Research Article

Anger management during the COVID-19 lockdown: The role of resilience and family support

Athanasios Tselebis, Dionisios Bratis, Aikaterini Roubi, Maria Anagnostopoulou, Konstantinos Giotakis, Argiro Pachi

Abstract

Background: Rapidly emerging evidence indicates a deterioration of mental health during the COVID-19 pandemic. The strict measures of lockdown have resulted in millions of people, worldwide, confined to their homes presenting with a broad range of negative emotions. Anger has emerged as a forceful and challenging emotion to experience and manage. Individual resilience and family support modify the response of a person in adverse circumstances by reducing the aggression in individuals and preventing anger derailing into aggressive behaviour.
Aim: To investigate the relationship between anger, aggression, resilience and family support in a general and healthcare population sample during the COVID-19 pandemic.
Methods: An online cross-sectional study was conducted during the Greek lockdown (April 2020). 378 participants (247 healthcare workers and 131 individuals from the general population) completed the following self-report mental health
Measures: The Dimensions of Anger Reactions-5 (DAR-5), the Brief Aggression Questionnaire (BAQ), the Brief Resilience Scale (BRS) and the Family Support Scale (FSS). Individual and demographic data were recorded.
Results: The study included 68 men and 310 women (mean age 41.37±9.83). The mean total score on the BAQ was 23.22 ± 6.7, on the BRS 21.35±4.97, on the DAR-5 9.75±3.43 and on the FSS 49.74±8.65. Male participants evidenced higher scores on BAQ, FSS and BRS scales compared with females (24.45±5.4 versus 22.95±6.94, p<0.05, 51.72±6.6 versus 49.32±8.9, p<0.01, 22.39±4.8 versus 21.11±4.9, p<0.05). Healthcare workers displayed higher scores on the DAR-5 scale (10.1±3.33 versus 9.08±3.5, p<0.01) compared with participants from the general population. Female healthcare workers scored higher on the DAR-5 scale (10.3±3.5 versus 9.42±2.52, p<0.05) compared with their male counterparts.

Also, healthcare staff working in COVID departments exhibited higher scores on the DAR-5 scale (10.96±3.04 versus 9.83±3.38, p<0.05) compared with staff from non-COVID departments. 28.57% of participants scored above cut-off on the DAR-5 scale. Positive correlations were evidenced between BRS and FSS scores (p<0.001) and negative between BRS and BAQ scores (p<0.001). Scores on DAR-5 correlated positively with BAQ scores (p<0.001) and negatively with FSS (p<0.001) and BRS scores (p<0.001). BRS scores correlated positively with age (p<0.05). The regression models revealed that 'scores on DAR-5', 'scores on BRS' and 'scores on FSS' were all significant predictors of 'scores on BAQ', each explaining 13.7%, 5.6% and 1.4% of the variance. To answer the research questions we investigated the role of resilience and family support performing a serial mediation analysis using PROCESS. The outcome variable for the analysis was BAQ. The predictor variable for the analysis was DAR-5. The mediator variables for the analysis were BRS and FSS. The total indirect effect of BRS and FSS on BAQ was found to be statistically significant [(B=0.18, 95% C.I. (0.0984, 0.2891)].
Conclusion: Resilience and family support, as mediators, appear to intervene and mitigate the maladaptive anger and aggression and should be taken into account in anger management interventions.

Psychiatric Department, "Sotiria" General Hospital of Chest Diseases, Athens, Greece

*Corresponding author:
Argyro Pachi
«Sotiria» General Hospital for Chest Diseases
Mesogeion 152, 11527, Athens, Greece
Email: psychiatrikisot@yahoo.gr

1. Introduction

On March 22, 2020, the Greek authorities announced restrictions on all non-essential movement throughout the country to control the spread of the COVID-19 virus. Restrictions were extended until 4 May. The measures put in place in Greece were among the most proactive and strictest in Europe and initially have been credited internationally for having slowed the spread of the disease and having kept the number of deaths among the lowest in Europe (1,2).

Unfortunately, these measures resulted in substantial changes in the daily lives of individuals across the country. Prolonged social isolation and the severe restrictions to travel and normal work and recreational activities have led to short-term as well as long-term psychosocial and mental health implications. Symptoms of stress, confusion and anger

predominate due to frustrating experiences (3). Scientific evidence suggests gender differences in mental health, with rising female vulnerability to depression and increasing male aggression, possibly because the pandemic-related stressors affect gender roles differentially (4). In this context of adversity, family ties can provide support to help cope with the situation and reduce the likelihood of developing psychological difficulties (5,6).

During the pandemic lockdown family members including children were spending a lot of time together at home where vulnerable children and young people are at risk to be exposed to some form of neglect, violence, or exploitation when families need attention to cope with job losses, economic insecurity, socially isolated, and behavior/ mental health difficulty (7). A study shows that child abuse has occurred more frequently during school holidays, summer breaks, and natural disaster (8). Parents and caregivers were also at increased risk of stress, job loss, and schedule changes (8). As a consequence the family may face additional risks impacting family resilience and causing a disruptive effect on the family relationship (9).

Differently, the COVID-19 pandemic may have positive influences for the family such as more quality time which can be spend together with all family members. Family functions are related to wellbeing during a serious disruption condition such as disaster (10) and access to parental support is important to mitigate the negative impact of COVID-19 to family resilience. Research suggests that parenthood is significantly associated with higher levels of resilience, pointing to the crucial contribution of a healthy workfamily balance to the healthcare providers' psychological well-being during this pandemic. Indeed, being a parent could lead to overall well-being, a more positive emotional experience and meaning from one moment to the next (11).

Meanwhile, symptoms of anger and irritability have been described in around a third of health workers surveyed in the United Kingdom (UK) during the COVID-19 pandemic (12). Anger is a social/moral emotion which can arise as a consequence of experiencing real or perceived harm but can also be a manifestation of anxiety, depression or post-traumatic stress disorder (PTSD). Either associated with fear about the risk of nosocomial transmission of the disease and/or moral distress felt by staff in relation to their inability to provide optimal care for patients and families (13), the fact remains that in an emergency, such as a global pandemic, high rates of fatigue and burnout were found in Greek healthcare staff, along with increased levels of perceived stress, insomnia and depression, primarily affecting the female gender (14,15).

