


ORIGINAL ARTICLE

Factors affecting the professional functioning of health care workers during the COVID-19 pandemic: A cross-sectional study

Semyon Melnikov RN PhD, Senior Lecturer¹  |
Shoshi Fridman RN MA, Senior Coordinator of Nursing Research² |
Anat Aboav RN MA, Head Nurse³ | Fariba Moore RN MA, Head Nurse⁴ |
Yael Cohen RN MA, Head Nurse⁵

¹Nursing Department, Steyer School of Health Professions, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

²Nursing Administration, Wolfson Medical Center, Holon, Israel

³Internal Department A, Wolfson Medical Center, Holon, Israel

⁴Internal Department B, Wolfson Medical Center, Holon, Israel

⁵Internal Department D, Wolfson Medical Center, Holon, Israel

Correspondence

Semyon Melnikov, RN PhD, Senior Lecturer, Nursing Department, Steyer School of Health Professions, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.
Email: melniko@tauex.tau.ac.il

Funding information

Emerging Nurse Researcher Award 2020, Phi Mu Chapter, England (Sigma Theta Tau International)

Abstract

Aim: To examine personal and organisational factors related to professional functioning of nurses and physicians during the COVID-19 pandemic.

Background: Exposure to COVID-19-related stressors has been associated with lower self-reported professional functioning among health care workers.

Methods: A cross-sectional study among 115 hospital workers during the COVID-19 pandemic in Israel was designed to explore (a) personal professional functioning, (b) clarity of guidelines, (c) work organisation by the management, and (d) health care workers' feeling of contribution to a global effort.

Results: A feeling of contribution to a global effort while treating patients with COVID-19 mediated the relationships between work organisation by the management and professional functioning ($\beta = .05, p < .05$). The clarity of guidelines for routine procedures ($\beta = .21, p < .05$) and a feeling of β contribution to a global effort ($\beta = .34, p < .01$) positively predicted professional functioning of nurses and physicians during COVID-19 pandemic ($R^2 = .19, p < .01$).

Conclusions: In order to achieve optimal functioning of health care workers in an emergency, managers should provide clear guidelines and promote workers' feelings of contribution to a global effort.

Implications for Nursing Management: The provision of clear guidelines and protocols is essential for efficient emergency management. Expressing appreciation for health care workers and providing positive feedback may improve professional functioning.

KEYWORDS

COVID-19, guideline clarity, health care workers, professional functioning, work management

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2022 The Authors. *Journal of Nursing Management* published by John Wiley & Sons Ltd.

1 | INTRODUCTION

On 11 March 2020, the World Health Organisation declared COVID-19 to be a pandemic (WHO, 2020a). Since then, many countries have experienced a series of epidemiologic waves of COVID-19 infections. By the end of March 2022, more than 486 million cases and more than 6.1 million deaths due to COVID-19 had been reported worldwide (Johns Hopkins University & Medicine, 2020). The percentage of health care workers (HCWs) who tested positive for COVID-19 was 51.7%, with 15.1% being hospitalized and 1.5% dead (Gholami et al., 2021). Between January 2020 and May 2021, around 115,500 out of the 135 million HCWs employed in human health and social activities lost their life due to COVID-19 (WHO, 2021).

At the beginning of the pandemic, hospitals became hot zones for COVID-19 treatment and transmission, and the volume of health care workers who contracted the disease led to a shortness of available manpower (Brindle & Gawande, 2020). US nursing homes whose staff contracted COVID-19 were more likely to experience shortages of licensed nurses and nurse aides and to be unable to fulfil the requirements of infection control (Xu et al., 2020).

1.1 | Professional functioning of health care workers during the COVID-19 pandemic

Exposure to COVID-19-related stressors was reported to be associated with mental health problems and a decrease in self-reported professional functioning among front-line HCWs in Australia and China (Hendrickson et al., 2020; Kang et al., 2020). Among nursing managers in mental health centres in Israel, the professional functioning focus changed from managerial to more clinical roles (Kagan et al., 2021). However, there is still a gap in knowledge concerning the factors that affect the professional functioning of health care professionals during a pandemic.

In general, functioning is defined as performing or being able to perform one's regular function (Thefreedictionary.com, 2014). In this study, the personal professional functioning refers to the performance of a variety of professional activities and roles by nurses and physicians during the COVID-19 pandemic.

1.2 | Effect of management on the professional functioning of health care providers

A study in a hospital in China reported that an emergency nursing management approach, leading to effective manpower mobilization, personnel training, supply of personal protective equipment (PPE), and motivating nurses to make a significant contribution, was associated with the provision of effective care to all hospitalized COVID-19 patients (Wu et al., 2020). At the same time, health care managers encountered various challenges during the COVID-19 pandemic that had a serious and direct impact on HCW functioning and quality of

care. Among these challenges were severe staff shortages caused by the unwillingness of HCWs to work under conditions with insufficient testing and a lack of personal protective equipment (Grabowski & Mor, 2020), as well as by their suffering from COVID-19 symptoms and being quarantined at home (Barnett & Grabowski, 2020). Other problems included a critical shortage of ICU beds and ventilators (Vincent & Creteur, 2020), a massive influx of patients (Robert et al., 2020), non-optimal shift work scheduling, which affected the physical and psychological well-being of workers (Gao et al., 2020), and a lack of appropriate professional experience among the staff (Bambi et al., 2020).

Management is defined as the act or manner (dictionary.com, 2022b). In this study, the management of health workers during the COVID-19 pandemic refers to handling the staff response to the pandemic, directing health provision by the staff, and to providing staff with the training, protections, rights, and tools necessary to undertake their roles. We found no studies in the literature on management functioning as perceived by their subordinates, and on the relationships between management functioning and the personal professional functioning of health care providers during the COVID-19 pandemic.

