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Relations between mindfulness, perceived stress and psychopathological symptoms in healthcare professionals and control participants

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Abstract

The present study investigated the relations between dispositional mindfulness (MD), perceived stress and psychopathological symptoms in healthcare professionals (N = 104) and control participants (N = 125). Participants completed an online survey including the Mindful Attention Awareness Scale, the Perceived Stress Scale, and the Symptom Check List-90-R in the period between May and September 2021. The results revealed three main points. First, healthcare professionals reported lower levels of psychopathological symptoms and marginally higher levels of dispositional MD. Second, dispositional MD was negatively associated with both perceived stress and psychopathological symptoms. Third, group moderated the relation between dispositional MD and psychopathological symptoms, such that high levels of mindfulness reduced psychopathological symptoms in healthcare professionals, but not in control participants. Taken together, these findings suggest that the protective influence of dispositional MD on psychological wellbeing may be particularly pronounced in healthcare professionals.

Keywords: Healthcare professionals; Mindfulness; Perceived stress; Psychopathological symptoms.

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Introduction

According to Kabat-Zinn (1994), mindfulness (MD) can be defined as a basic attitude that results from paying attention on purpose and experiencing one's life in the present moment, in a non-judgmental way. Although the MD concept is rooted in the Buddhist philosophy, a growing body of research has documented the beneficial implications of this particular type of awareness for the improvement of subjective wellbeing in Western societies (Kabat-Zinn, 2003; see Tomlinson, Yousaf, Vittersø & Jones, 2018, for a review). The present study aimed at contributing to this field by examining the concurrent relations between dispositional MD, perceived stress and psychopathological symptoms in a sample of Italian healthcare workers and control participants.

Several studies documented the fact that healthcare professionals are particularly prone to exhibiting high levels of burnout, mental fatigue, and depression, because they are constantly exposed to emotional and interpersonal stressors (e.g., O'Connor, Neff, & Pitman, 2018). The ongoing pandemic has further exacerbated this situation, especially in those workers who have been directly in contact with COVID-19 patients (Barello, Palamenghi, & Graffigna, 2020; Giusti et al., 2020; Jalili, Niroomand, Hadavand, Zeinali, & Fotouhi, 2021; Ruiz-Fernández et al., 2020; Simione & Gnagnarella, 2020)¹. In this context, it is of utmost importance to determine whether dispositional MD has the potential to represent a protective factor for healthcare professionals, as well as for the general population (Conversano et al., 2020; Yuan, 2021; Zhu et al., 2021).

Dispositional MD can be conceived of as a multidimensional construct reflecting both the *focus* of attention (i.e., the tendency to maintain attention on immediate experiences and recognize mental events in the present moment) and the *quality* of attention (i.e., a specific orientation toward one's experiences in the present moment, characterized by curiosity, openness, and acceptance) (Bishop et al., 2004). A comprehensive review by Rau and Williams (2016) clarified that dispositional MD appears to exist independently from other forms of mindfulness, such as learned or cultivated mindfulness, and demonstrates significant associations with well-established personality traits, such as neuroticism and conscientiousness. Importantly, previous studies have been primarily focused on investigating the beneficial effects of cultivated MD on mental health. In this respect, short-term interventions such as mindfulness-based stress reduction (MBSR) have been found to improve the psychological wellbeing of healthcare professionals (Escuriex, & Labbe, 2011; Irving, Dobkin, & Park, 2009). The review by Kriakous, Elliott, Lamers and Owen (2020), for example, showed that MBSR programs were effective in reducing healthcare workers' experiences of anxiety, depression and stress. Another review specifically focused on nurses and nursing students concluded that mindfulness meditation decreased stress, anxiety, depression, and burnout, while simultaneously enhancing emotional wellbeing and empathy (van der Riet, Levett-Jones, & Aquino-Russell, 2018).

Turning to dispositional MD, which is the focus of the present study, there is evidence from non-clinical samples linking this attitude to lower levels of burnout and psychopathological

symptoms such as depression and anxiety (see Tomlinson et al., 2018, for a review). Similar findings have been reported in healthcare professionals, although the empirical evidence is still limited. Westphal et al. (2015), in particular, found that dispositional MD was a negative predictor of anxiety, depression and burnout in a sample of 50 emergency room nurses (see also Salvarani et al., 2019). Another study by Atanes et al. (2015) showed that dispositional MD was negatively associated with perceived stress and negative affect, but positively associated with positive affect, in a sample of 450 primary healthcare professionals. Lastly, Voci, Veneziani and Metta (2016) reported that dispositional MD was negatively associated with burnout in 98 Italian healthcare professionals.

