


# Complementary and integrative medicine intervention in front-line COVID-19 clinicians

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Received 18 August 2021  
Accepted 8 March 2022

## ABSTRACT

**Objective** To assess the impact of a multidisciplinary complementary and integrative medicine (CIM) intervention on physical and emotional concerns among front-line COVID-19 healthcare providers (HCPs).

**Methods** A multimodality CIM treatment intervention was provided by integrative practitioners to HCPs in three isolated COVID-19 departments. HCPs' two main concerns were scored (from 0 to 6) before and following the CIM intervention using the Measure Yourself Concerns and Wellbeing questionnaire. Postintervention narratives identified reflective narratives specifying emotional and/or spiritual keywords.

**Results** Of 181 HCPs undergoing at least one CIM treatment, 119 (65.7%) completed post-treatment questionnaires. While HCPs listing baseline emotional-related concerns benefited from the CIM intervention, those who did not express emotional or spiritual concerns improved even more significantly following the first session, for both leading concerns ( $p=0.038$ ) and emotional-related concerns ( $p=0.023$ ). Nevertheless, it was shown that following subsequent treatments HCPs who expressed emotional and spiritual concerns improved more significantly than those who did not for emotional-related concerns ( $p=0.017$ ).

**Conclusions** A CIM intervention for front-line HCPs working in isolated COVID-19 departments can significantly impact emotional-related concerns, more so after the first treatment and among HCPs not using emotional-spiritual keywords in post-treatment narratives. Referral of HCPs to CIM programmes for improved wellbeing should avoid referral bias to those not expressing emotional/spiritual concerns.

## INTRODUCTION

The current COVID-19 pandemic has created a number of challenges to healthcare providers (HCPs) across the globe.

## Key messages

### What was already known?

- ▶ Front-line COVID-19 healthcare providers report physical/emotional concerns.

### What are the new findings?

- ▶ Complementary and integrative medicine treatments reduced healthcare provider-reported emotional-related distress.
- ▶ Healthcare practitioners not expressing emotional-spiritual keywords showed greater response to these treatments.

### What is their significance?

- ▶ Healthcare directors should consider providing complementary and integrative medicine to COVID-19 healthcare practitioners aiming to improve their emotional concerns.
- ▶ Future research needs to examine the impact of integrative medicine intervention on burnout/resilience among healthcare providers.

These include the need for hospitals to quickly assemble multidisciplinary teams of HCPs from a wide range of clinical departments, while addressing the strain placed on available resources and staff.<sup>1</sup> The need for a quick response and the uncertainty of its success have been compared with a 'battlefield', with significant psychosocial impact on clinical and non-clinical staff.<sup>2</sup> Psychological morbidity seen among front-line COVID-19 HCPs ranges from emotional exhaustion and distress, to depression, anxiety, burnout, post-traumatic stress and inadequate sleep.<sup>3 4</sup> The constant need to wear personal protective equipment has created its own challenges, making communication with patients and other staff members extremely difficult. This has led to an exacerbation of feelings of isolation among COVID-19 HCPs,



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**To cite:** Ben-Arye E, Gressel O, Samuels N, et al. *BMJ Supportive & Palliative Care* Epub ahead of print: [please include Day Month Year]. doi:10.1136/bmjspcare-2021-003333

who have also experienced diminished social support, with increased rates of burnout and depression.<sup>5,6</sup>

In order to address these challenges, especially emotional-related concerns, distress and burnout, many hospitals have been directing resources to address issues such as job protection, communication about ensuring a safe COVID-19 environment, personal protective equipment and professional counselling services, which in many cases have been found to be underutilised.<sup>7</sup> In order to overcome the need for social distancing in these departments, many counselling programmes have moved to an online format.<sup>8</sup> Finally, many hospitals are providing complementary and integrative medicine (CIM) programmes to COVID-19 workers, with a significant beneficial effect found with mind-body modalities in alleviating anxiety, stress and insomnia among this HCP population.<sup>9,10</sup>

The present study sets out to examine the impact of an HCP-tailored CIM intervention designed to address emotional and physical concerns among HCPs and other personnel working in three isolated COVID-19 departments in a hospital in northern Israel. HCP narratives were searched for emotional and/or spiritual keywords in order to assess the impact of the CIM intervention on this aspect of care.