1.3 | Effect of clear clinical and administrative guidelines on the professional functioning of health care providers

Guidelines provided by managers are an important factor in the effective and professional functioning of staff. The nursing home staff cited education and training on prevention and control measures as most important strategies for coping with the COVID-19 pandemic (Zhao et al., 2021). Similarly, sufficient education and preparation supported nurses' confidence in their ability to cope during this period (Nowell et al., 2021). At the same time, health care workers in the UK noted the presence of changing and inconsistent guidelines and limited training during the COVID-19 pandemic (Vindrola-Padros et al., 2020). In addition, nurses caring for patients with COVID-19 in the US described inadequate preparation and lack of information and direction for caring for patients, including how to provide COVID postmortem care (Kellogg et al., 2021). Similarly, the lack of guidelines for COVID-19 management was among the difficulties noted by infectious disease physicians (Park et al., 2020).

Guidelines are usually defined as a guide to, or indication of, a future course of action (dictionary.com, 2022a). In this study, guidelines were defined as clinical recommendations provided to the health care staff by the hospital management concerning the treatment of patients with COVID-19 and their families, risk assessment, infection prevention and control precautions, as well as administrative directives such as the isolation of patients with suspected or confirmed COVID-19. We found no studies that examined the association between the perceived clarity of guidelines and personal professional functioning among nurses and physicians treating COVID-19 patients.

1.4 | Effect of feelings experienced by health care providers on professional functioning

Previous studies demonstrated that positive emotions significantly predict the efficiency of individual performance in the workplace (Sahu & Srivastava, 2017). In contrast, feelings such as burnout, exhaustion, doubts about continuing in the nursing profession, feeling unappreciated, and experiencing injustice and ignorance, led to decreased motivation and performance among nurses during the COVID-19 pandemic (Cengiz et al., 2021).

Feelings are defined as an emotional state or reaction (<https://www.merriam-webster.com>, 2022). In this study, health care workers' feelings were defined as the emotional responses of the participants to their working experience during the COVID-19 pandemic. We found no studies that examined the association between feelings experienced by nurses and physicians and their personal professional functioning during the COVID-19 pandemic.

The purpose of the current study was to examine the association between the clarity of guidelines, management functioning, and feelings while treating patients with COVID-19, and the personal professional functioning of nurses and physicians working with confirmed/suspected COVID-19 patients in a tertiary medical centre in Israel. The results of this study could be used to inform guidelines designed to improve the professional functioning of health care workers during a future pandemic.

2 | METHODS

2.1 | Design

This was a cross-sectional study.

2.2 | Setting and participants

In response to the COVID-19 pandemic, the medical centre diverted eight internal medicine wards comprising six internal medicine, one neurology, and one thoracic medicine department, to the treatment of COVID-19. The selection was based on the availability of an intensive care unit for the treatment of mechanically ventilated patients, and of staff trained to treat such patients. During the first two waves of the COVID-19 pandemic in Israel, one ward in the hospital was designated for patients suspected of having COVID-19. Following verification of the COVID-19 diagnosis, patients were transferred from the ward for "suspected" to two COVID-19 dedicated internal division wards that cared for COVID-19-verified patients. This situation lasted 2 to 3 months, after which the functions were transferred to another three wards out of the eight originally selected.

The convenience sample consisted of 115 health care workers (97 nurses and 18 physicians) working in a tertiary medical centre. The sample size was based on methodological and statistical considerations. Specifically, according to the G*Power 3.1.9.2 program for

power analysis (Faul et al., 2009), for a medium effect size of .15, an alpha error probability of .05, desired power of .80, and six predictor variables, the minimum sample size required for linear multiple regression is 98 participants.

2.3 | Data collection

The study was approved by the ethics committee of the medical centre where the study took place (approval number 0113-20 WOMC). A research assistant who did not work in any of the internal division wards distributed questionnaires between March and July 2020, a period that included two waves of the COVID-19 pandemic in Israel. The questionnaire was distributed to 185 nurses and 90 physicians who had participated in the 2- to 3-month rotation of care of confirmed and suspected patients with COVID-19. Nurses and physicians who provided informed consent were given a questionnaire to complete. The response rate was 52.4% and 20% for nurses and physicians, respectively. The distributed material also contained information describing the purposes of the study and a guarantee of the respondents' anonymity and data confidentiality.

2.4 | Tools

The self-administered questionnaire was comprised of five parts that examined: (a) perceived personal professional functioning, (b) clarity of managerial guidelines, (c) respondents' feelings while treating patients with COVID-19, (d) perception of management functioning, and (e) sociodemographic characteristics. The authors constructed the sections (b), (c), (d), and (e) in accordance with recommendations for questionnaire design (Krosnick, 2018; Rattray & Jones, 2007). A panel of experts comprising five senior nurses (three internal medicine department head nurses, one medical centre administration senior nurse, and another senior nurse who is an expert in hospital functioning during disaster) examined the validity, comprehensibility, and feasibility of the questionnaire. Prior to the distribution of questionnaires, a pilot was conducted among ten nurses working at three different internal wards. Some of the questions were subsequently modified according to the pilot participants' comments. In order to test the factor structure empirically, an exploratory factor analysis (EFA) was performed on all questionnaires. Kaiser-Meyer-Olkin (KMO), Bartlett's test of sphericity (BTS) chi-square, and principal component analysis with Promax rotation with an eigenvalue greater than 1 were performed and the results are presented below.

a. Perceived personal professional functioning was examined by a tool used previously by the authors (Kagan et al., 2017; Melnikov et al., 2013) (Appendix S1, Part 2). The original scale consisted of eight statements related to the perception of personal professional functioning of the respondent, with four positively scored and four reverse scored. The answers ranged on a scale from 1 (*absolutely*

disagree) to 5 (*absolutely agree*). A higher mean score indicates a higher level of perceived professional functioning. The original factor analysis of four positively and four reversed worded items led to the production of two distinct concepts: good professional functioning and worse professional functioning. According to van Sonderen et al. (2013) and Zhang et al. (2016), the reversed worded items may not introduce the conceptual differences, at the same time, thereby introducing a response bias that poses a threat to the validity of the scale (van Sonderen et al., 2013; Zhang et al., 2016). For this reason, four reversed worded items were excluded from the analysis. The KMO of the four remaining positively scored items was .68, with BTS chi-square 117.37, $p < .001$, and was judged appropriate. One factor with an eigenvalue of 2.34 explained 58.4% of the variance. The items had a significant factor loading, ranging from .76 to .81. The one factor structure comprised the factor named "Personal professional functioning" (four items). Examples of these items are: "I quickly organised myself to handle any situation on the ward" and "Even after a few hours of work, I am functioning well." Cronbach's alpha for the factor "Personal professional functioning" was .76.

