCWs. In addition to the "silver triad", *Relating to others* was associated with the use of Instrumental Support among both groups and also with the use of emotional support for community residents. Seeking both instrumental and emotional support potentially strengthened and deepened community residents' close relationships with others. In agreement with the theoretical model of Tedeschi and Calhoun (2004) suggesting that PTG occurs as a result of individual characteristics (e.g., personality) and cognitive processes (e.g., coping strategies) in relation with external factors (e.g., social support), researchers have shown perceived social support and/or social support coping to positively correlate with PTG (Li et al., 2024; Mo et al., 2022; Xie & Kim, 2022) and with Relating to Others and Personal Growth in particular (Joy et al., 2023). Interestingly, Self-blame was associated with Relating to others for HCWs. Self-blame also contributed to HCWs' Personal Strength. It might be that attributing blame to themselves and holding responsibility for their actions (e.g., appropriate safety measures) in their effort to protect themselves and their loved ones, helped them reconsider their ability to control unprecedented situations thus strengthening themselves, and they also appreciated relating to others. This assumption needs further research. This being said, we certainly do not

suggest an increase in Self-blame, which may result in multiple negative ramifications, but we do acknowledge that, once present, it could have some beneficial outcomes.

New possibilities were recognized with the use of Active Coping and Instrumental Support by both groups and also with the use of the "golden dyad" for community residents and the "silver triad" for HCWs. It might be reasonable to assume that Active Coping and Instrumental Support are intercorrelated in the way that people who actively cope with the COVID-19 situation seek Instrumental Support among other actions to deal with the absurd. To put it another way, New Possibilities can be discovered through denying (HCWs) and positively reframing stressful reality, attempting to find ways to deal with it, and taking direct action, turning to internal resources (e.g., religious belief) and external support or resources (e.g., attending religious gatherings, meditating). The constellation of Active Coping, Instrumental Support, and Positive Reframing has also been found by Munroe et al. (2022) among young adults from Canada and the United States and Joy et al. (2023) found problem-focused coping to positively relate to all PTG domains.

For both community residents and HCWs, *Personal strength* was facilitated by the "golden dyad" and by the combination of Self-distraction and Active Coping. Community residents also used Behavioral Disengagement, whereas HCWs used denial and Self-blame. It was reasonable to expect active coping and Self-distraction (i.e., turning to something else) to enhance PTG. Paradoxically though, community residents also used Behavioral Disengagement (i.e., giving up) which is seemingly contradictory to Self–distraction. For HCWs, it worked as anticipated with less Behavioral Disengagement contributing to more PTG. Although it has been suggested that active, engagement coping yields better mental health outcomes than disengagement coping (i.e., avoiding a stressor or the associated emotions) (Carver et al., 1989), other researchers have proposed that distraction may well have a positive quality and can be an adaptive disengagement coping strategy in offering people the chance to *disengage* from and distract themselves from the stressor «by thinking about or engaging in activities that induce positive emotion» (Waugh et al., 2020). Another assumption would be that, should avoidance (e.g., disengagement, denial) coping subside to problem-focused strategies over time among community residents may indicate a gradual shift from illusory to constructive PTG (London et al., 2017).

Besides the "silver triad" for both groups, *Spiritual change* was promoted by the use of Active Coping by HCWs. In other words, Spiritual change was obtained by denying painful reality and trying to see it in a positive light, turning to inner resources (e.g., seeking, recognizing, and/or strengthening religious faith), and actively focusing efforts on doing something about the situation (in this case, it could be purposeful actions related to religion such as praying or meditating or any other). Interestingly, no study has yet examined the association of active coping with the domain of PTG Spiritual change. Based on the present findings, taking an active role after a challenging experience may play a pivotal role in terms of being able to have a broadened understanding of spiritual and existential growth.

For both groups, *Appreciation of life* increased with the use of the "silver triad", and the use of Active Coping. Community residents also used Self-distraction and Instrumental Support, whereas HCWs used emotional support. Distracting their attention to things that elicited positive emotions potentially was a catalyst for community residents to appreciate life. Rephrasing, the Appreciation of life was accomplished through the process of denying stressful reality, turning to inner resources (e.g., religious faith), diverting attention to positive things and/or positively reframing those that were not positive, and appreciating practical help received. Potentially the emotional help/comfort and understanding received by HCWs helped them appreciate life because it likely came from colleagues, which wasn't anticipated.

Some limitations in this work should be acknowledged. This was a repeated cross-sectional survey that does not allow us to know how many participants were the same between the two assessments. A longitudinal study with assessments before and during the crisis would have offered more valid results since we have no

way to know either the coping strategies or the PTG level before the survey and how they evolved. It is quite likely that the convenience samples of predominantly women, well-educated, and young participants were not representative of either the community residents or the HCWs, and thus the findings may not be generalizable. It is noteworthy that the online format of the self-report questionnaire may have been associated with selection and social desirability bias. The type and number of coping strategies may be related to age and education among other demographic variables. Besides the personal features, such as coping strategies, situational ones (e.g., specific features of the stressor/trauma) may be important in defining the pertinent strategies, and research should examine these.