The upheavals induced by the pandemic have highlighted the importance of resilience. Resilience refers to the capacity to cope with stress and recover from adversity and resilient individuals may not exhibit emotional or psychological problems despite exposure to adversity (16). The literature emphasizes how, in emergencies, many people are able to make use of internal resources which allow them to maintain mental health (17). The complexity and pervasiveness of the effects of the COVID-19 pandemic has the potential to undermine individuals' natural abilities to respond in a resilient fashion (18). Consistent results evidence resilience as

an important factor associated with reduced stress and distress during this COVID-19 crisis and inversely correlated with burnout among physicians (19).

The emotional experience of anger does not always lead to an aggressive course of action. Sadly, studies evidence that lockdowns were associated with elevated levels of aggression (20). Different forms of aggression have long been described referred to as instrumental (or proactive) aggression and hostile (or reactive) aggression. Instrumental/proactive aggression involves a relatively non-emotional display of aggressive behavior that is directed toward obtaining some goal. Hostile/reactive aggression, on the other hand, involves aggressive behavior that takes place within the context of associated anger and high emotionality. Hostile aggression has been labeled by Berkowitz as "emotional aggression", often occurring in conjunction with anger and in response to the experience of negative affect. Relatively unstable emotional conditions can trigger aggression, and if individuals can manage their emotions, they can reduce the risk of maladaptive behavior, including aggressive behavior (21). Studies suggest a direct relation between anger management and aggressive behavior and highlight the importance of family and healthy social circle on the mental health of an individual, apart from effective psychotherapeutic treatments regarding good coping strategies and social skills training (22).

The relationship between anger and resilience during COVID-19 pandemic has already been investigated and results indicate that potential resiliency factors are capable of reducing mental-health problems and feelings of anger during this difficult period (23). Also, novel approaches to enhancing resilience have been described which specifically address the issue of managing anger (24).

Research studies indicate a significant negative correlation between aggression and individual resilience and support that self control has a positive impact on reducing the aggression (25,26). Accordingly, scientific evidence suggests that one way of reducing the aggression in individuals is the enhancement of the level of resilience as a supportive mechanism that modifies the response of a person in risky positions (27).

The theoretical framework for our study was that individual resilience and family support have the ability to modify the response of a person in adverse circumstances by reducing the aggression in individuals and preventing anger derailing into aggressive behaviour. Accordingly, the aim of the study was to investigate the relationship between anger, aggression, resilience and family support in a general and healthcare population sample during the COVID-19 pandemic and consequently provide support for the aforementioned concept.

2. Subjects and Methods

2.1. Research Design

This was a descriptive correlational study. Anonymous self-

report questionnaires were used to record the data. The study applied an online survey method for data collection. The first page of the electronic questionnaire clearly stated that the completion and submission of the questionnaire was considered a statement of consent. Participation in the research was voluntary. Participants of the study were people from the general and healthcare population who responded to the emails. The study was conducted during the Greek lockdown (April 2020).

2.2. Measurement Tools

Demographic and social data from study participants included age, gender, and marital status were recorded. Healthcare personnel stated if they worked in a COVID or non-COVID department.

2.3. Dimensions of Anger Reactions-5 (DAR-5)

The Dimensions of Anger Reactions-5 (DAR-5) is a 5-item scale that measures anger experience over the past 4 weeks. Respondents rate their anger experience on a 5-point scale ranging from 1 ('None or almost none of the time') to 5 ('All or almost all of the time'). The five scores are summed, with a total DAR-5 score ranging from 5 to 25. Higher scores indicate more severe anger experiences. The original English scale showed excellent internal validity (Cronbach's α .86 – .91) and was found to capture a single factor of anger experience constituted by five anger reactions (i.e. frequency, intensity, duration, interpersonal aggressiveness, and interference with interpersonal relationships). A screening cut-off point of 12 on the DAR-5 successfully differentiated high and low scorers (28). The DAR-5 was translated to Greek in accordance with Hambleton, Merenda, and Spielberger (2004) rules for transcultural validation of psychometric instruments (29). The scale was first translated into Greek (by a native Greek bilingual expert) and then back-translated into English (by a native English bilingual expert). In a second round, experts were asked to check the conformity of the two English versions and to revise the Greek version accordingly. All divergences were solved by discussion and amendments were reached by consensus. Cronbach's alpha in this study was 0.762.

2.4. Brief Aggression Questionnaire

The Brief Aggression Questionnaire (BAQ) is a 12 item self-report measure of trait aggression. The questionnaire asks participants to rate on a scale from 1 (strongly agree) to 5 (strongly disagree), the degree to which statements describing behaviors and emotions, are characteristic of themselves. The AQ measures aggression in the domains of physical aggression, verbal aggression, anger, and hostility. The questionnaire was translated and back translated, from English to Greek and vice versa, by three bilingual translators (30). BAQ has been proposed as a valid and reliable instrument (Webster et al., 2014), with adequate temporal stability and convergent validity with other behavioural measures of aggression (31). Cronbach's alpha in this study was 0.761.

2.5. Brief Resilience Scale (BRS)

The Brief Resilience Scale (BRS) (32) is a 6-item measure of resilience, focusing on the ability to recover from stress and adversity. Responses are rated on a 5-point Likert scale from Strongly Disagree (1) to Strongly Agree (5). The higher the mean BRS score the more resilient the respondent is. BRS is a single factor scale. Half of the items are reversed scored to avoid social desirability response bias (Cronbach, 1950). Smith et al. (2008) reported Cronbach's alpha from .80 - .91 over four samples. BRS was translated in Greek by Stalikas & Kyriazos (2017) with the translation/back-translation method (33). Items 2, 4, 6 were reversed in all analyses, as proposed by Smith et al. (2008) to avoid desirability response bias (Cronbach, 1950). Responses varying from 1-5 for all six items give a range from 6-30. Total sum should be divided by the total number of questions answered. Scores between 1.00 and 2.99 correspond to low resilience, between 3.00 and 4.30 to normal and between 4.31 and 5.00 to high resilience. Cronbach's alpha in this study was 0.856.