- b. Clarity of managerial guidelines was examined by a questionnaire constructed by the members of the expert panel (Appendix S1, Part 3). Items were designed to assess the degree of comprehensibility and clarity of management guidelines distributed by the hospital administration during the COVID-19 pandemic in Israel. The scale consisted of 12 statements and respondents were asked to rate their agreement regarding guideline clarity, on a scale of 1 (*absolutely unclear*) to 5 (*absolutely clear*). The higher the mean score, the higher the clarity of the organisational guidelines and instructions for the participant. The KMO was .81, BTS chi-square 1044.74, $p < .001$. Two factors with eigenvalues of 2.02 and 6.45 explained 65.13% of the variance. The items had a significant factor loading, ranging from .67 to .9. The two factor structure comprised Factor 1 (five items), named "Clarity of guidelines for routine treatments," item example: "Clinical care of patients with COVID-19," and Factor 2 (seven items), named "Clarity of guidelines for advanced treatments," item example: "Clinical care of patients with COVID-19 whose medical condition is deteriorating." Cronbach's alpha for Factor 1 "Clarity of guidelines for routine treatments" was .80 and for Factor 2 "Clarity of guidelines for advanced treatments" .92, and the value for the whole scale was .91.
- c. Management functioning was examined by a 9-item tool used previously by the authors (Melnikov et al., 2019) and adapted for the current study (Appendix S1, Part 4). The items in this tool examined different aspects and outcomes related to work management and organisation of senior managers, as well as leadership and emotional support provided to the staff during the COVID-19 pandemic. The possible answers ranged on a scale from 1 (*absolutely disagree*) to 5 (*absolutely agree*). A higher mean score indicates a more positive perception of hospital and ward management functioning. The KMO was .84, BTS chi-square was 596.72, with

TABLE 1 Sociodemographic data ($n = 115$)

Variable	Number (%)
Gender	
Men	38 (33.0)
Women	77 (67.0)
Profession	
Nurses	97 (84.3)
Physicians	18 (15.7)
Full/part-time: nurse number (%)	
Full-time	87 (75.7)
Part-time	23 (20.0)
Missing	5 (4.3)
Education	
RN	13 (11.3)
RN BA	59 (51.3)
RN MA	20 (17.4)
MD	18 (15.7)
Other	2 (1.7)
Missing	3 (2.6)
Current place of work	
Dedicated COVID-19 ward	26 (22.6)
Ward with patients with suspected COVID-19	41 (35.7)
Non-COVID-19 ward	42 (36.5)
Missing	6 (5.2)
Frequency of the work in dedicated/suspected COVID-19 wards	
Every shift	48 (41.7)
Sometimes	55 (47.8)
Never entered	9 (7.8)
Missing	3 (2.6)
Volunteered to work in dedicated/suspected COVID-19-wards	
Yes	24 (20.9)
No	87 (75.7)
Missing	4 (3.5)
COVID training participation	
Yes	80 (69.6)
No	31 (27.0)
Missing	4 (3.5)
Age in years: mean (SD), median, range	40.0 (10.2), 40, 23–63
Seniority in years: mean (SD), range	16.6 (11.7), 1–44

$p < .001$. Two factors with eigenvalues of 1.85 and 4.76 explained 73.9% of the variance. The items had a significant factor loading, ranging from .72 to .94. The two factor structure was composed of Factor 1, named "Emotional management" (three items) which assessed the management ability to be aware of, and constructively handle, employees' emotional reactions to the situation. Item

example: “In my department debriefing meetings take place in order to allow staff members to vent their feelings,” and Factor 2, named “Work organisation” (six items), which assessed factors including the ability of the management to plan, organise, and manage the allocation of responsibilities in the department, including the provision of counselling and leadership, item example: “The division of roles among the staff members during the COVID-19 pandemic is clear.” Cronbach’s alpha for Factor 1 “Emotional management” was .88 and for Factor 2 “Work organisation” .90, and the value for the whole scale was .89.

- d. Respondents’ feelings about their work during the COVID-19 pandemic was examined by a 12-item tool constructed by the focus group (Appendix S1, Part 5). The items in this tool examined possible feelings experienced by nurses and physicians while treating patients with COVID-19. The possible answers ranged from 1 (*absolutely disagree*) to 5 (*absolutely agree*). A higher mean score indicates more positive feelings. The KMO was .75, BTS chi-square was 472.24, with $p < .001$. Two factors with eigenvalues of 2.43 and 3.88 explained 52.5% of the variance. The items had a significant factor loading, ranging from .55 to .89. The two factor structure comprised Factor 1, named “Emotional detachment from patient” (7 items), item example: “Lack of empathy towards the patient,” and Factor 2, named “A feeling of contribution to a global effort” (5 items), item example: “A sense of appreciation by society.” Cronbach’s alpha for Factor 1 “Emotional detachment from patient” was .82 and for Factor 2 “A feeling of contribution to a global effort” was .72, and the value for the whole scale was .74.
- e. Demographic characteristics included age, gender, profession, managerial position, and job seniority (Table 1).

2.5 | Statistical analysis

Descriptive statistics and differences between the variables were reported using means (M) and standard deviations (SD) for continuous variables, and percentages for categorical variables. Pearson’s correlation was performed to examine the relationships between study variables. Multivariable linear regression was performed to explore the dependent variable variance. In the current study, Work organisation by the management was conceptualized as the independent variable (IV), A feeling of contribution to a global effort as a mediator, and Personal professional functioning as the dependent variable (DV). A mediator is defined as a variable that accounts, in whole or in part, for the relationship between the IV and DV (Baron & Kenny, 1986). Mediator analysis was performed using the bootstrap statistical method, with “A feeling of contribution to a global effort” entered as mediator to the mediation model (Hayes, 2017; Preacher & Hayes, 2008). The significance of the indirect effect of the IV (Work organisation by the management) on the DV (Personal professional functioning) was examined through the mediator (A feeling of contribution to a global effort).

