

# MENTAL HEALTH OF PSYCHIATRISTS AND PHYSICIANS OF OTHER SPECIALTIES IN EARLY COVID-19 PANDEMIC: RISK AND PROTECTIVE FACTORS

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## SUMMARY

**Background:** Many research has indicated that, during the COVID-19 pandemic, health care workers are under greatly increased pressure and at increased risk for the development of mental health problems. Furthermore, previous research has indicated that psychiatrists are exposed to a number of unique stressors that may increase their risk for poor mental health. The aims of the present study were to assess the level of COVID-19 related concerns, psychological distress and life satisfaction among psychiatrists and other physicians during the first period of the pandemic and to examine whether individual differences in COVID-19 concerns, psychological flexibility, psychological resilience and coping behaviors account for differences in mental health indicators.

**Subjects and methods:** The sample consisted of N=725 physicians, among whom 22.8% were psychiatrists. This study was conducted online during the first lockdown in Croatia and collected data regarding COVID-19 related concerns, coping behaviors and mental health indicators (Psychological Distress and Life Satisfaction).

**Results:** Physicians of other specialties had higher scores on a measure of COVID-19 anxiety than psychiatrists ( $p=0.012$ ). In addition, a number of differences in coping behaviors are evident. Specifically, psychiatrists were less likely than physicians of other specializations to believe that being informed about COVID-19 is an effective coping strategy ( $p=0.013$ ), but more prone to using sedatives and drugs as a coping strategy ( $p=0.002$ ;  $p=0.037$ ).

**Conclusions:** Psychiatrists are at special risk for substance abuse. Younger age, psychological inflexibility, low resilience and greater COVID-19 concerns might act as specific risk factors for distress. Our findings highlight the need for promoting a healthy lifestyle and psychological flexibility as universal protective factors.

**Key words:** COVID-19 - physicians - mental health

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## INTRODUCTION

Coronavirus (COVID-19) disease, caused by the severe acute respiratory coronavirus (SARS-CoV-2), was first recorded in the city of Wuhan in China in early December, 2019 and very rapidly spread globally. On March 11, 2020, the World Health Organization (WHO 2020) declared the COVID-19 pandemic and, two days later, proclaimed Europe as the center of the pandemic. In April, 2020, Italy, and later Spain, were the first countries in Europe to experience a rapidly spreading outbreak. Later, the focus of the epidemic became the United States and, by the middle of May, 2020, had shifted to Latin America.

In Croatia, the first patient with COVID-19 was diagnosed on February 25, 2020. Three weeks later, the first death due to the virus was recorded.

In addition to its' ability to spread rapidly, there are a number of unknowns related to this disease and the virus that causes it: what is the actual percentage of patients infected with the virus, why does the virus cause such differing clinical pictures and why does the number of deaths vary so much from country to coun-

try (Ioannidis et al. 2020). While work is in full swing on drug and vaccine development, epidemiological measures to prevent and control the spread of the disease are currently the only solution, from a biomedical perspective. These measures have included isolation, physical distancing, quarantine, use of protective equipment and the disinfection of persons, objects and premises. One goal of these measures was to flatten the growth curve and reduce the burden on the health system. However, these measures, which have so far proved relatively successful in controlling the pandemic, have significantly affected everyday life and have had immeasurable economic consequences (Ebrahim et al. 2020).

A broader biopsychosocial perspective (Engel 1977), which emphasizes the interrelationships between biological, psychological and social factors in the occurrence and presentation of disorders and diseases, indicates that it is necessary to care not only for physical health, but also for mental health and overall social well-being.

The COVID-19 pandemic is unique primarily in its global nature. This globality has not only been defined

by the spread of the virus itself but also an even faster spread of information that has enabled the preparation of both humans and systems even before the virus appeared in a given country. On the other hand, incoming information created a sense of danger and anticipation well before the onset of the disease itself. This situation induces an anxiety reaction that is either adaptive (i.e., has a motivating role in behavioral change) or maladaptive (worsening overall mental health and quality of life). COVID-19 has affected different frontiers of lives and induced many psychiatric individual (panic, anxiety, depression, post-traumatic stress disorders, suspiciousness) and collective problems (infodemia, cacophony, xenophobia, racism, etc.) (Jakovljević et al. 2020).

Despite current WHO recommendations (WHO 2020), the impact of this pandemic on mental health has continued to be neglected and there has not yet been an adequate response to these mental health consequences in many countries (Banerjee 2020).

The COVID-19 pandemic poses a specific health risk to members of numerous professions (Burdorf et al. 2020). Along with police officers, public servants and journalists, health care workers are under greatly increased pressure. Physicians and nurses are not only at increased risk of contracting the virus but are also a particularly vulnerable group for the development of mental disorders (Fiorillo & Gorwood 2020, Kontangelos et al. 2020). A recent meta-analysis demonstrated that, during the COVID-19 pandemic, symptoms of depression and anxiety were evident in 20% of health professionals, while sleep difficulties were present among 25% of this group. Research completed to date has also indicated that the main vulnerability factors are female gender and type of work, where nurses demonstrate the most symptoms (Pappa et al 2020). The presumption that the number of suicides among physicians would increase during pandemic (Montemurro et al. 2020) has also been confirmed (Goyal et al. 2020).