2.6. Family Support Scale (FSS)

To evaluate perception of family support we used the family support scale (34) which aims to record the sense of support that a subject receives from the members of his/her family (with whom he/she lives). The scale consists of 13 items, which are answered on a Likert scale, ranging from 1 ("I disagree a lot") to 5 ("I agree a lot"). The scale is self-administered and all of the items focus on the interrelations of individuals that live together. High scores correspond to an increased sense of family support. Individuals that live alone did not complete the scale. Cronbach's alpha in this study was 0.788.

2.7. Statistical Analysis

Descriptive statistics were computed for all variables in the analysis. Independent-samples t-tests assessed for gender differences and differences between healthcare workers and those from the general population. The internal consistency reliability of the DAR-5, BAQ, BRS and, FSS in our sample was evaluated using Cronbach's alpha coefficient (≥0.70). The Shapiro–Wilk test was used to assess normality of data. Pearson Correlation was performed to determine the strength and direction of the relationship between variables. Linear regression models were built to investigate whether related variables were significant predictors of aggression. To answer the research questions we investigated the role of resilience and family support performing a serial mediation analysis using PROCESS. The outcome variable for the analysis was BAQ. The predictor variable for the analysis was DAR-5. The mediator variables for the analysis were BRS and FSS. Statistical significance was set at $p < 0.05$ (two-tailed) and analyses were performed using IBM SPSS Statistics 23 (IBM SPSS Statistics for Windows, Version 23.0). Mediation analyses were conducted using the Hayes SPSS Process Macro. IBM SPSS AMOS 23 Graphics was utilized to construct Figures 1 and 2.

3. Results

The study included 378 participants (68 men and 310 women with a mean age of 41.37±9.83). 247 of them were healthcare workers and 131 were individuals from the general population. The mean total score on the BAQ was 23.22 ± 6.7, on the BRS 3.55±0.828, on the DAR-5 9.75±3.43 and on the FSS 49.74±8.65. 28.57% of participants scored above cut-off on the DAR-5 scale. 21.42% of participants were classified as low resilient individuals, 57.67% as normal and 20.9% as high resilient.

Male participants evidenced higher scores on BAQ, FSS and BRS scales compared with females (24.45±5.4 versus 22.95±6.94, p<0.05, 51.72±6.6 versus 49.32±8.9, p<0.05, 3.73±0.8 versus 3.52±0.82, p<0.05) (Table 1). Healthcare workers displayed higher scores on the DAR-5 scale (10.1±3.33 versus 9.08±3.5, p<0.01) compared with participants from the general population. Female healthcare workers scored higher on the DAR-5 scale (10.3±3.5 versus 9.42±2.52, p<0.05) compared with their male counterparts. Also, healthcare staff working in COVID departments exhibited higher scores on the DAR-5 scale (10.96±3.04 versus 9.83±3.38, p<0.05) compared with staff from non-COVID departments (Table 2).

Table 1. General characteristics of participants and BAQ, DAR-5, BRS & FSS scores with regards to gender

P	D. S.	Age	BAQ	DAR-5	BRS	FSS
Men N = 68	Mean	41.99	24.45 *	9.29	3.73*	51.72*
	SD	9.21	5.41	2.69	0.8	6.63
Women N= 310	Mean	41.24	22.95 *	9.85	3.52*	49.32*
	SD	9.97	6.94	3.57	0.82	8.97
Total N = 378	Mean	41.37	23.22	9.75	3.55	49.74
	SD	9.83	6.7	3.43	0.828	8.65

Notes: * independent t-test p<0.05; ** independent t-test p<0.01.
Abbreviations: P, Participants; D.S., Descriptive Statistics.

Table 2. General characteristics of HCW and BAQ, DAR-5, BRS & FSS scores compared with GP

P	D. S.	Age	BAQ	DAR-5	BRS	FSS
HCW N = 247	Mean	41.69	23.50	10.10*	3.6	50.16
	SD	9.43	6.91	3.33	0.8	8.24
COVID N =60	Mean	39.55*	24.93	10.96*	3.51	50.00
	SD	9.91	6.57	3.04	0.8	7.01
Non-COVID N =187	Mean	42.38*	23.04	9.83*	3.64	50.21
	SD	9.52	6.97	3.38	0.8	8.62
GP N= 131	Mean	40.76	22.70	9.08*	3.46	48.88
	SD	10.55	6.29	3.54	0.87	9.41

Notes: * independent t-test p<0.05; ** independent t-test p<0.01.
Abbreviations: P, Participants; D.S., Descriptive Statistics; HCW, Healthcare workers; GP, General population.

Positive correlations were evidenced between BRS and FSS scores (p<0.001) and negative between BRS and BAQ scores (p<0.001). Scores on DAR-5 correlated positively with BAQ scores (p<0.001) and negatively with FSS (p<0.001) and BRS scores (p<0.001). BRS scores correlated positively with age (p<0.05) (Table 3).

Table 3. Correlations among age, BAQ, DAR-5, BRS & FSS.

Pearson Correlation N = 378		AGE	BAQ	DAR-5	BRS
BAQ	r	-0.096			
	p	0.063			
DAR-5	r	0.016	0.397**		
	p	0.754	0.000		
BRS	r	0.112*	-0.334**	−0.287 **	
	p	0.03	0.000	0.000	
FSS	r	-0.005	-0.271**	-0.263 **	0.328 **
	p	0.920	0.000	0.000	0.000

Notes: * p<0.05 or ** p<0.01.