2.6 | The mediation hypotheses

The effect of work management on personal professional functioning occurs directly and indirectly via a mediator (A feeling of contribution to a global effort):

Hypothesis 1. Better Work organisation by the management (IV) is associated with better Personal professional functioning (DV).

Hypothesis 2. Better Work organisation by the management (IV) is associated with higher values for A feeling of contribution to a global effort (M).

Hypothesis 3. Higher values for A feeling of contribution to a global effort (M) are associated with better Personal professional functioning (DV).

3 | RESULTS

3.1 | Participant characteristics

A total of 115 participants completed the questionnaires: 97 (84.3%) nurses, 77 (67%) women, and 59 (51.3%) with a Bachelor of Science in Nursing (BSN) Degree. Participants’ ages ranged between 23 and 63, with a mean age of 40 (SD = 10.2). The mean seniority at work was 16.6 (SD = 11.7) years, with a range of 1 to 44 years. Eighty (69.6%) participants took part in COVID-19 training provided by the medical centre (Table 1).

3.2 | Descriptive statistics and differences between groups

The mean scores (all scales on the range 1 to 5) of the main study variables for the whole sample were as follows: Personal professional functioning – 3.87 (SD = .81); 1. Clarity of guidelines: 1a. Clarity of guidelines for routine procedures – 4.04 (SD = 1.23), 1b. Clarity of guidelines for advanced procedures – 4.46 (SD = 1.85); 2. Management functioning: 2a. Work organisation – 2.77 (SD = 1.1), 2b. Providing emotional support to the staff – 2.92 (SD = 1.17); 3. Respondents’ feeling while treating patients with COVID-19: 3a. Emotional detachment from the patient – 2.35 (SD = .98), 3b. A feeling of contribution to a global effort – 3.29 (SD = .58).

Analysis of full or part time work found that full time workers rated their personal professional functioning significantly higher, than part-time employees, $M = 3.96$, $SD = .81$ versus $M = 3.53$, $SD = .78$, $t(108) = 2.28$, $p = .03$. People who had participated in the COVID-19 training provided reported significantly higher management functioning (“Work organisation factor”) than those who had not, $M = 3.02$, $SD = .97$ versus $M = 2.19$, $SD = 1.04$, $t(103) = 3.85$, $p < .001$. Compared with participants who worked all their shifts in the COVID-19

ward, those who worked there only intermittently reported a lower clarity of guidelines, "advanced procedures factor," $M = 3.86$, $SD = 1.19$ versus $M = 4.95$, $SD = 2.15$, $t(107) = 3.16$, $p = .001$. There were no significant differences between participants with respect to other socio-demographic or professional (nurses vs. physicians) variables.

3.3 | Relationships between variables

The results of correlation analyses between main study variable are presented in Table 2. Clarity of guidelines for routine procedures, A feeling of contribution to a global effort, and Work organisation by the management were positively associated with Personal professional functioning. Clarity of guidelines for both routine and advanced procedures were negatively associated with feelings of emotional detachment from patient. Clarity of guidelines for both routine and advanced procedures were positively associated with emotional support provided by the management.

3.4 | Multivariable linear regression analysis

Multivariate linear regression analysis was performed to explore the contribution of main study variables to the explanation of personal professional functioning of nurses and physicians. The results (Table 3) revealed that Clarity of the guidelines for routine procedures and A feeling of contribution to a global effort positively predict

Personal professional functioning and explain 19% of the dependent variable variance.

3.5 | Mediation analysis

The results of the mediation model based on 5000 bootstrap analyses indicated that Work organisation (IV) significantly predicted A feeling of contribution to a global effort (M; path a; $\beta = .12$, 95% CI .01–.22). A feeling of contribution to a global effort (M) significantly predicted Personal professional functioning (DV; path b; $\beta = .45$, 95% CI .19–.71). Work organisation (IV) together with A feeling of contribution to a global effort (M; $a \times b$) significantly predicted Personal professional functioning ($\beta = .05$, 95% CI .001–.15, Figure 1). No significant correlation was found between Work organisation (IV) and Personal professional functioning (DV; direct effect, path c'; $\beta = .13$, 95% CI $-.01$ –.27). The bootstrapping results revealed a significant total effect (path c; $\beta = .18$, 95% CI .04–.33, Table 4).

4 | DISCUSSION

The clarity of guidelines for routine procedures and a feeling of contribution to a global effort positively predicted the personal professional functioning of nurses and physicians. In addition, a feeling of contribution to a global effort served as a mediator of the relationships between work organisation by the management and personal professional functioning.

TABLE 2 Correlation analysis between the main study variables ($n = 111$)

Variables	1	2	3	4	5	6	7
1. Personal professional functioning	-						
2. Clarity of guidelines (Routine procedures factor)	.24*	-					
3. Clarity of guidelines (Advanced procedures factor)	.11	.43**	-				
4. Feelings (Emotional detachment from patient factor)	-.17	-.26**	-.30**	-			
5. Feelings (A feeling of contribution to a global effort)	.32**	.01	.01	.17	-		
6. Management functioning (Emotional support factor)	.11	.28*	.28**	-.11	.04	-	
7. Management functioning (Work organisation factor)	.23**	.31**	.02	.07	.21*	.35**	-

Note: The significant statistical effects ($p < .05$ or $p < .01$) are in bold.

* $p < .05$. ** $p < .01$.