Healthcare professionals often do not seek or have access to systematic help for mental health problems (Xiang et al. 2020), instead relying on their own strengths and typically not seeking professional help (Schanafelt et al. 2020). Recent research with 657 American health care workers demonstrated that exercise was the most commonly used coping strategy (59%) and that access to an individual therapist with online self-guided counselling (33%) was of highest interest in this group (Shechter et al. 2020).

While much of the early scholarly work on COVID-19 has focused on intensive care, emergency care and primary care, previous infectious disease epidemics have demonstrated that the role of clinicians with specialty in mental health is important on multiple levels. Specifically, previous research has indicated that mental health professionals exhibited high levels of emotional exhaustion (O'Connor et al. 2018) and that psychiatrists are exposed to a number of unique

stressors that may increase the risk of poor mental health (Rotstein et al. 2019). Those working within the health system encountered numerous roles during the pandemic: patient care, advocacy, scholarship, staff support and system support/public health (Shalev 2020). Although we have yet not found any research comparing the psychological consequences of a pandemic among psychiatrists and other physicians, there have been a number of calls emphasizing the need for this type of research (Mitra & Kavoor 2020). On the whole, authors consider psychiatrists to be more vulnerable to experiencing stress and burnout than other physicians (Firth-Cozens 2007, Garcia et al. 2015, Heponiemi et al. 2014, Kumar 2007, 2011, Umene-Nakano et al. 2013) as a result of personality traits (Deary et al. 1996) or job risk factors (Kumar 2011). In a French study published just prior to the pandemic, psychiatrists were found to be less anxious than physicians of other specialties, while there was no difference in depression and burn-out (Hardy et al. 2020).

When researching the impact of a pandemic on mental health, it is necessary to consider the local epidemiological context. In Croatia, the first patient was diagnosed on February 25 and, at the time of writing this article (late September, 2020), around 16,200 cases had been recorded, of which 272 were fatal ([www.koronavirus.hr](http://www.koronavirus.hr)). Very strict measures were introduced early, which resulted in a flattening of the curve and relatively small patient numbers. While the health care system was at no point overburdened with COVID-19 patients, the price of these restrictive measures was a clear rise in anxiety, manifested in both the general population (Lauri Korajlija & Jokić-Begić 2020) and among Croatian doctors (Begić et al. 2020). The Among physicians, specific concerns related to COVID-19 disease, as well as concerns for the health system, were evident. Physicians also suffered more often from sleep disorders than the general population (Begić et al. 2020).

Earlier research has indicated psychological flexibility as a promising candidate for understanding and predicting how an individual may be affected by, and cope with, the acute and long-term challenges of the pandemic (Dawson & Golijani-Moghaddam 2020). Psychological flexibility is the ability to recognize and adapt to situational demands in pursuit of personally meaningful longer-term outcomes (Dawson & Golijani-Moghaddam 2020). Numerous studies have shown that psychological flexibility is associated with better quality of life and health outcomes (e.g. Dindo et al. 2017, Kashdan & Rottenberg 2010). In contrast, psychological inflexibility, which occurs as experience avoidance (an excessive tendency to avoid difficult experiences, thoughts, feelings and situations; (Hayes et al. 1996), and/or persistence in rigid and inflexible emotional, cognitive and behavioral patterns, has been found to be related to poorer coping and impaired

psychological and emotional health (e.g., Bardeen et al. 2013, Bonanno et al. 2004, Kashdan et al. 2006, Kashdan & Rottenberg 2010, Nielsen et al. 2016). Research has indicated that psychological inflexibility plays a significant role in predicting mental health problems as a result of the pandemic (Dawson et al. 2020, Landi et al. 2020)

A distinction should be made between psychological flexibility and coping strategies in a specific situation. Research demonstrates that psychological flexibility is a higher-order ability that allows the selection of an appropriate coping strategy in a particular situation and therefore contributes to mental balance (Dawson et al. 2020). Similarly, psychological flexibility contributes to stress resistance (Elliot et al. 2019). In a situation of extreme external changes such as that caused by a pandemic, it is to be expected that psychological flexibility will mitigate, and psychological inflexibility will exacerbate, the detrimental effects of COVID-19 on mental health.

The aims of the present study are: (I) to assess the level of COVID-19 related concerns, psychological distress and life satisfaction among psychiatrists and other physicians during the first period of the pandemic. Based on previous findings, we hypothesized that psychiatrists would demonstrate more pronounced COVID-19-related concerns, more pronounced distress, less adequate coping behaviors and lower life satisfaction during the COVID-19 pandemic as compared to other physicians; (II) to examine whether individual differences in COVID-19 concerns, psychological flexibility, psychological resilience and coping behaviors account for differences in mental health indicators. We hypothesized that higher COVID-19 concerns, lower psychological flexibility and lower resilience, as well as the use of inadequate coping strategies, would be predictors of more pronounced psychological distress

and lower subjective life satisfaction. Specifically, we investigated the robustness of the association between coping strategies used in the pandemic and mental health indicators, after controlling for COVID-19 concerns, psychological flexibility and resilience.