The regression models revealed that 'scores on DAR-5', 'scores on BRS' and 'scores on FSS' were all significant predictors of 'scores on BAQ', each explaining 13.7%, 5.6% and 1.4% of the variance (Table 4).

Table 4. Stepwise multiple regression (only statistically significant variables are included).

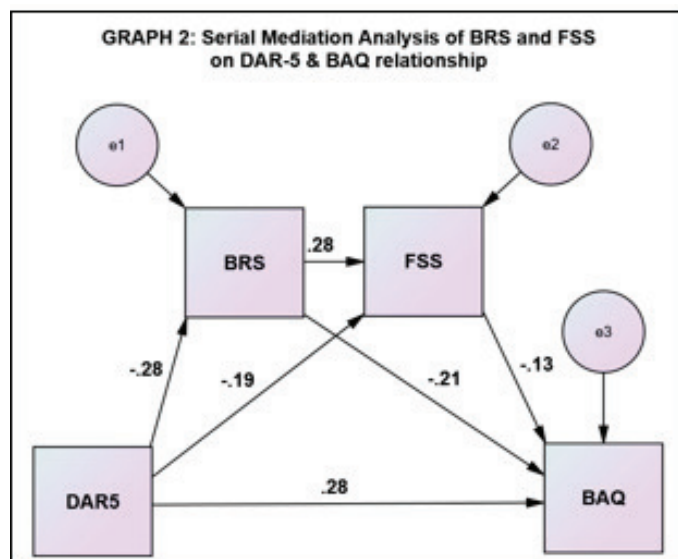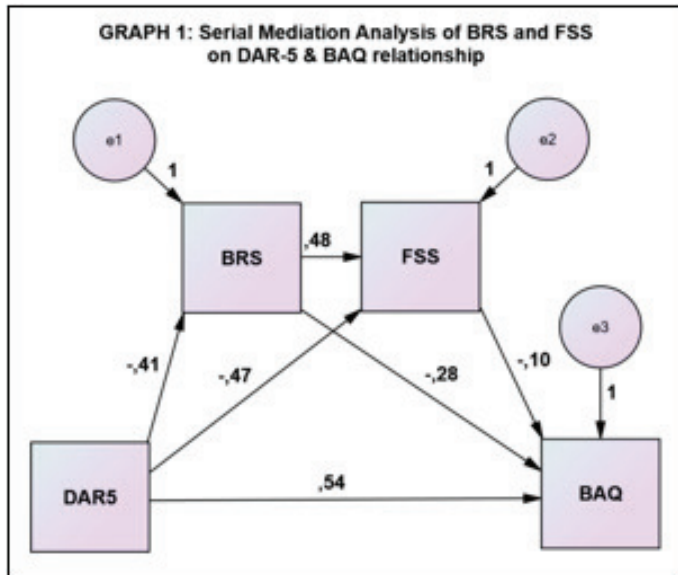| Dependent Variable: BAQ	R Square	R Square Change	Beta	t	p
DAR-5	0.137	0.137	0.277	5.461	0.000 **
BRS	0.93	0.056	−0.212	−4.085	0.000 **
FSS	0.207	0.014	-0.129	-2.491	0.013*

Notes: Beta = standardized regression coefficient; correlations are statistically significant at the * * p<0.05 or ** p<0.01 level.

To answer the research questions we investigated the role of resilience and family support performing a serial mediation analysis using PROCESS. The outcome variable for the analysis was BAQ. The predictor variable for the analysis was DAR-5. The mediator variables for the analysis were BRS and FSS. The total indirect effect of BRS and FSS on BAQ was found to be statistically significant [(B=0.18, 95% C.I. (0.0942, 0.2834)]. Unstandardized coefficients (b) for the variables are depicted in Graph 1. Standardized coefficients (beta) for the variables are depicted in Graph 2.

Table 5. Serial Mediation Analysis of BRS and FSS on DAR-5 & BAQ relationship.

Variable	b	SE	t	p	95% Confidence Interval	
					LLCI	ULCI
DAR-5 -> BRS	−0.4059	0.0752	−5.3967	0.0000	−0.5538	−0.2579
DAR-5 -> BAQ	0.5383	0.0986	5.4609	0.0000	0.3444	0.7321
BRS-> BAQ	−0.2816	0.0689	−4.0854	0.0001	−0.4172	−0.1460
(1)DAR-5-> BRS -> BAQ	0.1143	0.0362			0.0505	0.1911
DAR-5-> FSS	−0.4689	0.1304	−3.5844	0.0004	−0.7254	−0.2123
BRS->FSS	0.4762	0.0893	5.3321	0.0000	0.3006	0.6519
(2)DAR-5-> FSS -> BAQ	0.0465	0.0218			0.0096	0.0938
FSS -> BAQ	−0.0992	0.0398	−2.4910	0.0132	−0.1776	−0.0209
(3)DAR-5-> BRS -> FSS-> BAQ	0.0192	0.0100			0.0037	0.0423
Effects						
Direct	0.5383	0.0986	5.4609	0.0000	0.3444	0.7321
*Total Indirect	0.1800	0.0476			0.0953	0.2792
Total	0.7182	0.0967	7.4243	0.0000	0.5280	0.9085

Notes: Ind1: (1)DAR-5-> BRS -> BAQ= DAR-5 -> BRS * BRS-> BAQ, Ind2: (2)DAR-5-> FSS -> BAQ= DAR-5-> FSS * FSS -> BAQ, Ind3: (3)DAR-5-> BRS -> FSS-> BAQ= DAR-5-> BRS * BRS -> FSS * FSS-> BAQ
* Total Indirect = Ind1+ Ind2+ Ind3, Based on 5000 bootstrap samples.

GRAPH 1: Serial Mediation Analysis of BRS and FSS on DAR-5 & BAQ relationship

GRAPH 2: Serial Mediation Analysis of BRS and FSS on DAR-5 & BAQ relationship

4. Discussion

The present study highlighted the role of psychological resilience and family support in experience and expression of anger during the COVID-19 imposed lockdown. Gender differences were evidenced, due to COVID-19 pandemic burden, with increasing levels of male aggression. Concurrently, male participants exhibited higher psychological resilience and enjoyed a higher sense of family support, counteracting their aggressive tendencies.