In addition to having direct effects on mental health, dispositional MD can also moderate the relation between perceived stress and psychopathological symptoms (Tomlinson et al., 2018). For example, Bergin and Pakenham (2016) had a sample of 481 Australian law students completing an online questionnaire. The regression analyses indicated that perceived stress predicted depression and anxiety at both low and high levels of MD, but the associations were weaker at higher levels of MD. Thus, for participants having high levels of dispositional MD, the negative impact of perceived stress on depression and anxiety was less pronounced (compared to participants having low levels of dispositional MD). Similar findings have been previously reported by Bränström, Duncan, and Moskowitz (2011) in a random population-based sample of 1,000 Swedish individuals aged 18–60 years. Interestingly for the present purposes, there is preliminary data indicating that the moderating influence of dispositional MD might be extended to healthcare professionals.

Building on this evidence, in the present investigation we asked healthcare professionals ($N=104$) and control participants not working in the medical sector ($N=125$) to complete an online survey examining dispositional MD, perceived stress and psychopathological symptoms. When compared with previous results, our study has a number of innovative characteristics. In fact, we were not solely interested in replicating the negative associations of dispositional MD with perceived stress and psychopathological symptoms. We additionally evaluated 1) whether group moderated the relations between MD and PSS and between MD and psychopathological symptoms, and 2) whether MD moderated the relation between PSS and psychopathological symptoms. To our knowledge, the first two questions have not been previously assessed, whereas for the third question there is preliminary evidence indicating that, in a sample of 500 Chinese intensive care nurses, dispositional MD moderated the effects of perceived stress on emotional exhaustion (one of the aspects of the burnout syndrome), depression, anxiety, positive affect, and negative affect (Lu et al., 2019).

Our expectations were as follows. First, we expected that perceived stress and psychopathological symptoms should be higher in healthcare professionals than in control participants, due to the higher number of stressors experienced by the former group (O'Connor et al., 2018). Second, we expected that dispositional MD should be negatively associated with perceived stress and psychopathological symptoms and that these relations should be significantly stronger in healthcare

professionals than in control participants. Third, we predicted that MD should moderate the positive association between perceived stress and psychopathological symptoms (Bergin & Pakenham, 2016; Bränström et al., 2011; Lu et al., 2019).

Method

Participants

The required sample size was estimated a-priori on the basis of previous studies testing the associations between MD, PSS and psychopathological symptoms. In the study by Westphal et al. (2015), for example, the associations of MD with anxiety and depression were -0.55 and -0.49 , respectively. Likewise, the association between MD and perceived stress was -0.54 in the study by Atanes et al. (2015). The average correlation was therefore -0.52 . Using this value, we estimated with the software G*Power3 (Faul et al., 2007) that a sample size of 40 participants (per group) was sufficient to reach a power of 0.95 (one-tailed; $\alpha = 0.05$).

The final sample included a total of 229 participants, of which 125 were controls and 104 were healthcare professionals. They were recruited by word of mouth in a large hospital located in North Italy. Inclusion criteria for healthcare professionals were a) age higher than 18 years, b) working in the healthcare sector, and c) not having a psychiatric diagnosis. For controls, only the first and the third criteria were used. Overall, our participants were 163 females (71.2%) and 66 males (28.8%), with a mean age was 39.0 years ($SD = 13.0$). Educational levels were distributed as follows: 95 (4%) had a high-school diploma or less, 90 (39.3%) had a university degree, and 44 (19.2%) had a postgraduate degree (master or PhD). Marital status was 135 (59.0%) married or living together and 93 (40.6%) unmarried – one participant did not report this information. Mean length of service was 13.8 years ($SD = 12.2$; four participants did not report this information)².

Finally, 48 participants (20.9%) performed independent meditation exercises, whereas the remaining 181 participants (79.1%) were unfamiliar with these practices.