## SUBJECTS AND METHODS

### Participants

The sample in the present study consisted of N=725 physicians, most of whom were women (71.9%) aged between 26 and 81 years (M=48.3 SD=11.26). In the sample, 17.5% of physicians were residents and the remainder were specialists. Psychiatrists represented 22.8% of the physicians in the sample, while a further 37.4% were doctors of internal medicine specialties, 14.2% were doctors of surgical specializations and the remaining were distributed among various specialties: family physician (8.0%), anesthesiologists (5.7%), infectologists and epidemiologists (2.3%), emergency physicians (1.9%) and physicians of other specializations (7.4%).

Table 1 presents further demographic characteristics of the participants.

### Procedure

This study was conducted exclusively online during April, 2020. The invitation to participate in the research, which also contained a link to the questionnaire on the Survey Monkey platform, was sent to the professional societies of the Croatian Medical Association and the Croatian Psychiatric Society, along with a request to forward the invitation to their members.

The research was approved by the Ethics Committee of the Department of Psychology at the Faculty of Philosophy, University of Zagreb.

**Table 1.** Demographic characteristics of psychiatrists and physicians with other specializations

Variables	Physicians		Psychiatrists	
	M (SD)	N (%)	M (SD)	N (%)
Age				
Male	48.5 (11.55)	154 (27.5)	46.0 (10.57)	49 (29.9)
Female	48.5 (11.33)	407 (72.5)	48.2 (10.82)	115 (70.1)
All	48.5 (11.38)	561	47.5 (10.76)	164
Education				
Graduate		352 (62.7)		108 (65.9)
Postgraduate		209 (37.3)		56 (34.1)
Children				
Yes		411 (73.3)		114 (69.5)
No		150 (26.7)		50 (30.5)
Number of children				
One		115 (34.5)		33 (35.0)
Two		166 (49.8)		48 (51.1)
Three and more		52 (15.7)		13 (13.9)

\* Due to missing data, there are differing numbers of participants in some categories

## Instruments

Using the online questionnaire, data regarding COVID-19 related concerns, coping behaviors and mental health indicators was collected.

### *COVID-19 anxiety scale*

The ten-item COVID-19 anxiety scale (CAS) (Begić et al. 2020) was used to examine COVID-19 health concerns. This scale was modeled on the Swine Flu Care Scale (Wheaton et al. 2012) and measures concerns related to SARS-CoV-2 virus, perceived vulnerability (one's own as well as that of older and younger family members and acquaintances), perceived severity of infection, concerns related to mental health vulnerability related to pandemic and the perception of whether the virus is more serious than flu. For the purposes of this study, this scale also included a single item related to concerns about whether one's job was putting loved ones at higher health risk. Participants responded on a five-point Likert scale (1: 'not at all' to 5: 'very much'). A higher mean score indicates higher anxiety related to SARS-CoV-2 and COVID-19. Cronbach's alpha coefficient was  $\alpha=0.82$  and  $\alpha=0.78$  for the sample of psychiatrists and physicians, respectively.

### *COVID-19 pandemic concerns*

The COVID-19 pandemic concerns measure is an ten-item scale related to four types of concerns – economic concerns (three items: concerns related to the economic consequences of the pandemic for the country, for one's own economic status and for the economic status of close ones), social concerns (three items: family, partner and friends concerns), civil concerns (two items: concerns related to education and civil rights) and health system concerns (two items: concerns related to the health system in general and the quality of medical care during the pandemic) (Begić et al. 2020). Responses are made on a five-point Likert scale (1: 'not at all' to 5: very much'). For each subscale, a mean score ranging from 1 to 5 was computed. Cronbach's alpha coefficients are  $\alpha=0.73$  for both samples.

### *Coping behaviors*

In order to examine the behavior and thoughts participants use as coping strategies, participants were presented a list of 19 different individual strategies (e.g. reading books, working, humor, staying informed...). Using a 5-point Likert scale (1: 'not at all' to 5: 'a lot'), participants were asked to rate the extent to which each of the presented behaviors assists them in coping with the pandemic. In our analysis, individual behaviors were used as variables with the assumption that this would be more informative.

### *Clinical Outcome in Routine Evaluation-YP*

To measure psychological distress, the Clinical Outcome in Routine Evaluation-YP (CORE-YP) scale (Kozjak & Jokić-Begić 2013, Twigg et al. 2000) was

used. The CORE-YP is a ten-item self-report measure that includes items broadly relate to well-being, symptoms/problems, functioning and risk (to self). All items refer to respondents' experiences in the 7-day period prior to scale administration and apply a five-point response scale ranging from 'Not at all' (0) to 'Most or all of the time' (4). A total mean score is calculated. Cronbach's alpha reliability coefficients are  $\alpha=0.86$  and  $\alpha=0.87$  for psychiatrists and other physicians, respectively.