## METHODS

### Study design

The study was designed within a prospective, participant-preference format. It was considered to be unethical to randomly assign HCPs to a non-treated control arm in light of the intensity of the clinical setting in which front-line COVID-19 HCPs are working on a daily basis.

### Primary study outcome

The primary study outcome was the impact of the CIM intervention on the quality of life of the study participants, focusing predominantly on the two most significant concerns, especially emotional-related issues.

### Study setting

The study took place in three isolated COVID-19 departments at Carmel Medical Center in Haifa, Israel, during a 10-week outbreak immediately following the national COVID-19 immunisation initiative in February 2021. The study participants were clinical and non-clinical personnel working in isolated COVID-19 departments, one of which served as an intensive care unit. HCPs and non-clinical personnel working in the three COVID-19 departments were referred by the hospital administration and the departments' senior physicians and nurses to an initial consultation with an integrative physician, a medical doctor dually trained in integrative medicine and supportive care. The 10 min consultation with an integrative physician took place in a room adjacent to the COVID-19

departments, outside the isolation area, during which the study format was described in detail. Following signing of the study informed consent form, the integrative physician and the study HCP codefined the two most significant concerns to be addressed during the CIM treatment programme. Sessions lasted 30 min and included at least two of the following modalities: acupuncture, mind-body therapies (eg, relaxation and breathing) and touch-movement modalities (eg, reflexology, acupressure, anthroposophic medicine, qi gong and Feldenkrais method). Each CIM session was followed by a brief follow-up assessment of the concerns addressed, with reflections on the experience and impact on well-being.

CIM consultations and treatments were provided by nine CIM-trained personnel (two physicians, two nurses and five therapists) from the Integrative Oncology Program, who had until then been providing CIM supportive and palliative care to patients undergoing chemotherapy at Clalit Health Services Oncology Service (Lin, Zebulun and Carmel medical centres in Haifa, Israel). The CIM team underwent 6 hours of special training in preparation for working in an isolated COVID-19 setting. This included instruction on infection-related preventive measures; learning about CIM research being conducted in COVID-19 departments in China, Italy and Israel; and sharing case studies with CIM-trained colleagues who had launched a parallel CIM project in COVID-19 departments at Bnai Zion Medical Center, Haifa, Israel. In addition to treating COVID-19 HCPs and personnel, CIM was also provided to patients hospitalised in these departments by four CIM personnel (two physicians and two therapists), addressing their concerns and well-being as well. All CIM personnel were able to attend daily debriefing sessions in the departments, sharing their reflections and experiences, with the goal of promoting resilience and facilitating a learning process to be implemented in subsequent CIM sessions. Staff meetings were also attended by a social worker who, together with the CIM team, was then able to provide guidance to CIM practitioners in the treatment of patients and staff.

### Assessment of HCP concerns

Assessment of HCP concerns was conducted during the initial CIM consultation and at the end of each subsequent CIM session using the Measure Yourself Concerns and Wellbeing (MYCAW) questionnaire. The MYCAW is composed of a Likert-like questionnaire which asks patients to list their two main concerns, scoring them from 0 (of no concern) to 6 (of greatest concern). Patients are also asked to score their general feeling of well-being (0, as good as it could be; 6, as bad as it could be). At follow-up visits, patients are asked to answer two open-ended questions about 'other issues related to your health' and 'what has been the most important issue for you?'<sup>11</sup>

In the present study, the MYCAW questionnaire was used to assess the impact of the CIM programme on participating HCPs working in the COVID-19 department. Preintervention physician-administered questionnaires asked participants to list their two most significant concerns, while acknowledging the therapeutic setting ('Please write down one or two concerns or problems which you would most like us to help you with'). They were then asked to score the two concerns and their 'general feeling of wellbeing' from 0 (not bothering me at all) to 6 (bothers me greatly), while emphasising a subjective context ('bothering') rather than an objective symptom intensity. At each post-CIM assessment, HCPs were asked to rescore the two leading concerns and well-being, as well as complete two additional open-ended questions about their experience during and following the CIM session. These reflections were considered short narratives and were qualitatively analysed.