Despite its limitations, this study expands current knowledge about the coping strategies that promote PTG among Greek HCWs and community residents to deal with the unprecedented COVID-19 challenges. Besides the coping strategies of positive reframing and religion that were beneficial beyond any doubt to facilitate all PTG domains for both groups, the named "golden dyad", HCWs and community residents resorted to slightly different ways to develop PTG; HCWs' potentially unique challenges they faced as a result of their professional role may have contributed to diversified results. Another notable finding was that it was rather the combination of various strategies than individual ones that promoted PTG domains. Notwithstanding that researchers have identified latent coping profiles or clusters of coping strategies (e.g., two by Nagy & Balázs, 2023; three in the Slovenian general population by Kavčič et al., 2022; five in the German general population by Kenntemich et al., 2022) associated with different outcomes (e.g., psychological functioning, well-being) only one attempt so far has examined their association with PTG during COVID-19 (Kalaitzaki et al., 2024), but it was in nurses. The identification of these compilations of coping strategies for each PTG domain can guide preventive training programs targeting specific coping strategies that need to be enhanced in each sampling group. For example, Cognitive Behavioral Therapy interventions, in which the core ingredient is positive reframing, could enhance people's chances of developing all PTG domains. Strengthening of spirituality, which may be considered the intrinsic component of Religion, can offer people meaningful interpretations of the absurd and inner peace; meditation and mindful practices can be helpful adjuncts. To people practicing religion extrinsically (e.g., praying and attending religious services), to the extent that this is helpful, it should be facilitated. Besides, the enhancement of specific coping strategies that were found to promote specific PTG domains can be proved particularly useful. The contribution of seemingly maladaptive coping strategies should be used appropriately to reveal their positive elements (e.g., when dealing is overwhelming, denial may allow people to process trauma at their own ease and time). Notwithstanding the strengthening of certain strategies, weakening others should be also considered in the training programs. For example, Substance Use as a coping needs to be replaced by other ways to deal with stressful reality.

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ΨΥΧΟΛΟΓΙΑ | PSYCHOLOGY, 29(2), 389-407

Ελληνική Ψυχολογική Εταιρεία
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ΕΜΠΕΙΡΙΚΗ ΕΡΓΑΣΙΑ | RESEARCH PAPER

Ένας μοναδικός συνδυασμός στρατηγικών αντιμετώπισης προωθεί κάθε τομέα Μετατραυματικής Ανάπτυξης στον COVID-19: Διαφορές μεταξύ γενικού πληθυσμού και επαγγελματιών υγείας

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ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ

Μετατραυματική ανάπτυξη
Στρατηγικές αντιμετώπισης
Γενικός πληθισμός
Επαγγελματίες υγείας
COVID-19
Πανδημία
Κορονοϊός

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ΠΕΡΙΛΗΨΗ

Ενώ ο COVID-19 έχει αναμφισβήτητα αρνητικές συνέπειες, ένα ποσοστό ανθρώπων έχει βιώσει θετικά αποτελέσματα, την μετατραυματική ανάπτυξη (ΜΑ). Η μελέτη συνέκρινε τα επίπεδα ΜΑ μεταξύ του γενικού πληθυσμού και των επαγγελματιών υγείας σε δύο χρονικά σημεία (Χ1 και Χ2) και εξέτασε τις στρατηγικές αντιμετώπισης που προωθούν κάθε τομέα ΜΑ. Ένα διαδικτυακό ερωτηματολόγιο χορηγήθηκε σε 2.437 ερωτηθέντες (499 και 253 επαγγελματίες υγείας και 1157 και 528 από τον γενικό πληθυσμό, στο Χ1 και Χ2, αντίστοιχα). Το Post-Traumatic Growth Inventory αξιολόγησε τους πέντε τομείς ΜΑ και το Brief COPE τις στρατηγικές αντιμετώπισης. Ελέγχοντας το φύλο, την ηλικία και την εκπαίδευση, η ANCOVA έδειξε ότι, παρόλο που οι επαγγελματίες υγείας είχαν χαμηλότερες βαθμολογίες στη ΜΑ σε σύγκριση με τον γενικό πληθυσμό στο Χ1, στο Χ2 είχαν σημαντικά υψηλότερες βαθμολογίες. Οι στρατηγικές αντιμετώπισης της θετικής αναπλαισίωσης και της θρησκείας προέβλεψαν θετικά όλους τους τομείς ΜΑ και στις δύο ομάδες. Η άρνηση ήταν η τρίτη πιο συχνά χρησιμοποιούμενη στρατηγική, ακολουθούμενη από την ενεργητική αντιμετώπιση. Ορισμένες στρατηγικές ήταν μοναδικοί προγνωστικοί παράγοντες συγκεκριμένων τομέων ΜΑ ή δειγμάτων. Η αυτοδιάσπαση της προσοχής προέβλεψε την Προσωπική Δύναμη στο γενικό πληθυσμό (επίσης τη Συμπεριφορική Αποδέσμευση) και την Εκτίμηση της ζωής, η Συναισθηματική Υποστήριξη προέβλεψε τις Σχέσεις του γενικού πληθυσμού με τους άλλους και την Εκτίμηση της Ζωής στους επαγγελματίες και η αυτομομφή προέβλεψε τις Σχέσεις των επαγγελματιών με τους άλλους και την Προσωπική Δύναμη. Ο προσδιορισμός συγκεκριμένων συνδυασμών για κάθε τομέα ΜΑ μπορεί να καθοδηγήσει προγράμματα προληπτικής εκπαίδευσης στις στρατηγικές που πρέπει να βελτιωθούν σε κάθε ομάδα.

https://doi.org/10.12681/psy_hps.39621

Ψυχολογία: Το περιοδικό της Ελληνικής Ψυχολογικής Εταιρείας
https://ejournals.epublishing.ekt.gr/index.php/psychology