### *Acceptance and Action Questionnaire*

As a measure of psychological flexibility, The Acceptance and Action Questionnaire (AAQ-II, Bond et al. 2011) was used. As the most commonly used measure of psychological inflexibility and avoidance, the AAQ-II includes seven items to which participants respond on a seven-point scale. For the purposes of the present study, the items were reversed so that a higher total score, calculated as the sum of all items, indicates higher psychological flexibility. Cronbach's alpha reliability coefficients are  $\alpha=0.89$  and  $\alpha=0.91$  for psychiatrists and other physicians, respectively.

### *Brief Resilience Scale*

The Brief Resilience Scale (BRS, Smith Dalen et al. 2008) is a six-item scale created to measure the ability to bounce back or recover from stress. Each item is rated on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). In the present study, the items were reversed so that a higher total score, calculated as the sum of all items, indicates higher resilience. Cronbach's alpha coefficients were  $\alpha=0.82$  and  $\alpha=0.85$  for psychiatrists and other physicians, respectively.

### *Life satisfaction*

Life satisfaction was measured using a single item: "How satisfied are you with your life overall?". Participants responded on a scale ranging from 0 (completely dissatisfied) to 10 (completely satisfied) (Lauri Korajlija et al. 2019).

The questionnaire also included a number of questions in which various sociodemographic data (gender, age, parental and relationship status, level of education) and information on health status (presence of a chronic condition) was collected.

## Statistical analysis

All statistical analysis was conducted using the SPSS 20.0 software.

Descriptive data are presented using arithmetic means and standard deviations. Differences between groups of participants were examined using t-test, where a criterion of 5% significance was used for determining the significance of the observed differences.

Pearson correlation coefficients were used as an indicator of relationships between variables. Finally, a

4-step hierarchical regression analysis was used to determine which of the measured predictors are significant in explaining variance in psychological distress and life satisfaction.

## RESULTS

Descriptive data for all variables are presented in Table 2.

When differences between physicians and psychiatrists in COVID-19 concerns, psychological flexibility, resilience and mental health indicators were analyzed, only the difference in COVID-19 health concerns reached significance, where physicians demonstrated significantly higher levels of health concerns ( $p=0.012$ ) (Table 2).

Table 3 presents data on the frequency with which individual coping behaviors were used during the COVID-19 pandemic, where potential differences between physicians and psychiatrists were also examined.

Humor was the most frequently strategy used to cope with stress caused by the pandemic in both groups of physicians. For psychiatrists, the following most frequently used coping strategies were knowledge that they had done everything they could, sharing experiences with others and talking about other topics. In contrast, physicians of other specialties, after humor, most frequently relied on informing themselves about the pandemic in the belief that this helped them cope with stress. This was followed by strategies related to the knowledge that they had done everything they could and physical activity. A statistically significant difference

**Table 2.** Differences between physicians and psychiatrists in COVID-19 related concerns, psychological flexibility, resilience, and mental health indicators

Variables	Physicians M (SD)	Psychiatrist M (SD)	t	p
CAS – COVID-19 health concerns	36.0 (6.46)	34.4 (6.41)	2.51	0.012
COVID-19 – economic concerns	4.1 (0.77)	4.0 (0.69)	1.32	0.187
COVID-19 – social concerns	2.1 (1.12)	2.2 (1.14)	0.55	0.586
COVID-19 – civil concerns	3.3 (1.12)	3.4 (1.03)	0.37	0.712
COVID-19 – health system concerns	4.1 (0.95)	4.0 (0.95)	0.98	0.329
AAQ-II – psychological flexibility	21.2 (7.11)	20.5 (6.34)	0.75	0.453
BRS – resilience	39.1 (4.20)	38.7 (3.72)	1.51	0.131
CORE – psychological distress	1.3 (0.67)	1.3 (0.61)	0.13	0.894
SL – life satisfaction	7.7 (1.83)	7.5 (1.74)	1.27	0.203

**Table 3.** Frequency with which individual coping behaviors were used during the COVID-19 pandemic and differences between physicians and psychiatrists in strategy use

Variables	Physicians %*	Psychiatrist %	$\chi^2$	p
Staying informed	72.0	57.4	12.61	0.013
Physical activity	58.7	50.0	8.67	0.070
Sexual activity	25.9	21.2	5.54	0.236
Household jobs	38.1	33.1	3.70	0.448
Watching movies and TV series	36.4	42.3	6.48	0.166
Reading books	42.1	47.6	2.57	0.632
Talking about things other than pandemic	57.9	58.1	5.60	0.231
Exchanging experiences	55.7	58.1	1.24	0.871
Using alcohol	14.1	16.8	3.84	0.271
Smoking	6.5	9.2	6.94	0.134
Using drugs	0.2	0.7	17.49	0.002
Using sedatives	1.6	2.8	10.24	0.037
Religion	31.2	29.8	4.15	0.387
Believing that my significant others are safe	42.9	43.0	2.91	0.574
Volunteering	11.9	9.9	3.50	0.486
Working	50.5	43.0	8.64	0.071
Knowing that I did all that I could	64.6	62.5	3.53	0.473
Humor	76.6	77.0	0.43	0.980
Pets	37.5	32.6	2.17	0.705

\* Percentages represent the percent of participants who responded that they used these behaviors ‘a lot’ (4) or ‘most of the time’ (5)

between the two groups of physicians was obtained for three coping behaviors - the need to stay informed about coronavirus (more pronounced in non-psychiatrists;  $p=0.013$ ) and in the use of sedatives and drugs (more pronounced in psychiatrists;  $p=0.002$  and  $p=0.037$ , respectively). However, it should be noted that the vast majority of physicians (98.5% of physicians of other specialties and 93.6% of psychiatrists) reported never using drugs.