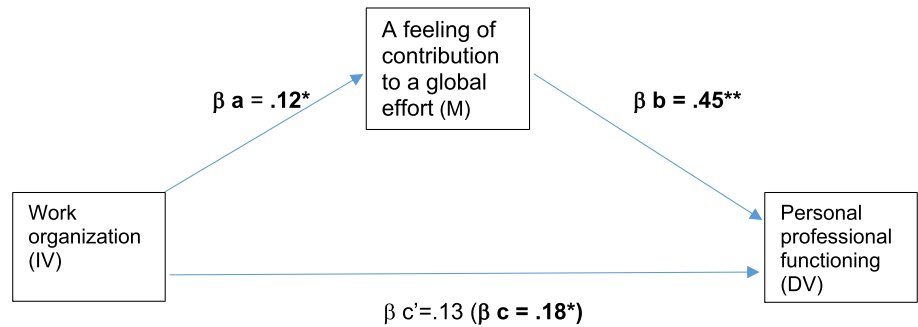
TABLE 3 Multivariate linear regression analysis of personal functioning ($n = 107$)

Independent variables	B	SE	β	t	p	95% CI
Constant	1.58	.48		3.28	<.001	.62–2.53
Clarity of guidelines (Routine procedures factor)	.14	.06	.21	2.22	.03	.02–.27
Feelings (A feeling of contribution to a global effort factor)	.47	.13	.34	3.70	<.001	.22–.73
Management (Work organisation factor)	.07	.08	.09	.91	.08	-.09–.22

Note: $R^2 = .19$, $F = 8.04$, $p < .001$. The significant statistical effects ($p < .05$ or $p < .001$) are in bold.

Abbreviations: B, unstandardized coefficients; Beta, standardized coefficients.

FIGURE 1 A feeling of contribution to a global effort mediates the relationships between work organisation and personal professional functioning



* $P < .05$

** $P < .01$

This last finding is in accordance with previous reports that practical support provided to nurses by the state, society, and hospitals contributed to an increased motivation that enabled nurses to treat COVID-19 patients regardless of other concerns (Jia et al., 2021). Nurses involved in the COVID-19 rescue task reported that support from the hospital leaders and colleagues caused them to feel safer, and increased their courage and motivation to combat the COVID-19 pandemic (Sheng et al., 2020). It seems that in this study, the general engagement of the public, colleagues and hospital managers in fighting the pandemic boosted nurses' and physicians' morale, sense of meaning, and a feeling of contribution to a global effort which raised their motivation and improved professional functioning.

Our results also indicated that a feeling of contribution to a global effort was positively associated with personal professional functioning. This observation is in line with the results described by Okediran et al. (2020), where health care workers responding to a call to responsibility, expressed optimism regarding the management of COVID-19 patients, and felt that their contribution made patients feel better (Okediran et al., 2020). Working during the pandemic was reported to promote a sense of camaraderie and feeling of community among UK health professionals caring for people with COVID-19 (Baldwin & George, 2021). Jetly et al. (2020) likened the global effort in dealing with the COVID-19 to a "home front" scenario in which a military mission-focused approach with clear objectives and responsibilities leads health care workers to defend their home (Jetly et al., 2020). Similarly, the association between a feeling of contribution to a global effort and professional functioning seen in the current study may reflect the focus on protecting the "home front."

In the current study, one of the items of the factor "A feeling of contribution to a global effort" was "the sense of pride." Committed COVID-19 nurses working with COVID-19 patients expressed satisfaction in knowing that they were able to contribute to the fight with global pandemic and this gave meaning to their work (Lee & Lee, 2020). UK health professionals expressed a similar sense of pride in their ability to fight against the pandemic, and as a result felt better

prepared to face such challenges in the future (Baldwin & George, 2021). Tracy and Robins (2007) distinguished two forms of pride: authentic pride, which is typically based on specific accomplishments, and hubristic pride, which is more related to narcissism and shame (Tracy & Robins, 2007). In the current study, the participants were apparently filled with a sense of authentic pride based on the accomplishment of treating patients with COVID-19, which then led to better professional functioning. In this context, Weidman et al. (2016) also demonstrated that authentic pride leads to improved performance (Weidman et al., 2016). Another item of the factor "A feeling of contribution to a global effort" was "A sense of appreciation by the environment," where a previous study demonstrated that "to be appreciated" and "to receive recognition" were among factors motivating health sector workers (Dieleman et al., 2003). Nurses who cared for COVID-19 patients expressed pleasure in the support they received from social media, and from patients' good will, respect, and gratitude, as well as from a reward and welfare system designed to support and motivate nurses (Sun et al., 2020). Similarly, during a MERS-CoV outbreak, the health care workers reported that positive attitudes expressed by colleagues had the biggest impact in reducing stress, but that they also appreciated the extra financial compensation and recognition provided by the hospital (Khalid et al., 2016). In the current study, it seems that a sense of being appreciated may explain the better professional functioning reported by the respondents. It is therefore important for hospital and health care administrators and nursing leaders to provide health care workers with mental and physical rewards so that positive feedback and reinforcement is given, as well as monetary remuneration and welfare support.

Personal professional functioning was positively associated with the clarity of guidelines. Previous reports have noted that unclear guidelines issued during an emergency situation or crisis may adversely affect the functioning of frontline health care workers. Specifically, ambiguous or otherwise unclear guidelines added to health care workers' confusion about the protocols of infection prevention and control to be followed when dealing with SARS, H1N1, Middle East respiratory syndrome (MERS), tuberculosis, or seasonal influenza

TABLE 4 Summary of mediator model analyses using 5000 bootstraps ($n = 107$)

Independent variable (IV)	Mediating variable (M)	Dependent variable (DV)	Effect of IV on M		Effect of M on DV		Direct effect		Indirect effect		Total Effect		
			path a β	95% CI	path b β	95% CI	path c' β	95% CI	a \times b β	95% CI	path c β	95% CI	R ²
Work organisation (IV)	A feeling of contribution to a global effort (M)	Personal professional functioning (DV)	.12*	.01–.22	.45**	.19–.71	.13	–.01–.27	.05*	.001–.15	.18*	.04–.33	.05*

Note: $R^2 = .05$, $F = 6.05$, $p = .02$. The significant statistical effects ($p < .05$ or $p < .01$) are in bold.

* $p < .05$. ** $p < .01$.