From the genetic, hormonal, and environmental perspectives, gender may contribute to resilience (35). Research reports that females may manifest greater fear of and difficulty in addressing the stressors encountered compared with males as the cognitive styles of males and females are different, which can potentially impact their resilience (36). Also, studies state that family - social support has been shown to offset the negative effects of anger by encouraging health-promoting behaviors and that perceived family - social support positive correlated significantly with lower anger scores (37,38).

According to results from our study a significant percentage of participants admitted experiencing psychological distress as a result of their anger. Literature suggests that an increasing number of negative life events are strongly linked with increased levels of anger (39). Meanwhile, research has shown that individuals who are exposed to stressful situations, including the COVID-19 pandemic and the restrictions that were imposed in attempts to control that pandemic, tend to be especially vulnerable to developing mental-health problems and anger (40,41). COVID-19-related stressors stimulate cognitive, emotional, and physiological reactions that are associated with threat, and thus trigger fight-or-flight tendencies that lead to a higher level of anger and reactive physical aggression (42,43).

Elevated anger scores were primarily evident among healthcare workers, mostly in females. In general, women report more mental-health problems and feelings of anger than men do and this has held true during the COVID-19 pandemic (44,45). In previous studies it has been noted that there is no difference in the amount of anger experienced or expressed due to gender, while other studies have found that females reported higher levels of internal anger expression and males possess higher levels of anger in other areas, specifically outward anger and angry reaction (46,47). This is also reflected in how men and women respond to anger; men tend to externalize their aggressive feelings more, while women may respond to provocation with more anxiety and fear (47). More recent scientific approaches claim gender-specific types of aggression with men being directly aggressive and women indirectly (48). Indirect forms of aggression are psychologically not less harmful, but physical aggression and crime on average present higher societal costs and escalate more often into extreme forms requiring hospital admission, psychological treatment, restorative justice, imprisonment. Besides, about 80% of all global homicides are perpetrated by men (49).

Healthcare staff working in COVID departments exhibited elevated anger scores compared with staff from non-

COVID departments. Frontline healthcare workers, as first responders during the pandemic, experience tremendous and persistent stress which has the potential to result in excessive anger and poses elevated risk for PTSD that includes anger as a possible symptom. Notably, anger is sometimes symptomatic of depressive, anxiety, and substance use disorders, each of which is prevalent in first responder populations (50).

Healthcare workers are frequently exposed to environmental stressors such as excessive workload, shortage of staff, shift work, death and uncertainty about death and insufficient emotional preparation for the care and treatment of terminally ill patients, conflicts between coworkers, hostility and communication gaps, that may all be reasons for the emergence of anger as an important predictor of burnout (51). Previous research states that the prevalence of fatigue was higher in nurses caring for patients with COVID-19 than in those caring for patients with other diseases and levels of burnout and fatigue were higher among female healthcare workers compared to males (14). According to Fitzgerald et al. (2003), the extent to which one experiences job satisfaction impacts one's vulnerability to anger (52). Also, unjust treatment within interpersonal relationships, such as stress arising from conflicts with supervisors (i.e., role boundary), has the potential to lead to an anger response due to perceived environmental provocation (52).

Healthcare professionals are at a greater risk than any others to develop symptoms of psychological problems including anxiety, panic, or other stress-related disorders (53). Occupational stress results from a multitude of adverse employment conditions and can lead to maladaptive anger, which negatively impacts personal well-being and work performance. Aside from being a symptom of a broader disorder, anger may too function independently as a maladaptive coping strategy for first responders. For instance, Burke (1998) found that in a sample of police officers, expressing anger may serve as "escapist coping" in the face of occupational stress (54). Anger resulting from occupational stress also presents repercussions for interactions with the public, which is particularly problematic for those working as public service personnel. During the pandemic the mental health of the healthcare personnel has a decisive effect on the quality of health services and can affect the relationship of public trust in the healthcare system; a factor particularly important in ending the pandemic.

Thus, it is important to identify factors that might counteract anger and suggest approaches for anger management. Resilience appears to be one such factor and proposed anger management interventions focus on protective resources to support psychological resilience. Besides, resilience is a process and not just a stable trait throughout life, which justifies efforts to improve and strengthen psychological resilience through anger management psychoeducation programs (24). Resilience to demanding working conditions is associated with lower state and trait anger (55). Even after disasters most people are resilient and do not develop long lasting mental disorders. Consistent scientific results indicate that resilience was an important factor associated with fewer mental-health symptoms and lower levels of anger during this COVID-19 crisis (24, 56-58).

Literature reports that healthcare personnel working in COVID-19 departments do not have sufficient anger management skills and experience negative feelings such as anger, pain, emotional exhaustion and insensitivity (59). For those who live with family members the social interaction within the family may have supported them against the negative effects of stress. Family functions are related to well-being during a serious disruption condition such as disaster. Research emphasizes the role of social - family support in moderating the negative effects of life stress (60), but indicates that the effectiveness of such support depends on many factors (61). These include the type and amount of support provided, as well as the context surrounding the support transaction and the recipient's satisfaction with the support. Gender seems to affect support relationships in important ways and on average men tend to view spousal support more positively than do women (62).

During lockdown social isolation reduced the traditional avenues of social support giving rise to the concept of family resilience which refers to the capacity of the family, as a functional system, to withstand and rebound from adversity (63). Parents have a major role to build the family resilience at times of large scale public health crisis, especially during lockdown conditions when they suddenly became the only point of reference for their children. Child or adolescent resiliency is influenced by their parent's resiliency such as how well the parents take care of themselves and their family (64). Positive adapting among parents during the pandemic can produce a good adaptation in children (65). Families with greater parental support and perceived control have had less perceived stress during COVID-19 (66). As reported by Leary and Hoyle (2009), psychological distress upsets the ability to self-regulate (67) but regulatory emotional self-efficacy is crucial in the self-regulation of relationships and behavior (68). According to Bandura (1997), psychological distress, such as lack of social support or parental depression, can affect parenting self-efficacy, which is the belief that parents have to be able to manage their parental tasks successfully and that it is, in turn, related to children's adjustment (69). Developmental theories of aggression and prevention strategies indicate the significance of warm parenting against very early manifestations of anger and aggressiveness (70).