The second aim of this study was to examine whether individual differences in COVID-19 concerns, psychological flexibility, psychological resilience, and coping behaviors can account for differences in mental health indicators. Because there were no significant differences in mental health indicators among psychiatrists and other physicians, the following analyses were conducted on the whole sample. Table 4 presents zero-order correlations among psychological distress and life satisfaction and key predictor variables.

Psychological distress is correlated with female gender, younger age, lower psychological flexibility and resilience and more pronounced COVID-19 concerns. The same correlation pattern is evident for life satisfaction and other variables, except in the case of age and gender. Psychological distress is correlated with less frequent use of work, physical and sexual activity, reading books and humor as coping behaviors, and is also more pronounced with more frequent use of psychoactive substances such as alcohol, nicotine and drugs as coping behaviors. The notion that one has done all he/she could is associated with less psychological distress. Conversely, physical and sexual activity and religion was positively correlated with life satisfaction, while smoking and using drugs was negatively correlated with life satisfaction. In addition, there are weak but significant and positive correlations between humor and “knowing that I did all that I could” and life satisfaction.

**Table 4.** Correlations between mental health indicators and psychological flexibility, psychological resilience, and coping behaviors

Predictors	Mental health indicators	
	Psychological distress	Life satisfaction
Gender	-0.08*	-0.01
Age	-0.17**	0.10
Specialization	-0.02	0.06
AAQ-II–psychological flexibility	-0.62**	0.52**
BRS - resilience	-0.52**	0.35**
COVID-19 – economic concerns	0.23**	-0.17**
COVID-19 – social concerns	0.32**	-0.30**
COVID-19 – civil concerns	0.21**	-0.16**
COVID-19 – health system concerns	0.25**	-0.16**
CAS – COVID-19 health concerns	0.34**	-0.02
Staying informed	0.00	0.02
Physical activity	-0.11**	0.13**
Sexual activity	-0.14**	0.22**
Household jobs	-0.02	0.08
Watching movies and TV series	0.06	-0.02
Reading books	-0.10*	0.04
Talking about things other than pandemic	-0.03	0.05
Exchanging experiences	0.02	-0.03
Using alcohol	0.16**	-0.06
Smoking	0.10*	-0.19**
Using drugs	0.12**	-0.07
Using sedatives	0.28**	-0.19**
Religion	0.01	0.11**
Believing that my significant others are safe	-0.03	0.00
Volunteering	0.00	0.04
Working	-0.12**	0.06
Knowing that I did all that I could	-0.25**	0.08*
Humor	-0.17**	0.09*
Pets	0.00	-0.04

Note: \*  $p<0.05$ ; \*\*  $p<0.01$

**Table 5.** Hierarchical Multiple Regression Predicting Psychological distress in physicians

Variables	Step 1 β	Step 2 β	Step 3 β	Step 4 β
Gender <sup>a</sup>	-0.08*	-0.03	-0.02	-0.04
Age	-0.18**	-0.15**	-0.14**	-0.15**
Specialization <sup>b</sup>	0.03	0.01	0.01	0.01
AAQ-II – psychological flexibility		-0.47**	-0.43**	-0.37**
BRS – resilience		-0.26**	-0.19**	-0.17*
COVID-19 – economic concerns			0.02	0.02
COVID-19 – social concerns			0.11**	0.10**
COVID-19 – civil concerns			0.04	0.06
COVID-19 – health system concerns			0.02	0.01
CAS – COVID-19 health concerns			0.23**	0.14**
Physical activity				-0.06
Sexual activity				-0.04
Reading books				-0.01
Using alcohol				0.04
Smoking				0.03
Using drugs				-0.04
Using sedatives				0.11**
Working				0.05
Knowing that I did all that I could				-0.15**
Humor				-0.05
R <sup>2</sup>	0.04	0.47	0.53	0.57
ΔR <sup>2</sup>		0.43	0.06	0.05
F	7.79**	219.87**	12.85**	5.979**

Note: \* p<0.05; \*\* p<0.01; <sup>a</sup> – male is coded as 1; <sup>b</sup> – psychiatrist is coded as 1