(Houghton et al., 2020). Unclear guidelines early in the COVID-19 pandemic are thought to have contributed to lower rates of rehabilitation of COVID-19 survivors after in-hospital invasive mechanical ventilation (Musheyev et al., 2021). The frequently changing guidelines regarding personal protective equipment that were issued in the UK during the COVID-19 pandemic generated confusion and distrust among frontline health care workers (Hoernke et al., 2021). On March 19, 2020, the World Health Organisation issued a guidance called “Coronavirus disease (COVID-19) outbreak: rights, roles, and responsibilities of health workers, including key considerations for occupational safety and health” (WHO, 2020b). Unfortunately, while the guidance included general guidelines, it did not address specific situations. For example, although the responsibility to provide adequate infection prevention and control and personal protection supplies was imposed on employers and managers (WHO, 2020b), in practice, a worldwide lack of personal protective equipment made it impossible to follow the guidelines. This led to a prolonged period of multiple reuse of equipment, in parallel with development of methods for cleaning and disinfecting equipment without knowing its effectiveness, and the use of manually prepared masks that had not passed a quality check (Chua et al., 2020). The uniqueness of the current situation is that since COVID-19 is a new pathogen, guidelines did not exist during the early stages of the pandemic. In similar future scenarios, we would recommend the WHO and national health authorities to publish evidence- and research-based information about the causative agent and to update the defence and care guidelines for health care providers on a regular basis. Furthermore, current practical guidelines updated on the base of existing knowledge and a review of recent studies should be published on a regular schedule for the benefit of health care professionals.

5 | STUDY LIMITATIONS

Among the main limitations is the fact that this was a cross-sectional study, and it is therefore impossible to determine causal relationships. In addition, since the sample was a convenience sample and was relatively small, the results may not necessarily be representative. Specifically, the study was performed in a single medical centre, which may limit the generalization of the current results.

6 | CONCLUSION

The results of the study provide empirical evidence regarding factors associated with personal professional functioning of nurses and physicians in a tertiary general hospital during the COVID-19 pandemic in Israel. A feeling of contribution to a global effort mediated the relationships between work organisation by the management and personal professional functioning. The clarity of guidelines for routine procedures and a feeling of contribution to a global effort positively predicted the personal professional functioning of nurses and physicians.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

In an emergency, it is essential to provide health care workers with clear guidelines, instructions, and standard operating procedures in order to optimize their professional functioning. It may be useful to adapt similar protocols to those employed in ER triage, where all health care workers are aware of their specific responsibilities. Another recommendation is the appointment of a pandemic coordinator whose responsibility would be provide information and support to the health care staff. Moreover, positive actions should be taken to maintain health care workers' feeling of contribution to a global effort, sense of meaning, and morale during an emergency. Specifically, the recommendations for nursing management are to appraise workers of what is happening and provide them with positive feedback and reinforcement. Such workers are likely to maximize their efforts on behalf of their ward and hospital. These actions may help to raise health care staff motivation and improve professional functioning.

ACKNOWLEDGEMENT

Phi Mu Chapter, England (Sigma Theta Tau International).

CONFLICT OF INTEREST

The authors declared no conflict of interest.

ETHICS STATEMENT

The study was approved by the Ethics committee of the Wolfson Medical Center, Holon, Israel, where the study took place (Approval number 0113-20 WOMC).

DATA AVAILABILITY STATEMENT

We allow to share the supporting information.