We performed a set of preliminary analyses (independent t -tests or χ^2 tests) to determine whether the two groups (health professional and controls) differed on demographic characteristics (see Table 1). The results showed that health professionals a) were slightly, but significantly, older than controls [$M = 41.0$ vs. $M = 36.7$ years: $t(227) = -2.58$, $p = 0.012$], b) had a higher length of service than controls [$M = 15.9$ vs. $M = 11.3$ years: $t(223) = -2.82$, $p = 0.005$], and c) were more educated than controls [$M = 17.2$ vs. $M = 14.7$ years: $t(187.28) = -6.18$, $p < 0.001$]. On the other hand, the two groups did not differ in terms of gender [$\chi^2(1) = 1.28$, $p = 0.26$], marital status [$\chi^2(1) = 0.27$, $p = 0.59$], and frequency of meditation practices [$\chi^2(1) = 0.04$, $p = 0.83$].

Regarding the composition of the two groups, health professionals were mostly represented by nurses ($N = 77$, 74.0%), followed by technicians ($N = 12$, 11.7%), physicians ($N = 9$, 8.7%) and independent specialists (e.g., physiotherapists: $N = 6$, 5.6%). For the control group, composition was heterogeneous, including university students, workers, employees, businessmen, teachers, engineers, magistrates and freelance professionals.

Instruments and measures

Mindfulness. Dispositional MD was measured with the Italian version of the *Mindful Attention Awareness Scale* (MAAS; Brown & Ryan, 2003; Veneziani & Voci, 2015). The MAAS is composed of 15 items formulated in an indirect way that assess the level of awareness and attention at the present time (e.g., “I rush through activities without being really attentive to them”). Each item is associated with a 7-point Likert scale, through which the compiler can express how often he/she experiences the situations described (from 1 = almost always to 7 = almost never). Following Veneziani and Voci (2015),

Tab. 1. Demographic properties and psychological variables for healthcare professionals and controls

	Professionals		Controls	
	M or fr	SD or %	M or fr	SD or %
<i>Sociodemographic Measures</i>				
Age (years)	41.03	11.78	36.74	14.00
Length of service (years)	15.90	11.91	11.36	12.15
Education (years)	17.29	2.44	14.78	3.53
Gender (N)				
Males	31	25.6%	35	32.4%
Females	90	74.4%	73	67.6%
Marital status (N)				
Single	47	39.2%	46	42.6%
Married or living together	73	60.8%	62	57.4%
Meditation practices (N)				
Yes	26	21.5%	22	20.4%
No	95	78.5%	86	79.6%
<i>Psychological measures</i>				
MAAS	4.88	1.11	4.47	1.27
PSS	10.15	6.91	19.98	9.11
GSI	0.80	0.34	0.92	0.37

Note: MAAS = Mindful Attention Awareness Scale; PSS = Perceived Stress Scale; GSI = Global Severity Index (Symptom Check List-90-R)

scores in the 15 items were summed and then divided by the total number of items, yielding a summary index that ranged between 1 and 7. Higher scores reflected more present-moment awareness states (i.e., higher levels of mindfulness). Cronbach's alpha in the present study was 0.88, which is in line with the internal reliability reported by Veneziani and Voci (2015; $\alpha = 0.84$, Study 2).

Perceived Stress. The Perceived Stress Scale (PSS) is a 10-item questionnaire which measures the degree "to which individuals evaluate situations in their lives as stressful and overloading" (Cohen, Kamarck, & Mermelstein, 1983; Italian adaptation by Mondo, Sechi, & Cabras, 2021). It includes six negatively stated items (e.g., "Unable to control the important things in your life") and four positively stated items (e.g., "Dealt successfully with day-to-day problems and annoyances"). Participants respond to each question on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they have been felt a certain way within the past month. A total score was computed after reversing positive items: thus, higher scores indicated higher levels of perceived stress. In the present study, Cronbach's alphas were 0.82.