**Table 6.** Hierarchical Multiple Regression Predicting Life Satisfaction among physicians

Variables	Step 1 β	Step 2 β	Step 3 β	Step 4 β
Gender <sup>a</sup>	0.04	-0.010	-0.01	-0.01
Age	0.10*	0.07	0.05	0.07
Specialization <sup>b</sup>	-0.03	-0.03	-0.02	0.01
AAQ-II – psychological flexibility		0.44**	0.41**	0.37**
BRS – resilience		0.11*	0.11**	0.09*
COVID-19 – economic concerns			-0.06	-0.07
COVID-19 – social concerns			-0.15**	-0.15**
COVID-19 – civil concerns			-0.03	-0.05
COVID-19 – health system concerns			0.01	0.01
CAS – COVID-19 health concerns			0.08*	0.08
Physical activity				0.05
Sexual activity				0.12*
Smoking				-0.09*
Using drugs				-0.01
Using sedatives				-0.05
Religion				0.10**
Believing that my significant others are safe				-0.02
Humor				-0.03
R <sup>2</sup>	0.01	0.28	0.31	0.35
ΔR <sup>2</sup>		0.26	0.03	0.04
F	2.19	99.77**	4.40**	5.52**

Note: \* p<0.05; \*\* p<0.01; <sup>a</sup> – male is coded as 1; <sup>b</sup> – psychiatrist is coded as 1

To examine predictors of mental health indicators (psychological distress and life satisfaction) among doctors, we performed two hierarchical regression analyses. In the first step, we controlled for gender, age and specialization (psychiatrists vs. other physicians). In the second step, we added psychological flexibility and resilience as relatively stable personality trait/cognitive style variables. In the third and fourth step, we added COVID-19 pandemic related variables: COVID-19 and other concerns and various behaviors and thoughts aimed at coping with the pandemic. The results of this hierarchical regression analysis are presented in Tables 5 and 6.

The results presented in Table 5 indicate that, using the selected predictors, we were able to explain 57% of the variance in psychological distress among physicians during the pandemic. Significant predictors are younger age, higher psychological inflexibility and lower resilience. COVID-19 health related concerns and concerns about how the pandemic will affect one's social relationships are also predictors of higher psychological distress. According to these results, relatively stable characteristics (psychological flexibility and resilience) were the best predictors of psychological distress during the COVID-19 pandemic. When coping behaviors were considered, using sedatives and a greater need for information were related to higher psychological distress, while a sense of control (expressed through the notion of 'knowing I did all that I could') was related to lower psychological distress above and beyond other coping behaviors.

The results presented in Table 6 indicate that, using the selected predictors, we were able to explain 35% of the variance in life satisfaction among physicians during the pandemic. Significant predictors were older age, higher psychological flexibility and resilience. When COVID-19 related concerns are considered, only lower social concerns are related to better life satisfaction. Among coping behaviors, sexual activity and religion were related to better quality of life, while smoking was related to lower life satisfaction above and beyond all other variables.

## DISCUSSION

Pandemic is certainly a distress-provoking situation for all populations, but perhaps especially so for health care workers. Previous research examining physicians' reactions to the COVID-19 pandemic has indicated intense stress reactions, insomnia, anxiety, depression and even suicidality (Galbraith et al. 2020, Spoorthy et al. 2020). However, these studies have not focused specifically on psychiatrists, despite existing research that has often highlighted the higher-than-expected rates of physical illnesses, psycho-social morbidities and completed suicide among psychiatrists (Firth-Cozens 2007), likely stemming from a lack of self-care (Mitra & Kavoor 2020).

## Comparison of psychiatrists with physicians with other specialists

The first aim of this study was to compare mental health indicators among psychiatrists and other physicians in an early stage of pandemic. No statistically significant differences were obtained in the degree of psychological stress and subjective life satisfaction between these groups. However, physicians of other specialties had higher scores on the measure of COVID-19 anxiety, which primarily refers to fear of personal illness or transmission of the disease to others. No difference was obtained between groups for the severity of concerns about the consequences of the pandemic, nor for psychological traits. However, some differences are evident when coping behaviors are examined. Specifically, psychiatrists were less likely than physicians of other specialization to believe that being informed about COVID-19 is an effective coping strategy, but more prone to use sedatives and drugs as a coping strategy. Although the overall rate of reported substance use is very low, these results are consistent with existing knowledge on substance abuse among psychiatrists (Trinkoff & Storr 1998). Psychiatry is a highly pharmacologically oriented discipline, which may establish a culture in which the psychotropic effects of drugs are frequently encountered and readily accepted. In such a culture, a stress situation may more readily evoke substance use for the purposes of self-medication. It is also possible that the acceptance of the use of pharmaceuticals for controlling psychiatric conditions makes psychiatrists more willing to report their own drug use than other specialty groups.

Both groups of physicians indicated that humor was the most helpful coping strategy in the pandemic situation. This is similarly reflected globally, as evident in the increased circulation of humorous messages during the COVID-19 pandemic (Amici 2020, Fessell 2020). Recent research conducted during the pandemic demonstrated that humor transmits positive emotions and is used to communicate cohesion and support and distance oneself from stress, thus allowing people to perceive events as less frightening (Amici 2020). Consistent with previous research, the results of the present study demonstrate that humor is associated with lower psychological distress and higher life satisfaction. Although humor as a coping strategy might help individuals to cognitively appraise a situation as less stressful, research also suggests that humor may be used as an avoidance strategy (Ramos et al. 2018).