#### Data analysis

Statistical analyses were conducted using the IBM SPSS Statistics V.24.0 program, with mean and SD or median and IQR for continuous variables, and numbers and proportions for categorical variables.

Demographic traits of the study cohort were analysed in accordance with use (or non-use) of emotional and spiritual keywords, which included terms such as 'calming', 'release', 'relaxation' and 'disengagement', at post-treatment assessment. Identification of these keywords was conducted through a qualitative analysis, using ATLAS.Ti software for systematic coding of MYCAW free-text narratives provided by the HCPs following the CIM treatment.<sup>12</sup> In the present study, the use of these keywords in HCP narratives was considered an independent variable reflecting a willingness to share emotional experience, and not just the response to a specific outcome. Demographic and clinical characteristics of both groups (HCPs using vs not using the keywords) were analysed using  $\chi^2$  test (for categorical variables) and an independent t-test/Mann-Whitney for continuous variables. Within-group differences between pre-CIM and post-CIM treatment assessments were analysed for the two leading concerns listed on the study questionnaire, for specific groups of concerns (eg, fatigue, emotional distress, pain) and for well-being scores, using Wilcoxon signed-rank test for each group separately. Prescore to postscore differences between groups were analysed using Mann-Whitney test.

A multivariate logistic regression model was designed following a univariate analysis, where variables with  $p < 0.1$  were included (age, mentioning an emotional concern at baseline assessment and undergoing acupuncture treatment) to predict the associations between use of emotional-spiritual keywords and demographic and treatment-related characteristics. Additional logistic regression analysis was performed

to predict improvement in severity scores (at least 2 points on the questionnaire, on a scale ranging from 0 to 6) among HCPs attending the first CIM session. In patients reporting two concerns at baseline, improvement was considered only if both concerns had improved by at least 2 points.

Participation in the study was voluntary, with no incentives offered such as payments or the like. All participating HCPs gave written consent.

## RESULTS

### Description of the study group

Of the 299 HCPs and personnel working in the three COVID-19 departments, 181 provided written consent and underwent at least one CIM treatment. Of these, 105 (58%) attended only a single session (181 sessions), with 76 attending between 2 and 8 sessions (124 sessions), for a total of 305 CIM sessions. The study cohort included the following professional characteristics: 57 physicians, 90 nurses, 17 adjuvant personnel (eg, administration, cleaning), 11 technicians (eg, respiratory, X-ray) and 6 paramedical practitioners (eg, physiotherapists, occupational therapists, social workers). The cohort was of a diverse social-cultural-religious make-up, with majority of HCPs reporting Arabic as their primary language (47.2%), followed by Hebrew (29%) and Russian (22.7%). Only 2 of 181 participants met with a social worker during the study period, although this service was available and recommended by the hospital administration in order to enable them to express their concerns in a non-formal or psychotherapeutic setting.

Of the cohort of 181 HCPs, 119 (65.7%) were found to use emotional-spiritual keywords in their post-treatment narratives (table 1). Both groups had similar baseline demographic and clinical-related characteristics, although HCPs in the group using the keywords were younger ( $p=0.002$ ), less likely to be physicians or nurses ( $p=0.032$ ) and more likely to list emotional concerns at their baseline questionnaire assessment ( $p=0.001$ ). When compared with the group not using the keywords, a multivariate logistic regression analysis indicated that HCPs who used the keywords were more likely to include emotional concerns at their baseline assessment (OR: 2.63 (95% CI 1.36 to 5.1),  $p=0.004$ ).