Psychopathological symptoms. The Italian version of the Symptom Check List-90-R (SCL-90-R; Derogatis, 1994) is a widely used 90-item questionnaire aimed at measuring the self-reported severity of psychopathological symptoms (Prunas, Sarno, Preti, Madeddu, & Perugini, 2012). For each item, participants are asked to report the severity of the corresponding symptom over the previous seven days, using a 5-points Likert scale ranging from 0 (not at all) to 4 (very much). Specifically, the SCL-90-R has been designed to evaluate nine different symptomatic dimensions: Somatization (SOM), Obsessive-compulsive (O-C), Interpersonal sensitivity (I-S), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic anxiety (PHOB), Paranoid ideation (PAR) and Psychoticism (PSY). For the present purposes, we computed and used in the following analyses the *Global Severity Index* (GSI), which has been regarded as "the single best indicator of the current level or depth of an individual's disorder" (Prunas et al., 2012, p.591). This index combines information regarding both the number and the intensity of symptoms and is computed by adding the scores of all 90 items and dividing by 90. In our sample, Cronbach's alphas for the nine symptomatic dimensions were very good, ranging between 0.81 and 0.91.

Procedure

The questionnaire was prepared using Google Forms and disseminated through different social media or by hand (where possible). We used a snowball sampling strategy, meaning that participants were encouraged to share the link with colleagues, relatives, or friends. Health professionals were recruited from a large Hospital in Milan (Lombardy), which serves both Covid-19 and ordinary patients. Permissions to conduct the research was sought and granted from the Medical Direction of the Hospital. The study was carried out in accordance with the principles laid down in the Declaration of Helsinki and all respondents signed an online informed consent. Ethical approval was provided by LUMSA University (n.2/2023).

Data analysis

Statistical analyses were performed in three successive steps. First, to determine whether the two groups (health professionals vs. controls) differed in terms of dispositional MD, perceived stress and psychopathological symptoms, we ran a series of one-way between-subject ANCOVAs, considering age, education and length of service as covariates. Second, to examine the associations between dispositional MD, perceived stress and psychopathological symptoms, Pearson's correlations were computed, both for the whole sample and separately for healthcare professionals and controls. Third, to ascertain whether dispositional MD and perceived stress predicted psychopathological symptoms in the whole sample, whether group moderated the associations of dispositional MD and perceived stress with psychopathological symptoms, and whether MD moderated the association between perceived stress and psychopathological symptoms, we performed a hierarchical regression analysis. Demographic variables were included in the first step, to control for their potential influence (age, education and length of service were entered as continuous variables, whereas gender, marital status and the use of meditation practices were entered as dichotomous variables). Group, dispositional MD and PSS scores were entered in the second step, to estimate their unique contribution to the prediction of GSI scores. Lastly, the interactions between MD and group, between PSS and group, and between MD and PSS were entered in the third step (as recommended by Frazier, Tix, & Barron, 2004). All the continuous variables were standardized before entering the analysis.

Results

Table 1 reports descriptive statistics for dispositional MD, Perceived Stress and GSI scores in the whole sample and separately for healthcare professionals and controls. When considering all participants, asymmetry and kurtosis values were acceptable (i.e., comprised between +1.5 and -1.5; Tabachnick & Fidell, 2019), except for the GSI, whose distribution was slightly left skewed (1.53) and highly leptokurtic (3.07). A square root transformation of the GSI scores resolved this problem (asymmetry: 0.39; kurtosis: 0.11) and was therefore used in all other analyses. Note that four control participants did not report their length of service: thus, all analyses involving this variable were performed on 225 participants.

Regarding group differences, the between-subject ANCOVAs revealed significant or marginally significant differences for dispositional MD, $F(1, 220) = 3.65$, $p = 0.057$, $\eta^2_p = 0.016$, $\eta^2_p = 0.01$ and GSI scores, $F(1, 220) = 4.46$, $p = 0.036$, $\eta^2_p = 0.02$. Health professionals scored higher than controls in dispositional MD [$M = 4.85$ vs. $M = 4.50$ years], suggesting that they tended to have higher levels of awareness and attention at the present time, but lower in the GSI [$M = 0.80$ vs. $M = 0.92$ years], suggesting that they had less psychopathological symptoms. No differences were obtained for the PSS scores, $F(1, 220) = 0.30$, $p = 0.58$, $\eta^2_p = 0.00$ (see Table 1).

Pearson's correlations between the examined variables are reported in Table 2. As can be noted, when considering all participants, the results confirmed our expectations, indicating that a) dispositional MD was negatively associated with both PSS and GSI scores, and b) PSS scores were positively associated with GSI scores. Interestingly, when the analysis was broken down by group, we also found that the negative correlations of dispositional MD with PSS and GSI scores were significant for health professionals, but not for controls.