Among physicians of other specialties, the second most commonly reported coping behavior was remaining informed about the coronavirus. Interestingly, among psychiatrists, this behavior appears much less frequently (fifth in the frequency rank). Previous research has indicated that being inundated with information is a mental health risk factor in a pandemic situation, while not reading news/updates about COVID-19 and a healthy diet were the best predictors



of lower anxiety (Fullana et al. 2020, Jokić-Begić et al. 2020). The results of this study indicate that staying informed is not correlated with psychological distress nor life satisfaction, despite the finding that physicians believed it to be helpful.

A useful coping strategy reported by both groups was achieving a sense of control (reflected by the item "knowing that I did all that I could"), which ranked second with psychiatrists and third with physicians of other specialties. This strategy was significantly associated with lower distress and discretely with higher life satisfaction. Consistent with previous research, physical activity, exchanging experiences and talking about things other than the pandemic were also often used as stress-reducing activities (Schechter 2020), although only physical activity/exercise was found to be associated with lower distress and higher life satisfaction. Sexual activity, work and reading books are also associated with lower distress, while the use of psychoactive substances (smoking, drugs, sedatives) is associated with higher distress and lower life satisfaction. Around 14% of physicians of other specialties and nearly 17% of psychiatrists indicated that alcohol helps them deal with pandemic stress, a significantly higher result than that found in other studies (Han et al. 2020, Khasne et al. 2020, Wu et al. 2008) but consistent with the trend of increased alcohol use observed during lockdown (Rodriguez et al. 2020). These findings might be understood as an early sign of a post-pandemic increase in the incidence of alcohol abuse among physicians. Engaging in faith-based religion, although a less commonly reported coping behavior, is positively correlated with life satisfaction but not distress, a finding also consistent with pre-pandemic findings (Berthold & Ruch 2014) and other recent research (Zacher & Rudolph 2020).

### **Psychological determinants of distress and life satisfaction**

The second aim of this research was to examine whether individual differences in age, gender, medical specialization (psychiatry or other specialization), COVID-19 concerns, psychological flexibility, psychological resilience and coping behaviors account for differences in mental health indicators. The results indicated that younger participants, those with prominent concerns about COVID-19, those concerned about the pandemic's consequences on social relationships and those with less psychological flexibility and less resilience have more pronounced distress than participants who were older and less fearful of the pandemic. The use of sedatives and a lower sense of control predict greater distress level beyond demographic and personal variables. Similar results are obtained when the criterion is life satisfaction, although this is a far more robust variable that is more determined by psychological traits than circumstances. Finally, being a psychiatrist does not have a significant predictive role in explaining the intensity of distress or life satisfaction.

The protective role of age in preserving mental health during the COVID-19 outbreak has been previously documented in recent research (Solomou & Constantinidou 2020, Xiong et al. 2020). One possible explanation for this result is that age provides opportunities to build resilience due to exposure to multiple and different stressors over time, resulting in better emotional management and lower distress. Furthermore, the younger participants in our sample typically hold an additional caregiving role within their own families (i.e., mostly women), providing financial and emotional support to children or the elderly.

Psychological inflexibility proved to be the most significant single risk factor for both distress and life satisfaction. Previous research suggests that the inability to control one's unpleasant feelings and unwanted thoughts is associated with more significant psychological agitation (Kroska et al. 2020) and generally lower psychological functioning when faced with life's difficulties (Plumb et al. 2004). As COVID-19 represents a global crisis that primarily relates to the health situation and thus mainly affects healthcare professionals, techniques that help cope with unwanted feelings and thoughts are crucial for preserving the mental health of physicians. The results of this study are consistent with those from a study by Arslan et al. (2020), which demonstrated that psychological flexibility has a mediation role in the association between stress associated with COVID-19 and psychological difficulties.

Psychological non-resilience is also a risk factor for distress and lower life satisfaction, albeit to a much lesser extent. When faced with a public health emergency, physicians with high resilience are less likely to develop negative emotional symptoms. Another recent study has similarly indicated that psychological resilience ensures a better state of mental health during the COVID-19 pandemic (Labrague & Ballad 2020, Ran et al. 2020).

The results of this study are consistent with previous research demonstrating the interplay between psychological distress and COVID-19 concerns, even after controlling for age, gender and psychological traits (Begić et al. 2020, Jokić-Begić et al. 2020, Kroska et al. 2020, Lauri Korajlija & Jokić-Begić 2020, Solomou & Constantinidou 2020). The intensity of COVID-19 concerns is associated with higher distress, which can be understood as a result of a globally present sense of uncertainty and fueled by a constant stream of information about the disastrous effects of the pandemic and the need to adhere to safety behaviors across all media outlets (Solomou & Constantinidou 2020, Taylor 2019). Indeed, in the current situation, fears regarding the COVID-19 pandemic should be viewed as expected consequences in an exceptional situation rather than pathologic reactions (Petzold et al. 2020).

Although COVID-19 concerns do not predict life satisfaction, concerns about the deterioration of social relationships due to the pandemic is a risk factor for distress and lower life satisfaction, even after control-

ling for psychological traits and demographic variables. In any stressful situation, social relationships are an essential source of support and concern about these relationships is one of the central concerns to arise as a consequence of the pandemic (Czymara et al. 2020).