Finally, several health experts and scientists have observed increasing rates of family violence during the COVID-19 pandemic, particularly in situations of more stringent quarantines (20, 71,72). Recent meta-analysis found strong evidence for a moderate increase in domestic violence as a result of the pandemic and concluded that the risk of violence was more than double in households in quarantine, compared with households not in quarantine (73). With regard to crime rates, evidence shows an overall decline in almost all types of crime during lockdowns, with exception to homicides and cyber crime, suggesting a shift of violence from the streets into the homes (74). Emerging data appear to support that containment measures fueled behavioral expression of aggression in the form of violent acts during pandemic-related stay-at-home restrictions (75). Thus, considering the reality of uncontrollable negative life events, the creation of interventions at the individual and family level that augment coping mechanisms and resilience is important.

5. Conclusions

The Greek lockdown during April 2020 was associated with increased feelings of anger. Mediation analysis highlighted psychological resilience and family support as factors influencing the experience and expression of anger. Psychological interventions at the individual and family level are necessary to be implemented to address the problem and avoid long-term consequences.

Limitations

The current research was carried out during the COVID-19 pandemic lockdown. The sampling technique we used to collect data was an online survey and we have to consider the possibility of selection bias, as suggested by the unbalanced gender ratio observed, which influences the study's generalizability. Also, the self-report data were subject to common methods biases. Finally, the study was cross-sectional. Therefore, causality between the study's variables cannot be determined.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. «Daily Telegraph: Παράδειγμα προς μίμηση η ψύχραιμη συμπεριφορά των Ελλήνων | Kathimerini». www.kathimerini.gr. Ανακτήθηκε στις 26 Μαρτίου 2020.

2. ↑ Follow, Rebecca Hall. «Here in Greece we've adopted the Blitz spirit now lacking in Britain». The Telegraph (στα Αγγλικά). Ανακτήθηκε στις 26 Μαρτίου 2020.

3. Γλαμπεδάκης Μ. & συν. Το Ψυχολογικό Αποτύπωμα της COVID-19 στην Ελλάδα. Πανεπιστήμιο Δυτικής Αττικής. Αθήνα Νοέμβριος 2021

4. Abreu L, Koebach A, Díaz O, Carleial S, Hoeffler A, Stojetz W, Freudenreich H, Justino P and Brück T (2021) Life With Corona: Increased Gender Differences in Aggression and Depression Symptoms Due to the COVID-19 Pandemic Burden in Germany. Front. Psychol. 12:689396.

5. Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L & Ford, T. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. The Lancet Psychiatry, 7(6), 547-560.

6. Masten, A. S. (2018). Resilience theory and research on children and families: Past, present, and promise. Journal of Family Theory & Review, 10(1), 12-31.

7. Raman, S., Harries, M., Nathawad, R., Kyeremateng, R., Seth, R., & Lonne, B. (2020). Where do we go from here? A child rights-based response to COVID-19. BMJ Paediatrics Open, 4(1), 3–6.

8. Rosenthal, C. M., & Thompson, L. A. (2020). Child abuse awareness month during the coronavirus disease 2019 pandemic. JAMA Pediatrics, 174(8), 812.

9. Luttik, M. L. A., Mahrer-Imhof, R., García-Vivar, C., Brødsgaard, A., Dieperink, K. B., Imhof, L., Østergaard, B., Svavarsdottir, E. K., & Konradsen, H. (2020). The COVID-19 pandemic : A family affair. Journal of Family Nursing, 26(2), 87–89.

10. Masten, A. S., & Motti-Stefanidi, F. (2020). Multisystem resilience for children and youth in disaster: Reflections in the context of COVID-19. Adversity and Resilience Science, 1, 95–106.

11. D Douillet, A Caillaud, Jeremie Riou, P Miroux, E Thibaud, et al.. Assessment of physicians' resilience level during the COVID-19 pandemic. Translational Psychiatry, Nature Pub. Group, 2021, 11 (1), pp.283.

12. You Gov link https://yougov.co.uk/topics/economy/articles-reports/2020/06/16/ key-workers-struggling-stress-anxiety-and-sleeping

13. Colville G, Stewart C. Keep calm and carry on: Anger management on the intensive care unit. Intensive Crit Care Nurs. 2021 Feb;62:102979.

14. Sikaras, C.; Ilias, I.; Tselebis, A.; Pachi, A.; Zyga, S.; Tsironi, M.; Rojas, Gil.A.; Panagiotou, A. Nursing staff fatigue and burnout during the COVID-19 pandemic in Greece. AIMS Public Health 2022, 9 (1): 94-105.

15. Tselebis, A.; Lekka, D.; Sikaras, C.; Tsomaka, E.; Tassopoulos, A.; Ilias, I.; Bratis, D.; Pachi A. Insomnia, Perceived Stress, and Family Support among Nursing Staff during the Pandemic Crisis. Healthcare (Basel). 2020, 26; 8 (4): 434.

16. Stevenson, A. D., Phillips, C. B., & Anderson, K. J. (2011). Resilience among doctors who work in challenging areas: a qualitative study. British Journal of General Practice, 61(588), e404–e410.

17. Bonanno, G. A. (2004). Loss, trauma, and human resilience. American Psychologist, 59, 20–28.

18. Fiorillo, A., & Gorwood, P. (2020). The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. European Psychiatry, 63, e32.

19. Meynaar, I. A., Ottens, T., Zegers, M., van Mol, M. M. C. & van der Horst, I. C. C. Burnout, resilience and work engagement among Dutch intensivists in the aftermath of the COVID-19 crisis: a nationwide survey. J. Crit. Care 62, 1–5 (2021).