Tab. 2. Pearson's correlations between the MAAS, PSS and GSI scores.

	1	2	3
<i>Total sample</i>			
1. MAAS	1.00		
2. PSS	-0.23**	1.00	
3. GSI	-0.22**	0.63**	1.00
<i>Health professionals</i>			
1. MAAS	1.00		
2. PSS	-0.29**	1.00	
3. GSI	-0.37**	0.62**	1.00
<i>Controls</i>			
1. MAAS	1.00		
2. PSS	-0.17†	1.00	
3. GSI	-0.03	0.63**	1.00

Note. †: $0.06 < p < 0.10$; *: $p \leq 0.05$; **: $p \leq 0.01$; MAAS = Mindful Attention Awareness Scale; PSS = Perceived Stress Scale; GSI = Global Severity Index (Symptom Check List-90-R)

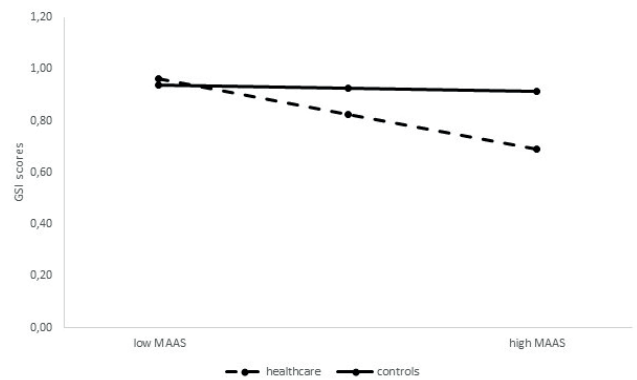
Finally, the results of the regression analysis are summarized in Table 3, which reports the β values of the final model including all variables entered in the first, second and third steps. The analysis showed that the overall model was significant, $F(12, 211) = 14.83, p < 0.001$. Demographic variables explained about 5% of the variance in the GSI scores, $F(6, 217) = 1.79, p = 0.10$: only the contribution of gender was significant ($p = 0.046$), suggesting that females reported more psychopathological symptoms than males. Group and psychological variables explained about 39% of the variance, $F(3, 214) = 48.98, p < 0.001$: not, surprisingly, the contribution of PSS was significant ($p < 0.001$), suggesting that participants having higher levels of perceived stress reported more psychopathological symptoms (as compared to participants having lower levels of perceived stress). In line with the above analyses, the contribution of group was also significant ($p = 0.009$), confirming that psychopathological symptoms were lower in healthcare professionals than in control participants. Finally, the interaction terms explained an additional 2% of the variance, $F(3, 211) = 2.91, p = 0.035$: in particular, the negative interaction between group and dispositional MD reached the significance level ($p = 0.006$). To represent this interaction, we plotted GSI scores for healthcare professionals and control participants at low (-1 SD) and high (+1 SD) levels of dispositional MD (Frazier et al., 2004). As illustrated in Figure 1, the beneficial influence of dispositional MD on GSI scores was significant for healthcare professionals, $\beta = -0.24, t = 3.08, p = 0.003$, but not for controls, $\beta = 0.05, t = 0.63, p = 0.52$. Thus, high levels of dispositional MD reduced the incidence of psychopathological symptoms in healthcare professionals, but not in controls.

Tab. 3. Hierarchical regression predicting the GSI scores.

Step	Predictors	β	t	R	R ²	ΔR^2
Step 1	Age	-0.01	-0.07	0.21	0.05	0.05
	Education	-0.03	-0.52			
	Length of service	0.09	0.81			
	Gender	0.11	2.01*			
	Marital status	0.00	-0.00			
	Use of meditation practices	0.03	0.55			
Step 2	Group	-0.16	-2.65	0.66	0.43	0.39
	PSS	0.68	8.55**			
	MAAS	0.06	0.86			
Step 3	PSS \times Group	-0.11	-1.46	0.68	0.45	0.02
	MAAS \times Group	-0.20	-2.76**			
	MAAS \times PSS	-0.01	-0.24			

Note. *: $p \leq 0.05$; **: $p \leq 0.01$; MAAS = Mindful Attention Awareness Scale; PSS = Perceived Stress Scale; GSI = Global Severity Index (Symptom Check List-90-R)

Fig. 1. Graphical representation of the interaction between dispositional mindfulness (MAAS) and group (dependent variable: GSI scores).