ORCID

Semyon Melnikov  <https://orcid.org/0000-0002-2545-8435>

REFERENCES

- Baldwin, S., & George, J. (2021). Qualitative study of UK health professionals' experiences of working at the point of care during the COVID-19 pandemic. *BMJ Open*, 11(9), e054377. <https://doi.org/10.1136/bmjopen-2021-054377>
- Bambi, S., Iozzo, P., & Lucchini, A. (2020). New issues in nursing management during the COVID-19 pandemic in Italy. *American Journal of Critical Care*, 29(4), e92–e93. <https://doi.org/10.4037/ajcc2020937>
- Barnett, M. L., & Grabowski, D. C. (2020). Nursing homes are ground zero for COVID-19 pandemic. *JAMA Health Forum*, 1(3), e200369. <https://doi.org/10.1001/jamahealthforum.2020.0369>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. <https://doi.org/10.1037//0022-3514.51.6.1173>
- Brindle, M. E., & Gawande, A. (2020). Managing COVID-19 in Surgical Systems. *Annals of Surgery*, 272(1), e1–e2. <https://doi.org/10.1097/SLA.0000000000003923>
- Cengiz, Z., Isik, K., Gurdap, Z., & Yayan, E. H. (2021). Behaviours and experiences of nurses during the COVID-19 pandemic in Turkey: A mixed methods study. *Journal of Nursing Management*, 29(7), 2002–2013. <https://doi.org/10.1111/jonm.13449>
- Chua, M. H., Cheng, W., Goh, S. S., Kong, J., Li, B., Lim, J. Y. C., Mao, L., Wang, S., Xue, K., Yang, L., Ye, E., Zhang, K., Cheong, W. C. D., Tan, B. H., Li, Z., Tan, B. H., & Loh, X. J. (2020). Face masks in the new COVID-19 normal: Materials, testing, and perspectives. *Research (Washington, D.C.)*, 2020, 7286735. <https://doi.org/10.34133/2020/7286735>
- Dieleman, M., Cuong, P. V., Anh, L. V., & Martineau, T. (2003). Identifying factors for job motivation of rural health workers in North Viet Nam. *Human resources for health*, 1(1), 10. <https://doi.org/10.1186/1478-4491-1-10>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Gao, X., Jiang, L., Hu, Y., Li, L., & Hou, L. (2020). Nurses' experiences regarding shift patterns in isolation wards during the COVID-19 pandemic in China: A qualitative study. *Journal of Clinical Nursing*, 29(21–22), 4270–4280. <https://doi.org/10.1111/jocn.15464>
- Gholami, M., Fawad, I., Shadan, S., Rowaiee, R., Ghanem, H., Hassan Khamis, A., & Ho, S. B. (2021). COVID-19 and healthcare workers: A systematic review and meta-analysis. *International Journal of Infectious Diseases*, 104, 335–346. <https://doi.org/10.1016/j.ijid.2021.01.013>
- Grabowski, D. C., & Mor, V. (2020). Nursing home care in crisis in the wake of COVID-19. *The Journal of the American Medical Association*, 324(1), 23–24. <https://doi.org/10.1001/jama.2020.8524>
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.
- Hendrickson, R. C., Slevin, R. A., Chang, B. P., Sano, E., McCall, C., & Raskind, M. A. (2020). The impact of working during the Covid-19 pandemic on health care workers and first responders: Mental health, function, and professional retention. *MedRxiv*.
- Hoerneke, K., Djellouli, N., Andrews, L., Lewis-Jackson, S., Manby, L., Martin, S., Vanderslott, S., & Vindrola-Padros, C. (2021). Frontline healthcare workers' experiences with personal protective equipment during the COVID-19 pandemic in the UK: a rapid qualitative appraisal. *BMJ Open*, 11(1), e046199. <https://doi.org/10.1136/bmjopen-2020-046199>
- Houghton, C., Meskell, P., Delaney, H., Smalle, M., Glenton, C., Booth, A., Chan, X. H. S., Devane, D., & Biesty, L. M. (2020). Barriers and facilitators to healthcare workers' adherence with infection prevention and control (IPC) guidelines for respiratory infectious diseases: a rapid qualitative evidence synthesis. *Cochrane Database of Systematic Reviews*, 4, CD013582. <https://doi.org/10.1002/14651858.CD013582>
- <https://www.dictionary.com>. (2022a). Guidelines definition. Retrieved March 31, 2022, from <https://www.dictionary.com/browse/guideline>
- <https://www.dictionary.com>. (2022b). Management definition. Retrieved March 31, 2022, from <https://www.dictionary.com/browse/management>
- <https://www.merriam-webster.com>. (2022). Feelings definition. Retrieved March 31, 2022, from <https://www.merriam-webster.com/dictionary/feeling>
- Jetly, R., Vermetten, E., Easterbrook, B., Lanius, R., & McKinnon, M. (2020). Going to “war”: Military approach as the antidote to defeating COVID-19. *Military behavioral health*, 8(3), 243–247. <https://doi.org/10.1080/21635781.2020.1765911>
- Jia, Y., Chen, O., Xiao, Z., Xiao, J., Bian, J., & Jia, H. (2021). Nurses' ethical challenges caring for people with COVID-19: A qualitative study. *Nursing ethics*, 28(1), 33–45. <https://doi.org/10.1177/0969733020944453>
- Medicine, J. H. U. & Johns Hopkins University (2020, April 23). Coronavirus Resource Center. Retrieved April 23, 2020, from <https://coronavirus.jhu.edu/map.html>
- Kagan, I., Itzhaki, M., & Melnikov, S. (2017). Patriotism, organizational commitment and nurses' intention to report for work in emergencies.