20. Killgore WDS, Cloonan SA, Taylor EC, Anlap I, Dailey NS. Increasing aggression during the COVID-19 lockdowns. J Affect Disord Rep. 2021 Jul;5:100163.

21. Scarpa A, Raine A. Psychophysiology of anger and violent behavior. Psychiatr Clin North Am. 1997 Jun;20(2):375-94.

22. Singh, Ankit and Sharma, Namita and Sahay, Somesh Kumar and Meshram, Anju, Effect of Anger and Anger Management Skills during the COVID-19 Pandemic: A Survey (October 14, 2021). Asian Journal of Applied Science and Technology (AJAST) 2021.

23. Braun-Lewensohn O, Abu-Kaf S, Kalagy T. What factors explain anger and mental health during the COVID-19 pandemic? The case of Israeli society. World J Psychiatry. 2021 Oct 19;11(10):864-875.

24. N. Turan, An investigation of the effects of an anger management psychoeducation programme on psychological resilience and affect of intensive care nurses, Intensive & Critical Care Nursing, https://doi.org/10.1016/j.iccn.2020.102915

25. Arslan G. Psychological maltreatment, emotional and behavioral problems in adolescents: The mediating role of resilience and self-esteem. Child Abuse Neglect. 2016;52:200–9.

26. Denson TF, DeWall CN, Finkel EJ. Self-control and aggression. Curr Dir Psychol Sci. 2012;21:20–5.

27. Sadeghifard YZ, Veisani Y, Mohamadian F, Azizifar A, Naghipour S, Aibod S. Relationship between aggression and individual resilience with the mediating role of spirituality in academic students - A path analysis. J Educ Health Promot. 2020;9:2. Published 2020 Jan 30.

28. Hambleton, R.K., Merenda, P.F., & Spielberger, C.D. (Eds.). (2004). Adapting Educational and Psychological Tests for Cross-Cultural Assessment (1st ed.). Psychology Press.

29. Forbes D, Alkemade N, Mitchell D, et al. Utility of the Dimensions of Anger Reactions–5 (dar-5) scale as a brief anger measure. Depression and Anxiety 31:166– 173 (2014).

30. Pachi A., Giotakis K., Fanouraki E., Vouraki G., Bratis D., Tselebis A. Adaptation of the Brief Aggression Questionnaire (BAQ) in Greek population. ENCEPHALOS. 2021;58:6–23.

31. Webster GD, DeWall CN, Pond Jr. RS, et al. The Brief Aggression Questionnaire: Psychometric and Behavioral Evidence for an Efficient Measure of Trait Aggression. AGGRESSIVE BEHAVIOR 2014;Volume 40, pages 120–139.

32. Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. International journal of behavioral medicine, 15(3), 194-200.

33. Kyriazos, T. A., Stalikas, A., Prassa, K., Galanakis, M., Yotsidi, V., & Lakioti, A. (2018). Psychometric Evidence of the Brief Resilience Scale (BRS) and Modeling Distinctiveness of Resilience from Depression and Stress. Psychology, 9, 1828-1857.

34. Tselebis, A., Anagnostopoulou, T., Bratis, D. et al. The 13 item Family Support Scale: Reliability and validity of the Greek translation in a sample of Greek health care professionals. Asia Pac Fam Med 10, 3 (2011).

35. Szanton SL, Gill JM. Facilitating resilience using a society-to-cells framework: a theory of nursing essentials applied to research and practice. ANS Adv Nurs Sci. 2010;33(4):329–343.

36. Hodes GE, Epperson CN. Sex differences in vulnerability and resilience to stress across the life span. Biol Psychiatry. 2019;86 (6):421–432.

37. Puskar K, Ren D, Bernardo LM, Haley T, Stark KH. Anger correlated with psychosocial variables in rural youth. Issues Compr Pediatr Nurs. 2008 Apr-Jun;31(2):71-87.

38. Tusaie K, Puskar K, Sereika S. A predictive and moderating model of psychosocial resilience in adolescents. Journal of Nursing Scholarship 2007;39:54–60.

39. Puskar K, Lamb J, Bonneysteele G, Sereika S, Rohay J, Tusaie-Mumford K. High touch meets high tech: Distance mental health screening for rural youth using Teleform. Computers in Nursing 1996a; 14:323–329.

40. Smith LE, Duffy B, Moxham-Hall V, Strang L, Wessely S, Rubin GJ. Anger and confrontation during the COVID-19 pandemic: a national cross-sectional survey in the UK. J R Soc Med. 2021 Feb;114(2):77-90.

41. Lei L, Huang X, Zhang S, Yang J, Yang L, Xu M. Comparison of prevalence and associated factors of anxiety and depression among people affected by vs people unaffected by quarantine during the COVID-19 epidemic in southwestern China. Med Sci Monit 2020; 26.

42. Allen, J. J., Anderson, C. A., and Bushman, B. J. (2018). The general aggression model. Curr. Opin. Psychol. 19, 75–80.

43. Elbert, T., Schauer, M., and Moran, J. K. (2018). Two pedals drive the bi-cycle of violence: Reactive and appetitive aggression. Curr. Opin. Psychol. 19, 135–138.

44. Liu N, Zhang F, Wei C, Jia Y, Shang Z, Sun L, Wu L, Sun Z, Zhou Y, Wang Y, Liu W. Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. Psychiatry Res 2020; 287.

45. Gómez-Salgado J, Domínguez-Salas S, RodríguezDomínguez C, et al. Gender perspective of psychological discomfort during COVID-19 confinement among Spanish adult population: a crosssectional study. BMJ Open 2021;11:e051572.

46. Deffenbacher, J. L., Oetting, E. R., Lynch, R. S., and Morris, C. D. (1996). The expression of anger and its consequences. Behav. Res. Ther. 34, 575–590.