Among all coping strategies, use of psychoactive substances was a main risk factor, even after controlling for demographic, psychological and actual concerns. Specifically, use of tranquilizers was predictive of more intense distress and smoking predicted lower life satisfaction. Although the correlational nature of this study does not allow any conclusion to be made regarding causality, these findings do highlight the need to emphasize the importance of a healthy lifestyle when communicating with the public, a notion similarly demonstrated by research in other countries (Heath et al. 2020, Petzold et al. 2020). Achieving a sense of control or having a sense that one did all that they could, is a predictor of lower distress above and beyond other personal characteristics. Interestingly, sexual activity and religiosity are independent predictors of life satisfaction, even after controlling for other variables. Higher life satisfaction among individuals engaged in sexual activities during pandemic and who perceive this as coping behavior is a finding consistent with previous research demonstrating that sexual health is a fundamental pillar of physical and mental well-being (Ballester-Arnal et al. 2020). Similarly, religion plays a significant role in predicting life satisfaction under stressful circumstances, a finding also evident in pandemic circumstances. Among the resources used to deal with major life events, religion and social support have been suggested to represent adaptive coping strategies (Imperator et al. 2020, Martínez et al. 2020).

### **Study Limitations, Implications, and Future Research**

A number of limitations to the present study make it necessary to use caution when interpreting the obtained results. Firstly, this study holds all limitations related to the use of an online data collection method, including the self-selection of participants, which undermines the external validity of the study and the interpretation of the findings. However, collecting data online has proven to be extremely useful during the pandemic, when it would otherwise be extremely difficult to reach a large number of participants. Previous research has concluded that such biases can distort point-estimates, such as average symptom level or prevalence, but not patterns of associations with putative risk factors (Heiervang & Goodman 2011).

Although the number of female physicians represented in this study is relatively large (71.3%) and 2018 data for Croatia indicate that 63.3% of employed doctors of medicine were women (HZJZ 2019), it is still not possible to generalize the results of this study to the entire population of physicians.

Another limitation of this study relates to the correlational nature of the research, which does not allow for causal conclusions to be drawn.

This research represents the first study to assess the risk and protective factors of psychological distress and life satisfaction among physicians in Croatia during the current COVID-19 pandemic. Recruitment of participants was initiated quite early in the pandemic, which meant that participants completed the questionnaire at a time when case numbers were rising exponentially, and media coverage was extensive. This allowed us to study psychological consequences at an early stage of the pandemic and provides a sound foundation from which to conduct further longitudinal follow-up research.

These results provide important information about the psychological determinants that impact distress and life satisfaction among physicians. In light of results suggesting that psychiatrists are vulnerable for substance abuse, preventive activities regarding the use of psychoactive substances should be directed specifically to this group. Furthermore, preventive mental health efforts should also be directed towards younger physicians, who were also shown to be at higher risk. At present, guidelines and approaches to pandemic management aim to limit the spread of infection while giving relatively little attention to psychological factors that influence the increase in psychological agitation in humans. As such, the findings from this study and similar research should be used to emphasize the importance of directly addressing mental health in times of pandemic. It is also important to examine the constructs that might serve as protective factors from the impact of the pandemic on mental health. One such construct is certainly psychological flexibility. Encouraging psychological flexibility among physicians might reduce the negative impacts of the pandemic on mental health. Findings in recent evaluations of preventive programs and treatment of mental disorders indicating that psychological flexibility can be improved in only a few meetings (Ruiz & Odriozola-Gonzalez 2016) significantly facilitates the exploitation of the benefits of exercising psychological flexibility. In addition, the results of the present study suggest a somewhat different pattern of predictors for minimizing the negative consequences of the pandemic than that for maintaining life satisfaction. The use of psychoactive substances is a universal risk factor and it is therefore necessary to direct preventive activities towards raising awareness of the adverse influence of nicotine, alcohol and tranquilizers. Knowledge that I have done everything I can contributes to reducing stress, independent of stable personality traits. Sexual activity and religious/spiritual activities as coping behaviors also contribute to life satisfaction in stressful circumstances, which also provides important information for directing psycho-educational activities towards physicians at risk for decreased mental health in a pandemic situation.

## CONCLUSION

The findings of the present study confirm that the pandemic and the implementation of the restrictive measures to prevent the spread of the coronavirus have had a large impact on psychological state and life satisfaction among physicians. Psychiatrists are at special risk for substance abuse. Younger age, psychological inflexibility, low resilience and greater COVID-19 concerns might act as specific risk factors for distress. Our findings highlight the need for promoting a healthy lifestyle and psychological flexibility as universal protective factors.

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### Contribution of individual authors:

Nataša Jokić-Begić - design of the study, literature searches and analyses, statistical analyses, interpretation of data, manuscript writing.

Anita Lauri Korajlija - design of the study, statistical analyses, interpretation of data, manuscript writing.

Dražen Begić - design of the study, literature searches and analyses, manuscript writing.

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