NEW EDUCATIONAL METHOD

Mindful Caring: A pilot study of an online mindfulness workshop for medical students to improve self-compassion

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Abstract
Background: This study examines the effectiveness of a pilot Mindful Caring workshop in improving self-compassion, mindfulness, and empathy, while reducing stress.
Methods: Clinical-year medical students from the National University of Singapore underwent 16 hours of online workshops over 4 days with didactic and experiential teachings on self-compassion and mindfulness. Primary outcomes of self-compassion and mindfulness were measured with the Self-Compassion Scale (SCS) and the Five Facet Mindfulness Questionnaire-15 (FFMQ-15) respectively. Secondary outcomes measured included empathy and stress levels. Qualitative feedback was also sought.
Results:
Primary outcomes included improvements in self-compassion and mindfulness. Out of 21 participants, 19 (90.5%) completed both pre- and post-intervention questionnaires. Participants experienced significant mean improvements in self-compassion (p<0.05) and mindfulness (p<0.05), while improvements in empathy and stress levels did not reach statistical significance.
Conclusions: A short online Mindful Caring workshop could be an avenue to improve self-compassion and mindfulness, which may have a downstream effect on burnout.

Keywords
Self-compassion, Mindfulness, Medical education, Online interventions
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Background
Burnout: a pressing issue
Burnout is prevalent amongst physicians, contributing to distress and depression. It correlates with decreased job satisfaction, decreased patient quality of care, lower levels of empathy, and increased rate of medical errors (Shanafelt, 2009; Thomas et al., 2007). Immense stress level often prevents them from attending to their own wellness (Irving et al., 2009; Wallace & Lemaire, 2009), increasing potential psychological illness, anxiety, alcoholism and even suicidal ideation (Brown, 2008; Knight, 2011).

Compared to college graduates from other courses, medical students bear higher prevalence of burnout. Depressive symptoms, suicidal ideation, and a low sense of personal accomplishment are also more prevalent in medical students than doctors (Dyrbye et al., 2014). A meta-analysis including 129,123 medical students showed that the prevalence of depression and suicidal ideation was 27.2% and 11.1% respectively (Rotenstein et al., 2016). Young adults between 18 to 24 years old are also vulnerable to developing mental disorders such as major depressive disorder (Patten, 2000), anxiety disorders (Alonso et al., 2004) and psychiatric comorbidities (Wittchen et al., 1998).

Sources of anxiety include both academic stressors and personal stressors, such as dealing with immense workloads, impractical expectations, lack of self-belief, intense competition, and time management (Cherkil et al., 2013; Nandi et al., 2012; O’Reilly et al., 2014). These stressors are counterproductive to academic progress, with those experiencing higher levels of distress performing poorly and dropping out of medical school (Dyrbye & Shanafelt, 2011).

Self-compassion: a factor that protects against burnout
In recent years, interest in self-compassion has risen as it has become identified as a means of resiliency against burnout, compassion fatigue, work exhaustion, and higher levels of job satisfaction amongst physicians (Babenko et al., 2019; Duarte et al., 2016; Durkin et al., 2016).

Self-compassion comprises three key components: self-kindness as opposed to self-judgement, common humanity as opposed to isolation, and mindfulness as opposed to over-identification (Neff, 2004). Self-kindness is the ability to be kind and understanding to oneself rather than being critical and judgemental. Common humanity is the recognition that our experiences are a part of the larger human experience—no one is perfect, and everyone will face challenges in this life. Mindfulness, in the context of self-compassion, is the ability to be aware of one’s negative thoughts and feelings arising in situations of difficulty. A clinician who responds with ‘empathetic distress’ by identifying with suffering of the patient leads to distress burnout (Klimecki & Singer, 2012). The development of self-compassion is thus thought to increase healthcare professionals’ understanding of suffering and common humanity, guiding their actions to meet patients’ needs and improve patient outcomes (Reyes, 2012).

There is a developing base of evidence that contemplative practices such as mindfulness-based interventions and loving-kindness meditation can cultivate self-compassion (Boellinghaus et al., 2014). The synergistic effect between self-compassion and mindfulness can be explained as mindfulness enabling increased clarity for the development of self-compassion, while self-compassion reduces attention-interfering cognitions such as rumination, thus enhancing the development of mindfulness (Keng et al., 2012).