### Integrative medicine modalities

Patients in the group using the keywords were most likely to be treated with acupuncture ( $p=0.019$ ), with the other CIM modalities equally distributed between the two study groups. Less than half (42%) of HCPs received only one modality during the first CIM session, with the rest undergoing as many as four treatment modalities concurrently. Safety-related issues associated with the CIM intervention were documented during and following each intervention. Only a small number of adverse effects were reported,

**Table 1** Comparison of healthcare practitioners undergoing CIM treatments using emotional-spiritual keywords\* in their reflective narratives and those who did not

Characteristics	Total cohort N=181	Not using the keywords n=62	Using the keywords n=119	P value
<b>Age</b>				
Mean±SD (median)	36.8±9.5	39.7±10.3	35.2±8.7	0.002
<b>Gender/sex</b>				
Female	109 (60.2)	41 (66.1)	68 (57.1)	0.241
<b>Primary language</b>				
Hebrew	51 (29.0)	14 (23.3)	37 (31.9)	0.235
Arab	83 (47.2)	31 (51.7)	52 (44.8)	0.389
Russian	40 (22.7)	15 (25.0)	25 (21.6)	0.647
Other	2 (1.1)	0	2 (1.7)	
<b>Familial status</b>				
Single	65 (36.1)	18 (29.0)	47 (39.8)	0.152
<b>Residence</b>				
Haifa	66 (39.1)	18 (32.7)	48 (42.1)	0.242
<b>Profession</b>				
Physician	57 (31.5)	14 (22.6)	43 (36.1)	0.062
Nurse	90 (49.7)	31 (50.0)	59 (49.6)	0.957
Other	34 (18.8)	17 (27.4)	17 (14.3)	0.032
<b>Original department</b>				
Internal medicine	82 (54.7)	24 (49.0)	58 (57.4)	0.330
ICU	37 (24.7)	14 (28.6)	23 (22.8)	0.440
Others	31 (20.7)	11 (22.4)	20 (19.8)	0.707
<b>Weekly hours in COVID-19</b>				
Mean±SD (median)	40.4±15.7	39.1±13.0	41.1±17.0	0.428
<b>Ever diagnosed with COVID-19?</b>				
Yes	8 (16.1)	7 (11.3)	21 (17.6)	0.262
<b>Prior CAM use</b>				
Yes	95 (52.5)	35 (56.5)	60 (50.4)	0.441
<b>Referral source</b>				
Secretary	87 (66.9)	27 (69.2)	60 (65.9)	0.714
Physician	30 (23.1)	10 (25.6)	20 (22.0)	0.650
Nurse	13 (10.0)	2 (5.1)	11 (12.1)	0.342
<b>Leading concerns at baseline</b>				
Emotional	119 (65.7)	31 (50.0)	88 (73.9)	0.001
Pain	102 (56.4)	39 (62.9)	63 (52.9)	0.200
Fatigue	72 (39.8)	30 (48.4)	42 (35.3)	0.088
Insomnia	16 (8.8)	4 (6.5)	12 (10.1)	0.414
Dyspnoea	6 (3.3)	4 (6.5)	2 (1.7)	0.183
Gastrointestinal	4 (2.2)	1 (1.6)	3 (2.5)	0.99
<b>Baseline well-being</b>				
Mean±SD (median)	2.51±1.3	2.46±1.4	2.54±1.3	0.848
<b>Number of IM treatments</b>				
Only 1 (vs >1)	76 (42.0)	25 (40.3)	51 (42.9)	0.743
<b>Integrative modalities practised during the first session</b>				

Continued

**Table 1** Continued

Characteristics	Total cohort	Not using the keywords	Using the keywords	P value
	N=181	n=62	n=119	
Touch-movement	167 (94.4)	58 (95.1)	109 (94.0)	0.99
Acupuncture	137 (77.4)	41 (67.2)	96 (82.8)	0.019
Mind-body	105 (59.3)	33 (54.1)	72 (62.1)	0.305
Anthroposophic medicine	41 (23.3)	15 (24.6)	26 (22.7)	0.448

\*Based on the Measure Yourself Concerns and Wellbeing (MYCAW) questionnaire.