47. Björkqvist, K. (2018). Gender differences in aggression. Curr. Opin. Psychol. 19, 39–42.

48. Denson TF, O'Dean SM, Blake KR, Beames JR. Aggression in

Women: Behavior, Brain and Hormones. Front Behav Neurosci. 2018;12:81. Published 2018 May 2.

49.   Global Study on Homicide (2019). Available online at: https://www.unodc.org/ unodc/en/data-and-analysis/global-study-on-homicide.html

50.   Doyle JN, Campbell MA, Gryshchuk L. Occupational Stress and Anger: Mediating Effects of Resiliency in First Responders. J Police Crim Psychol. 2021 Feb 4:1-10.

51.   Azoulay, E., Timsit, J.F., Sprung, C.L., Soares, M., Rusinova, K., et al., 2009. Prevalence and factors of intensive care unit conflicts: the conflicus study. Am. J. Respir. Crit. Care Med. 180, 853–860.

52.   Fitzgerald ST, Haythornthwaite JA, Suchday S, Ewart CK (2003) Anger in young Black and White workers: efects of job control, dissatisfaction, and support. J Behav Med 26(4):283–296.

53.   Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L, & Wang, J. (2020). Mental health care for medical staff in China during the COVID-19 outbreak. The Lancet Psychiatry, 7(4), e15-e16.

54.   Burke R (1998) Work and non-work stressors and well being among police ofcers: the role of coping. Anxiety Stress Coping 11:345– 362.

55.   Wilson SA, Tinker RH, Becker LA, Logan CR (2001) Stress management with law enforcement personnel: a controlled outcome study of EMDR versus a traditional stress management program. Int J Stress Manag 8:179–200.

56.   Yıldırım M, Arslan G, Özaslan A. Perceived Risk and Mental Health Problems among Healthcare Professionals during COVID-19 Pandemic: Exploring the Mediating Effects of Resilience and Coronavirus Fear. Int J Ment Health Addict. 2020 Nov 16:1-11.

57.   Xiao X, Xiao J, Yao J, Chen Y, Saligan L, Reynolds NR, Wang H. The Role of Resilience and Gender in Relation to Infectious-Disease-Specific Health Literacy and Anxiety During the COVID-19 Pandemic. Neuropsychiatr Dis Treat. 2020 Dec 8;16:3011-3021.

58.   Ju G, Lee J, Ahn MH, Lee J, Kim EJ, Suh S, Chung S. Effects of Depression and Resilience of Public Workers on Work-related Stress and Anxiety in Response to the COVID-19 Pandemic. J Korean Med Sci. 2021 Sep 13;36(36):e262.

59.   Costa, D.K., Moss, M., 2018. The cost of caring: emotion, burnout, and psychological distress in critical care clinicians. Ann. Am. Thorac. Soc. 15 (7), 787–790.

60.   Ozbay F, Johnson DC, Dimoulas E, Morgan CA, Charney D, Southwick S. Social support and resilience to stress: from neurobiology to clinical practice. Psychiatry (Edgmont). 2007;4(5):35-40.

61.   Zhang, H., Tang, L., Ye, Z. et al. The role of social support and emotional exhaustion in the association between work-family conflict and anxiety symptoms among female medical staff: a moderated mediation model. BMC Psychiatry 20, 266 (2020).

62.   Lynch SA. Who supports whom? How age and gender affect the perceived quality of support from family and friends. Gerontologist. 1998 Apr;38(2):231-8. doi: 10.1093/geront/38.2.231. PMID: 9573668.

63.   Froma Walsh, Family Resilience In: Multisystemic Resilience. Edited by: Michael Ungar, Oxford University Press (2021).

64.   Luthar, S. S., Ebbert, A. M., & Kumar, N. L. (2021). Risk and resilience during COVID-19 : A new study in the Zigler paradigm of developmental science. Development and Psychopathology, 33, 565–580.

65.   Morelli M, Cattelino E, Baiocco R, Trumello C, Babore A, Candelori C and Chirumbolo A (2020) Parents and Children During the COVID-19 Lockdown: The Influence of Parenting Distress and Parenting Self-Efficacy on Children's Emotional Well-Being. Front. Psychol. 11:584645

66.   Brown SM, Doom JR, Lechuga-Peña S, Watamura SE, Koppels T. Stress and parenting during the global COVID-19 pandemic. Child Abuse Negl. 2020;110(Pt 2):104699.

67.   Leary, M. R., and Hoyle, R. H. (eds) (2009). Handbook of Individual Differences in Social Behavior. New York, NY: The Guilford Press.

68.   Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., and Pastorelli, C. (2003). Role of affective self-regulatory efficacy on diverse spheres of psychosocial functioning. Child Dev. 74, 769–782.

69.   Jones, T. L., and Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: a review. Clin. Psychol. Rev. 25, 341–363.

70.   Perra O, Paine AL, Hay DF (2020). Continuity and change in anger and aggressiveness from infancy to childhood: The protective effects of positive parenting. Development and Psychopathology 1–20.

71.   Fraser, D. E. (2020). Impact of COVID-19 Pandemic on Violence against Women and Girls. 16. New York, NY: UN WOMEN.

72.   Elbert, T., Weierstall, R., and Schauer, M. (2010). Fascination violence: on mind and brain of man hunters. Eur. Arch. Psychiatry Clin. Neurosci. 260 Suppl 2, S100–S105.

73.   Ebert, C., and Steinert, J. I. (2021). Prevalence and risk factors of violence against women and children during COVID-19 Germany. Bull. World Health Organ. 99, 429–438.

74.   Scott, S. M., and Gross, L. J. (2021). COVID-19 and crime: analysis of crime dynamics amidst social distancing protocols. PLoS One 16:e0249414.

75.   Barchielli, B.; Baldi, M.; Paoli, E.; Roma, P.; Ferracuti, S.; Napoli, C.; Giannini, A.M.; Lausi, G. When "Stay at Home" Can Be Dangerous: Data on Domestic Violence in Italy during COVID-19 Lockdown. Int. J. Environ. Res. Public Health 2021, 18, 8948.