Previous studies testing the hypothesis that dispositional MD should moderate the association between perceived stress and psychopathological symptoms (Bränström et al., 2011; Bergin & Pakenham, 2016; Lu et al., 2019) were primarily focused on depression and anxiety, whereas the GSI is a global measure taking into account a wide range of psychopathological symptoms. We therefore performed two additional regression analyses on the depression and anxiety subscales of the SCL-90. The results are illustrated in tables 4a and 4b.

Tab. 4a. Hierarchical regressions predicting depression.

Step	Predictors	Depression				
		β	t	R	R ²	ΔR^2
Step 1	Age	0.15	1.49	0.23	0.05	0.05
	Education	-0.01	-0.32			
	Length of service	-0.07	-0.65			
	Gender	0.11	2.30*			
	Marital status	-0.01	-0.35			
	Use of meditation practices	0.04	0.82			
Step 2	Group	-0.16	-2.78**	0.69	0.48	0.43
	PSS	0.75	9.86**			
	MAAS	0.06	0.85			
Step 3	PSS \times Group	-0.15	-2.06*	0.71	0.51	0.02
	MAAS \times Group	-0.18	-2.55**			
	MAAS \times PSS	-0.03	-0.75			

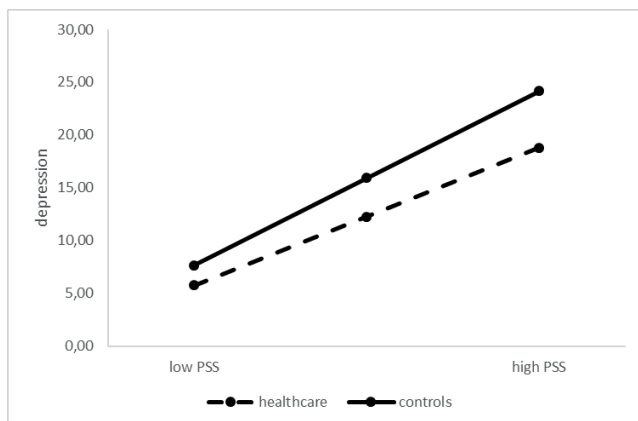
Note. †: $0.06 < p < 0.10$; *: $p \leq 0.05$; **: $p \leq 0.01$; MAAS = Mindful Attention Awareness Scale; PSS = Perceived Stress Scale; GSI = Global Severity Index (Symptom Check List-90-R)

Tab. 4b. Hierarchical regressions predicting anxiety scores.

Step	Predictors	Anxiety				
		β	t	R	R ²	ΔR^2
Step 1	Age	0.04	0.34	0.20	0.04	0.04
	Education	-0.05	-0.73			
	Length of service	0.01	0.11			
	Gender	0.08	1.45			
	Marital status	-0.02	-0.37			
Step 2	Use of meditation practices	-0.01	-0.26			
	Group	-0.12	-1.77†	0.53	0.28	0.24
	PSS	0.51	5.57**			
Step 3	MAAS	0.06	0.70			
	PSS × Group	-0.04	-0.52	0.55	0.30	0.02
	MAAS × Group	-0.19	-2.23*			
	MAAS × PSS	-0.06	-1.09			

Note. †: $0.06 < p < 0.10$; *: $p \leq 0.05$; **: $p \leq 0.01$; MAAS = *Mindful Attention Awareness Scale*; PSS = *Perceived Stress Scale*; GSI = *Global Severity Index (Symptom Check List-90-R)*

Fig. 1. Graphical representation of the interaction between perceived stress (PSS) and group (dependent variable: depression scores).



As can be seen, the interactions between dispositional MD and PSS were never significant, thus replicating the conclusion of the primary analysis. Interestingly, however, the interaction between PSS and group reached the significance level in the regression analysis predicting depression scores ($p = 0.040$). As illustrated in Figure 2, the positive association between PSS and depression scores was significant for both healthcare professionals, $\beta = 0.56$, $t = 7.54$, $p < 0.001$, and control participants, $\beta = 0.79$, $t = 9.78$, $p < 0.001$, but was less pronounced in the former group. That is, high levels of perceived stress had a lower impact on depressive symptoms in healthcare professionals than in control participants.