CAM, Complementary and Alternative medicine; CIM, complementary and integrative medicine; ICU, Intensive Care Unit; IM, Integrative Medicine.

including local discomfort during acupuncture needle insertion and a temporary experience of difficulty relaxing at the beginning of mind-body interventions, which resolved shortly after.

#### HCPs' concerns: assessment following first CIM treatment

The 181 HCPs undergoing the first CIM session listed a total of 340 concerns on their questionnaires, of which 292 were available for a pre-to-post treatment assessment. At baseline, patients in the group not using the keywords specified 90 concerns, while those using the keywords listed 202 concerns. HCPs in both groups had similar severity scores in their two leading baseline concerns (table 2), including fatigue, emotional, pain and well-being. Baseline-to-post CIM treatment scores improved significantly within the

two groups for all concerns. However, patients not using the keywords improved more significantly in their overall scores for the two leading concerns on the questionnaire ( $p=0.038$ ), as well as for emotional concerns ( $p=0.023$ ). A multivariate logistic regression analysis indicated that improvement in scores for the specified concerns was associated more significantly with previous use of complementary medicine (OR: 2.51 (95% CI 1.003 to 6.26),  $p=0.049$ ), but not with expression of emotional/spiritual keywords ( $p=0.565$ ).

#### HCPs' concerns: assessment following subsequent CIM treatments

The 76 HCPs undergoing additional CIM treatment sessions (range: 2–8, total 124 sessions) listed 223 leading concerns on their questionnaires, of which

**Table 2** Impact of the CIM programme before and after the first treatment: comparing HCPs using versus those not using emotional-spiritual keywords

Parameter	Pretreatment assessment	Post-treatment assessment	Pretreatment assessment	Post-treatment assessment	P value*
	Score, mean±SD (median)		Score, mean±SD (median)		
<b>HCPs reporting MYCAW† concerns during the first IM session</b>					
	<b>Not using keywords n=62</b>		<b>Using keywords n=119</b>		
Two leading MYCAW concerns scores	n=90‡ 4.307±1.2 4 (3, 5)	n=90 1.67±1.6 1.5 (0, 3)	n=202 4.40±1.1 4 (4, 5)	n=202 2.0±1.4 2 (1, 3)	P <sup>1</sup> =0.444, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.038
Fatigue score	n=24 4.08±1.1 4 (3, 5)	n=24 1.95±1.8 2 (0, 3)	n=38 4.50±0.98 4 (4, 5)	n=38 2.18±1.4 2 (1, 3)	P <sup>1</sup> =0.122, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.389
Emotional score	n=25 4.84±1.1 5 (4, 6)	n=25 1.28±1.5 1 (0, 2)	n=81 4.48±1.1 5 (4, 5)	n=81 2.0±1.5 2 (1, 3)	P <sup>1</sup> =0.147, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.023
Pain score	n=33 4.06±1.3 4 (3, 5.5)	n=33 1.69±1.4 2 (0, 3)	n=54 4.09±1.08 4 (3, 5)	n=54 1.89±1.3 2 (1, 3)	P <sup>1</sup> =0.717, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.484
Well-being score	n=24 2.50±1.5 3 (1, 3.75)	n=24 0.92±1.18 1 (0, 1)	n=59 2.81±1.2 3 (2, 4)	n=59 1.36±1.2 0 (1, 2)	P <sup>1</sup> =0.871, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.616

\*P values are presented with the following comparisons between groups: P<sup>1</sup>= comparison between those using vs. not using emotional-spiritual keywords for baseline scores; P<sup>2</sup>= comparison between those using vs. not using keywords for within-group score changes, from baseline to post-CIM treatment assessment; P<sup>3</sup>= comparison between those using vs. not using keywords for within-group score changes from baseline to post-CIM treatment assessment; P<sup>4</sup>= comparison between those using vs. not using keywords for group changes from baseline to post-CIM treatment assessment

†The MYCAW questionnaire scores the two most significant concerns, ranging from 0 (not bothering me at all) to 6 (bothers me greatly).

‡n is the number of MYCAW concerns reported by HCPs.