- International nursing review*, 64(4), 468–475. <https://doi.org/10.1111/inr.12395>
- Kagan, I., Shor, R., Ben Aharon, I., Yerushalmi, S., Kigli-Shemesh, R., Gelman, S., & Itzhaki, M. (2021). A mixed-methods study of nurse managers' managerial and clinical challenges in mental health centers during the COVID-19 pandemic. *Journal of Nursing Scholarship*, 53(6), 663–670. <https://doi.org/10.1111/jnu.12685>
- Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B. X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, L., Wang, G., Ma, H., & Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *The Lancet. Psychiatry*, 7(3), e14. [https://doi.org/10.1016/S2215-0366\(20\)30047-X](https://doi.org/10.1016/S2215-0366(20)30047-X)
- Kellogg, M. B., Schierberl Scherr, A. E., & Ayotte, B. J. (2021). All of this was awful: Exploring the experience of nurses caring for patients with COVID-19 in the United States. *Nursing forum*, 56(4), 869–877. <https://doi.org/10.1111/nuf.12633>
- Khalid, I., Khalid, T. J., Qabajah, M. R., Barnard, A. G., & Qushmaq, I. A. (2016). Healthcare Workers Emotions, Perceived Stressors and Coping Strategies During a MERS-CoV Outbreak. *Clinical Medicine & Research*, 14(1), 7–14. <https://doi.org/10.3121/cm.2016.1303>
- Krosnick, J. A. (2018). Questionnaire design. In D. L. Vannette & J. A. Krosnick (Eds.), *The palgrave handbook of survey research* (pp. 439–455). Springer International Publishing. https://doi.org/10.1007/978-3-319-54395-6_53
- Lee, N., & Lee, H.-J. (2020). South Korean nurses' experiences with patient care at a COVID-19-designated hospital: Growth after the frontline battle against an infectious disease pandemic. *International Journal of Environmental Research and Public Health*, 17(23). <https://doi.org/10.3390/ijerph17239015>
- Melnikov, S., Blaer, Y., Shaiman, L., Levi, H., & Kagan, I. (2019). To command is to serve: Senior leadership and policy-making predict hospital ward functioning in emergency. *Journal of Nursing Management*, 27(4), 697–705. <https://doi.org/10.1111/jonm.12734>
- Melnikov, S., Shor, R., Kigli-Shemesh, R., Gun Usishkin, M., & Kagan, I. (2013). Closing an open psychiatric ward: organizational change and its effect on staff uncertainty, self-efficacy, and professional functioning. *Perspectives in psychiatric care*, 49(2), 103–109. <https://doi.org/10.1111/ppc.12001>
- Musheyev, B., Borg, L., Janowicz, R., Matarlo, M., Boyle, H., Singh, G., Ende, V., Babatsikos, I., Hou, W., & Duong, T. Q. (2021). Functional status of mechanically ventilated COVID-19 survivors at ICU and hospital discharge. *Journal of intensive care*, 9(1), 31. <https://doi.org/10.1186/s40560-021-00542-y>
- Nowell, L., Dhingra, S., Andrews, K., & Jackson, J. (2021). A grounded theory of clinical nurses' process of coping during COVID-19. *Journal of Clinical Nursing*. <https://doi.org/10.1111/jocn.15809>
- Okediran, J. O., Ilesanmi, O. S., Fetuga, A. A., Onoh, I., Afolabi, A. A., Ogunbode, O., Olajide, L., Kwaghe, A. V., & Balogun, M. S. (2020). The experiences of healthcare workers during the COVID-19 crisis in Lagos, Nigeria: A qualitative study. *Germes*, 10(4), 356–366. <https://doi.org/10.18683/germes.2020.1228>
- Park, S. Y., Kim, B., Jung, D. S., Jung, S. I., Oh, W. S., Kim, S.-W., Peck, K. R., & Chang, H.-H. (2020). Psychological distress among infectious disease physicians during the response to the COVID-19 outbreak in the Republic of Korea. *BMC Public Health*, 20(1), 1–7.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Rattray, J., & Jones, M. C. (2007). Essential elements of questionnaire design and development. *Journal of Clinical Nursing*, 16(2), 234–243. <https://doi.org/10.1111/j.1365-2702.2006.01573.x>
- Robert, R., Kentish-Barnes, N., Boyer, A., Laurent, A., Azoulay, E., & Reignier, J. (2020). Ethical dilemmas due to the Covid-19 pandemic. *Annals of intensive care*, 10(1), 84. <https://doi.org/10.1186/s13613-020-00702-7>
- Sahu, A., & Srivastava, K. B. (2017). Antecedents and consequences of positive emotions in the workplace. *International Journal of Work Organisation and Emotion*, 8(2), 99–117. <https://doi.org/10.1504/IJWOE.2017.086428>
- Sheng, Q., Zhang, X., Wang, X., & Cai, C. (2020). The influence of experiences of involvement in the COVID-19 rescue task on the professional identity among Chinese nurses: A qualitative study. *Journal of Nursing Management*, 28(7), 1662–1669. <https://doi.org/10.1111/jonm.13122>
- Sun, N., Wei, L., Shi, S., Jiao, D., Song, R., Ma, L., Wang, H., Wang, C., Wang, Z., You, Y., Liu, S., & Wang, H. (2020). A qualitative study on the psychological experience of caregivers of COVID-19 patients. *American Journal of Infection Control*, 48(6), 592–598. <https://doi.org/10.1016/j.ajic.2020.03.018>
- Thefreedictionary.com, T. co. (2014). Functioning definition. Retrieved March 31, 2022, from <https://www.thefreedictionary.com/functioning>
- Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: a tale of two facets. *Journal of Personality and Social Psychology*, 92(3), 506–525. <https://doi.org/10.1037/0022-3514.92.3.506>
- van Sonderen, E., Sanderman, R., & Coyne, J. C. (2013). Ineffectiveness of reverse wording of questionnaire items: Let's learn from cows in the rain. *Plos One*, 8(7), e68967. <https://doi.org/10.1371/journal.pone.0068967>
- Vincent, J.-L., & Creteur, J. (2020). Ethical aspects of the COVID-19 crisis: How to deal with an overwhelming shortage of acute beds. *European heart journal. Acute cardiovascular care*, 9(3), 248–252. <https://doi.org/10.1177/2048872620922788>
- Vindrola-Padros, C., Andrews, L., Dowrick, A., Djellouli, N., Fillmore, H., Bautista Gonzalez, E., Javadi, D., Lewis-Jackson, S., Manby, L., Mitchinson, L., Mulcahy Symmons, S., Martin, S., Regenold, N., Robinson, H., Sumray, K., Singleton, G., Syversen, A., Vanderslott, S., & Johnson, G. (2020). Perceptions and experiences of healthcare workers during the COVID-19 pandemic in the UK. *BMJ Open*, 10(11), e040503. <https://doi.org/10.1136/bmjopen-2020-040503>
- Weidman, A. C., Tracy, J. L., & Elliot, A. J. (2016). The benefits of following your pride: authentic pride promotes achievement. *Journal of Personality*, 84(5), 607–622. <https://doi.org/10.1111/jopy.12184>
- WHO. (2020a, March 11). WHO director-general's opening remarks at the media briefing on COVID-19-11 March 2020. Retrieved August 26, 2021, from <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19--11-march-2020>
- WHO. (2020b). Coronavirus disease (COVID-19) outbreak: Rights, roles and responsibilities of health workers, including key considerations for occupational safety and health: interim guidance, 19 March 2020.
- WHO. (2021). The impact of COVID-19 on health and care workers: A closer look at deaths. Retrieved from https://apps.who.int/iris/handle/10665/345300?locale-attribute=ar&utm_medium=miragenews&utm_campaign=news&utm_source=miragenews
- Wu, X., Zheng, S., Huang, J., Zheng, Z., Xu, M., & Zhou, Y. (2020). Contingency nursing management in designated hospitals during COVID-19 outbreak. *Annals of global health*, 86(1), 70. <https://doi.org/10.5334/aogh.2918>
- Xu, H., Intrator, O., & Bowblis, J. R. (2020). Shortages of staff in nursing homes during the COVID-19 pandemic: What are the driving factors? *Journal of the American Medical Directors Association*, 21(10), 1371–1377. <https://doi.org/10.1016/j.jamda.2020.08.002>
- Zhang, X., Noor, R., & Savalei, V. (2016). Examining the effect of reverse worded items on the factor structure of the need for cognition scale. *Plos One*, 11(6), e0157795. <https://doi.org/10.1371/journal.pone.0157795>

Zhao, S., Yin, P., Xiao, L. D., Wu, S., Li, M., Yang, X., Zhang, D., Liao, L., & Feng, H. (2021). Nursing home staff perceptions of challenges and coping strategies during COVID-19 pandemic in China. *Geriatric nursing (New York, N.Y.)*, 42(4), 887–893. <https://doi.org/10.1016/j.gerinurse.2021.04.024>

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Melnikov, S., Fridman, S., Aboav, A., Moore, F., & Cohen, Y. (2022). Factors affecting the professional functioning of health care workers during the COVID-19 pandemic: A cross-sectional study. *Journal of Nursing Management*, 30(5), 1157–1167. <https://doi.org/10.1111/jonm.13629>