Discussion

The present study examined the concurrent associations between dispositional MD, perceived stress and psychopathological symptoms in healthcare professionals and control participants. Several interesting results emerged. First, there was a tendency for healthcare professionals to exhibit higher MD levels than control participants. This result should be evaluated with caution, since the difference did not reach the standard significance level. Yet, it was unexpected and in

contrast with our expectations, because nurses showed the lowest levels of subjective well-being in previous studies (e.g., Atanes et al., 2015). Looking at our raw MAAS scores and comparing them with the mean values reported by Veneziani and Voci (2015) in a sample of 465 Italian adults, it appears that the difference was due to the mean MD level of our control participants being considerably lower than that reported in the normative sample (4.49 vs. 4.86). In addition, healthcare professionals showed significantly less psychopathological symptoms than controls. The mean GSI score observed in our control participants (0.98) was significantly higher than that attained by healthcare professionals and close to the clinical cut-off score (≥ 1 , according to Prunas et al., 2012), indicating that they exhibited a potential psychopathological risk. It appears, then, that the results observed in the present study were primarily due to the specific characteristics of our control participants. At least two reasons could be proposed for this outcome. First, they were recruited among people who attended the hospital for making medical examinations or for visiting patients and were therefore more likely to report high levels of psychological distress. Second, our study was conducted during a period of pandemic emergency. A plethora of studies found increased rates of psychopathological symptoms in the general Italian population during the COVID-19 outbreak (e.g., Amendola, Spensieri, Hengartner & Cerutti, 2021). Higher levels of COVID-19 fear have been also linked to lower levels of mindful awareness in a sample of Turkish individuals (Saricali et al., 2022). In this respect, our study might suggest that healthcare professionals were better able than controls to cope with COVID-19-related worries and limit the negative impact of this factor on MD levels. Admittedly, this is a speculative explanation, since we did not examine COVID-19 fear in the present study.

The results of correlational analyses were largely consistent with our expectations, showing that MD was negatively associated with both perceived stress and psychopathological symptoms (suggesting that participants having higher MD levels were less likely to suffer stress and to show psychopathological symptoms), whereas perceived stress was positively associated with psychopathological symptoms (suggesting that participants having higher levels of perceived stress were more likely to exhibit psychopathological symptoms). As illustrated in the Introduction, negative correlations between MD and psychopathological symptoms have been widely reported in the literature, both in the general population (Tomlinson et al., 2018) and in healthcare professionals (Atanes et al., 2015; Westphal et al., 2015). Likewise, significant negative links between MD and perceived stress have been previously found in both healthcare professionals (Atanes et al., 2015; Lu et al., 2019) and community dwelling adults (Bergin & Pakenham, 2016; Bränström et al., 2011). Importantly, when the two subsamples were separately analyzed, it turned out that the negative associations of dispositional MD with perceived stress and psychopathological symptoms were significant in healthcare professionals, but only marginal (for perceived stress) or non-significant (for psychopathological symptoms) in control participants. Thus, it appears that the direct, positive effects of MD on psychological wellbeing were particularly pronounced in this working category. Such a conclusion was