CIM, complementary and integrative medicine; HCPs, healthcare providers; MYCAW, Measure Yourself Concerns and Wellbeing.



**Table 3** Impact of the CIM programme before and after subsequent (2–8) treatment sessions: comparing HCPs using versus not using emotional-spiritual keywords

Parameter	Pretreatment assessment	Post-treatment assessment	Pretreatment assessment	Post-treatment assessment	P value*
	Score, mean±SD (median)		Score, mean±SD (median)		
	<b>HCPs reporting MYCAW† concerns during the second to eighth IM sessions n=76</b>				
	<b>HCPs not using keywords</b>		<b>HCPs using keywords</b>		
Two leading MYCAW concerns scores	n=124‡ 4.4±1.7 4 (3, 5)	n=124 2.14±1.4 2 (1, 3)	n=73 4.0±1.3 4 (3, 5)	n=73 1.56±1.3 1 (0, 2.5)	P <sup>1</sup> =0.055, P <sup>2</sup> <0.0001, P <sup>3</sup> =0.006, P <sup>4</sup> =0.005
Fatigue score	n=26 4.42±1.2 4 (3, 6)	n=26 2.73±1.6 2.5 (1.7, 4)	n=9 4.11±1.6 4 (3, 5.5)	n=9 1.78±1.4 2 (0.5, 3)	P <sup>1</sup> =0.753, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.138
Emotional score	n=46 4.52±1.2 5 (3.75, 6)	n=46 2.02±1.2 2 (1, 3)	n=27 4.22±1.3 4 (3, 5)	n=27 1.3±1.4 1 (0, 2)	P <sup>1</sup> =0.351, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.017
Pain score	n=47 4.23±1.1 4 (3, 5)	n=47 1.83±1.3 2 (1, 3)	n=31 3.84±1.3 4 (3, 5)	n=31 1.74±1.4 2 (0, 3)	P <sup>1</sup> =0.222, P <sup>2</sup> <0.0001, P <sup>3</sup> <0.0001, P <sup>4</sup> =0.773
Well-being score	n=41 3.15±1.4 3 (2, 4)	n=41 1.71±1.3 2 (1, 2.5)	n=23 2.57±1.5 2 (1, 3)	n=23 1.43±1.2 1 (1, 2)	P <sup>1</sup> =0.121, P <sup>2</sup> <0.0001, P <sup>3</sup> =0.003, P <sup>4</sup> =0.397

\*P values are presented with the following comparisons between the groups: P<sup>1</sup>: comparison between those using versus not using emotional-spiritual keywords for baseline scores; P<sup>2</sup>: comparison between those using versus not using keywords for within-group score changes from baseline to post-CIM treatment assessment; P<sup>3</sup>: comparison between those using versus not using keywords for within-group score changes from baseline to post-CIM treatment assessment; P<sup>4</sup>: comparison between those using versus not using keywords for group changes from baseline to post-CIM treatment assessment.

†The MYCAW questionnaire scores the two most significant concerns, ranging from 0 (not bothering me at all) to 6 (bothers me greatly).

‡n is the number of MYCAW concerns reported by HCPs.

CIM, complementary and integrative medicine; HCPs, healthcare providers; MYCAW, Measure Yourself Concerns and Wellbeing.

197 were available for pre-to-post treatment assessment (124 from the group not using the keywords; 73 from those who did). The two groups had similar scores for their two leading concerns at baseline (table 3), including fatigue, emotional, pain and well-being scores. As with scores following the first CIM session, baseline-to-post CIM treatment scores improved significantly for all concerns during subsequent (2–8) treatment sessions. However, in contrast to the post-treatment assessment following the first session, patients using the keywords showed a more significant improvement in subsequent CIM sessions for both the two leading concerns ( $p=0.005$ ) and for emotional-related concerns ( $p=0.017$ ).

## DISCUSSION

The present study explored the impact of a CIM treatment programme on the concerns and well-being of front-line HCPs and personnel working in three isolated COVID-19 departments. The study setting presents intense physical and emotional challenges to a medical team working in suboptimal conditions, with the need to communicate with patients despite cumbersome protective gear, work with inorganic teams created from diverse departments in the hospital, with limited knowledge and treatment options for the virus and its complications, and being exposed to a real risk of infection with the COVID-19 virus from

the medical team and others working in this environment.<sup>13 14</sup> A setting such as this would not seem to be one in which a short (30 min) CIM intervention would be of any beneficial effect, especially since treatments would need to take place in this isolated and stressful environment, requiring the IM staff to work within the same conditions as the COVID-19 staff and during the intensive hours of the work shift.

Despite these challenges, the results of the study indicate a significant improvement in baseline-to-post CIM treatment for the two leading concerns and well-being, including for specific concerns such as fatigue, emotional-related concerns or pain. The impact of the CIM programme may reflect non-specific effects (eg, the ability to take a short rest during the work shift, in a relatively peaceful setting, in a supportive environment, with the ability to address their ‘moral injury’),<sup>15</sup> as well as specific effects resulting from the direct impact of the intervention. It is of interest to note that following the first CIM session HCPs who did not use the keywords not only showed greater improvement in their two leading concerns, but also in their emotional-related scores. This is in contrast to subsequent (2–8) sessions, during which HCPs who did not use the keywords improved less significantly than those in the group who did, for both the two leading concerns as well as emotional-related concerns.

A number of explanations could be given for this change in the impact of the CIM programme. To begin with, it is possible that HCPs who did not use the keywords showed greater improvement in their concerns following the first CIM session as a result of a specific effect, which for this group of HCPs decreased in subsequent sessions. It is, however, more likely that HCPs who did not use the keywords were initially unaware or unwilling to share their emotional/spiritual narratives with an unfamiliar integrative physician and experienced a more pronounced therapeutic effect during the first visit. The significant in-between group baseline-to-post session change in this group of respondents may reflect the impact of the CIM intervention among participants who did not verbalise their emotional experience, who in 'normal' conditions would not experience CIM treatments, at least not in a hospital personnel setting.

The change created by this experience appeared to be more dramatic among those who were limited in their ability to use expressive keywords. It is thus possible that HCPs who did not use the keywords may have been less 'in touch' with their emotional-related concerns and were thus more impacted by the first encounter with the CIM intervention. However, as motives for undergoing CIM treatments have been found to change from the initial session to subsequent treatments (eg, values and ideology),<sup>16</sup> here too the pronounced effect may have changed. As a result, in subsequent treatment sessions, the group that used the keywords were more likely to attend these sessions and more consistent in their response to these treatments, with a greater impact of the therapeutic process.

The present study also highlights the association between prior use of complementary medicine and a proclivity towards these practices, which may have influenced the referral of the HCPs to such treatments.<sup>17–20</sup> In the present study, previous use of complementary medicine was similar (about 50%) in both groups. However, it is likely that this prior experience took place in a much less intense and restrictive environment than that of the isolated COVID-19 department. It is possible that encouragement by the hospital administration, as well as the opportunity to have a 'break', may have encouraged even sceptical HCPs to experience at least one CIM session. This might explain why of the 181 HCPs undergoing the first CIM session, only 76 continued with further treatments.

The findings of the present study have important implications for planning of future research examining interventions with the goal to address HCP concerns, increase resilience and prevent burnout with CIM interventions. The findings suggest the need to be less judgemental and selective in recruiting participants in order to address a potential referral bias based on the interest in, openness to and experience with complementary medicine. It is possible that HCPs may not

express an initial interest in participating in a CIM programme, as is the case participation in psychosocial consultations provided to COVID-19 staff.<sup>21 22</sup> In 2020, Pollock *et al*<sup>23</sup> published a Cochrane meta-analysis reviewing the interventions supporting the resilience and mental health of front-line HCPs, concluding that these HCPs may not be fully aware of what they needed to support their mental well-being. The present study found limited use of an available social worker consultation, with CIM shown as a potential option to enrich the spectrum of psychoemotional and spiritual support, serving as a bridge to overcome barriers to the implementation of other interventions. Research on this potential has demonstrated the feasibility and effectiveness of mind-body and breathing therapies (eg, yoga,<sup>24</sup> mindfulness-based intervention<sup>25 26</sup>) in decreasing stress and augmenting resilience among HCPs.