further supported by the regression analyses, which showed that group moderated the association between dispositional MD and GSI scores. Overall, these findings are coherent with prior evidence indicating that MD may represent an important protective factor for those professional categories that, like healthcare professionals, are particularly exposed to emotional and interpersonal stressors (Westphal et al., 2015) and have higher risks of burnout (Salvarani et al., 2019). Interestingly, and in contrast with the predictions derived from prior research (Bränström et al., 2011; Bergin & Pakenham, 2016; Westphal et al., 2015), our analyses indicated that this protective influence was not due to the fact that dispositional MD reduced the negative impact of perceived stress on psychopathological symptoms, since the interactions between MD and perceived stress failed to reach the significance level in all cases – even when the analyses were specifically focused on depression and anxiety symptoms (as in the above-mentioned studies). In their review, Tomlinson et al. (2018) identified two potential mediators of the direct, positive influence of dispositional MD on psychological health: namely, cognitive thinking styles and emotion regulation strategies. For the first factor, an increasing number of studies documented how individuals with high MD levels are less likely to get caught up in negative cognitive thinking processes, such as rumination (e.g., Petrocchi & Ottaviani, 2016), procrastination (e.g., Schutte, & del Pozo de Bolger, 2020) and pain catastrophizing (e.g., Day, Smitherman, Ward, & Thorn, 2015; Kiken & Shook, 2012; Mun, Okun, & Karoly, 2014). Similarly, regarding the second factor, there is now ample evidence indicating that dispositional MD is related to the use of more efficient emotion regulation strategies (such as reappraisal or thinking of pleasant things: e.g., Coffey & Hartman, 2008; Hanley, Palejwala, Hanley, Canto, & Garland, 2015; Luberto, Cotton, McLeish, Mingione, & O'Bryan, 2014; McDonald et al., 2016); moreover, high levels of dispositional MD have been associated with lower emotional reactivity to aversive situations, improved emotional recovery, and higher emotional intelligence (e.g., Brown, Weinstein, & Creswell, 2012; Wang & Kong, 2014). Since most of the above-mentioned studies were conducted in the general population, more research is needed to determine whether these two factors may account for the negative association between dispositional MD and psychopathological symptoms even in healthcare professionals.

The present study has limitations that must be acknowledged. First, we assessed concurrent, rather than longitudinal relations, implying that our results cannot be interpreted in terms of causal effects (see Westphal et al., 2021, for a longitudinal study showing that MD predicts less depression and anxiety in emergency care personnel). Second, our sample of healthcare professionals was primarily represented by nurses: thus, we could not determine whether different professional categories exhibited different levels of MD, perceived stress and psychopathological symptoms (Atanes et al., 2015). Third, although the MAAS questionnaire has been largely used in previous research (Tomlinson et al., 2018), it has the inherent limitation of providing a global measure of MD, without differentiating between its subcomponents. Additional studies are needed to ascertain whether the present findings may apply to all facets of MD or only to some of them.

Despite these limitations, our study aligns with an emerging body of research showing that dispositional MD may represent a critical personality trait for healthcare professionals. The practical implication is that interventions aimed at improving the psychological well-being of healthcare professionals should be specifically targeted at enhancing dispositional MD. Indeed, health organizations have begun to implement stress-management and well-being enhancement programs based on meditation (e.g., guided breathing) and/or mindfulness-based training, in which healthcare professionals learn to be attentive to the present moment and self-observe in an objective and detached manner (Kabat-Zinn, 2003). Several meta-analyses documented how these interventions may be effective in decreasing depressive and anxiety symptoms and increasing the psychological well-being of healthcare professionals (e.g., Spinelli, Wisener, & Khoury, 2019). The results of the present study are consistent with these conclusions and therefore suggest that healthcare professionals would greatly benefit from attending regular mindfulness-based programs, starting from the period in which they attend university courses (high levels of stress have been repeatedly documented, for example, in nursing students: Turner & McCarthy, 2017).

Note

¹ Note that, although the data for the present study were collected during the outburst of the COVID-19 pandemic, we were not specifically interested in examining its impact on the mental wellbeing of healthcare professionals. Thus, no measure related to COVID-19 was included in the survey. Readers interested in this topic can refer to a number of reviews and meta-analyses (e.g., Batra, Singh, Sharma, Batra, & Schvaneveldt, 2020; da Silva Neto, Benjamim, de Medeiros Carvalho, & Neto, 2021; Pappa, Ntella, Giannakas, Giannakoulis, Papoutsis, & Katsaounou, 2020).

² For both samples, mean length of service was computed as the total employment time (both part-time and full-time). The control group included 15 students, 6 housewives and 4 unemployed participants: in these cases, length of service was set to 0.

Author Contributions

Martina Finistrella: Conceptualization; Methodology; Investigation.

Luca Rizzi: Methodology; Investigation; Writing – Review & Edit.

Irene Messina: Writing – Review & Edit.

Daniele Saraulli: Writing – Review & Edit.

Pietro Spataro: Formal analysis; Data curation; Writing: Original Draft.

Conflict of interest

Authors have no conflict of interest to declare

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Ethical approval

The study was carried out in accordance with the principles laid down in the Declaration of Helsinki and all respondents signed an online informed consent. Ethical approval was provided by LUMSA University (n.2/2023)

Data availability statement

Raw data are available on request from the corresponding author [P. Spataro].

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