The present study has a number of methodological limitations which need to be addressed in future research. First and foremost, the pragmatic approach entailed the absence of a control group. A control group could, in theory, comprise HCPs not undergoing CIM, but passively given a 30 min rest period or actively undergoing a psychosocial consultation, for example. However, as stated, it was considered unethical and impractical to randomly deny participants access to the CIM treatment. As such, the lack of a control group reflected commitment to the welfare of front-line HCPs, an aspect of the study recognised in the reflective narratives and analysed qualitatively in a separate presentation of the study.

Another study limitation is the risk of referral bias, including selection bias in which HCPs with a proclivity to complementary medicine may have been referred more frequently to the CIM programme, whereas more sceptical HCPs were not. This potential bias may have, however, been offset by the active referral of all COVID-19 HCPs and other staff to the CIM programme by the hospital administration, as well as the proximity of the intervention to the COVID-19 department.

The decision to designate keywords such as 'calming', 'release', 'relaxation' and 'disengagement' as emotional-spiritual keywords was based on an earlier qualitative study which analysed HCP narratives following a CIM treatment programme.<sup>12</sup> Qualitative research exploring patients' experience following CIM treatments has supported the use of similar keywords.<sup>27 28</sup> Still, the use of 'emotional-spiritual keywords' has not, to the best of our knowledge, been reported in the literature with respect to the CIM treatment experience. As such, the decision in the present study to include specific keywords in this category remains to be shown as a valid methodological approach.

In the present study, comparison between HCPs using and not using the keywords is a qualitative-based parameter that was defined at postintervention assessment. This outcome served as a marker of

a verbal expressive trait, rather than as an effectiveness outcome. Finally, the present study took place in a single hospital, which despite the rich diversity of the demographic and social-cultural characteristics of participating HCPs may not be applicable to other sites and settings. Future research will need to explore the generalisability of the CIM intervention.

In conclusion, front-line HCPs working in isolated COVID-19 departments report improved concerns, including emotional distress and well-being, following an HCP-tailored CIM treatment programme. The study supports the feasibility of offering CIM to HCPs who are working in extremely challenging and stressful clinical settings, regardless of their experience or use of emotional-spiritual keywords. Directors of these healthcare settings should be encouraged to refer their personnel to CIM services with the goal of improving their quality of life-related concerns. Future research will need to explore the impact of the CIM programme on additional parameters such as prevention of burnout and enhancement of resilience among HCPs.

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**Acknowledgements** We are grateful to Dr Avi Goldberg MD, Director of Carmel Medical Center, and Shani Brosh, Ahuva Tal and Keren Marom, for their unlimited support; the medical personnel of the three COVID-19 departments at the Carmel Medical Center; Professor Elad Schiff MD and the integrative medicine team at Bnai Zion Medical Center in Haifa, Israel for sharing their insights regarding the pilot design of integrative medicine intervention in their hospital; and the integrative medicine teams at the Lin, Zebulun and Carmel medical centres, who despite the risk agreed to treat patients and medical personnel at the COVID-19 departments: Dafna Wolf, Avigail Sagi, Sagi Shalev, Galit Galil, Dana Goldenblum, Raviv Peleg and Meital Manches.

**Contributors** EB-A, OG and SK planned the trial. EB-A, OG, AE and SK conducted the study and collected the data analysed in the study. EB-A, NSa and NSt carried out the analysis and wrote the draft manuscript. All authors participated in the revision of the manuscript. EBA is responsible for the overall content as the guarantor. EBA (the guarantor) accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Ethics approval** This study involves human participants and was approved by Carmel Medical Center Ethics Committee (Helsinki Committee; CMC-20-0202) in Haifa, Israel.

Participants gave informed consent to participate in the study before taking part.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available upon reasonable request.

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