Mindfulness: attempting to improve self-compassion
In the past three decades, Mindfulness-Based Interventions (MBIs) have become popular therapeutic interventions for common psychological problems such as stress, anxiety, and depression (Keng et al., 2011). Mindfulness is the awareness that arises from paying attention, on purpose, in the present moment and non-judgmentally with the aim of cultivating a stable and non-reactive present-moment awareness (Segal et al., 2013), allowing mindfulness to alleviate intense emotional states (Keng et al., 2011).

A study demonstrated that a Mindfulness-based cognitive therapy (MBCT) course helped general practitioners reduce burnout, perceived stress, manage work pressures, feel more relaxed, and experience greater empathy and compassion for themselves, their colleagues, and their patients (Hamilton-West et al., 2018).

Mindfulness interventions have proven to improve self-compassion (Boellinghaus et al., 2014), and are readily implementable and scalable as an educational intervention in the undergraduate setting (MacLean et al., 2020).

The effects of COVID-19 as altering factors
Mental health has also taken a sharp downturn through the COVID-19 pandemic especially amongst healthcare professionals (Xiong et al., 2020). A considerable proportion of healthcare professionals experience mood and sleep disturbances, which only increases the urgency and importance of finding solutions to the mental health crisis (Pappa et al., 2020).

To reduce physical interaction and adhere to safe distancing measures, a plethora of online tools have been used for education, business continuity, or fellowship. We decided to investigate these platforms to bring mindfulness and self-compassion to medical students. An online intervention allows for increased ease of access and a lower entry barrier for participation. A recent search of the literature showed most online mindfulness interventions were asynchronous, pre-recorded, and took many weeks. A short webinar style intervention, which could be easily integrated into a busy curriculum, has not been tested.
One study provided three guided meditation audio clips over three weeks, with instructions to perform the exercises on at least three different days each week, to undergraduate students and were shown to reduce stress and aid coping (Messer et al., 2016). Another study provided university students with an online platform with texts, videos, and guided mindfulness meditations for two weeks, and showed an increase in mindfulness, with a reduction in perceived stress, symptoms of anxiety, and depression (Cavanagh et al., 2013). The few online MBIs that run a full MBSR programme do so over an extended duration of more than a month (Wolever et al., 2012; Zernicke et al., 2014).

What is missing from the literature is a full mindfulness programme compressed to a shorter duration and provided through an online webinar with bidirectional interaction in real time.

Research question
Given that mindfulness affects self-compassion, we wanted to investigate if a week-long online mindfulness intervention would be beneficial to the medical students, given the constraints of their busy curriculum.

The objectives of this study were to investigate to what extent the week-long Mindful Caring workshop improves self-compassion (Self-Compassion Scale), mindfulness (Five Facet Mindfulness Questionnaire-15), empathy (Toronto Empathy Questionnaire), while reducing stress (Perceived Stress Scale).

Methods
Intervention design
This study was conducted for the purposes of evaluation of a pilot programme and adopted a prospective pre-post single arm interventional design.

Recruitment began in March 2020 through the university student portal for the April programme, and in April 2020 for the May 2020 programme. A final number of 21 students enrolled: 14 Year 3 students for 13-16 April 2020 and 7 Year 4 students for 12-15 May 2020.

Several clinical tutors who were active in teaching medical students were invited to participate in the programme. This arrangement provided a rich learning platform for the students who learnt from experienced clinicians in the medical field.

Creation of the programme
Dr. Virginia Lien, a retired medical doctor pursuing Masters Studies in Mindfulness-Based Cognitive Therapy (MBCT) at the University of Oxford Mindfulness Centre (2018-2020), was interested in introducing a course in mindfulness and compassion to address the well-being of medical students. Dr. Lien set up The Mindful Compassion Project in 2017 as a non-profit platform to bring greater awareness to mindfulness and compassion for healthcare in Singapore.

The Mindful Caring Programme was first conceived by Dr. Lien in September 2019 in collaboration with Dr. Victor Loh (NUS YLL School of Medicine, Family Medicine Department) and Ms. Lynna Chandra (Assisi Hospice Singapore Board) to enhance medical students’ mindful self-awareness, self-compassion and compassion in caring for their patients.

The original programme “Mindful Caring—Caring for Ourselves and Our Patients” (A Medical Student Elective) was initially planned as an in-person Year 3 Medical Student Elective for NUS YLL SOM students at the Assisi Hospice (1–12 June 2020) to include didactic and experiential learning in mindfulness and compassion, the medical humanities, as well as a field-work component at the Assisi Hospice in Singapore. The Electives Department of NUS YLL SOM promoted the programme to all Year 3 medical students. Enrolment began in November 2019 with a registration deadline of 28 February 2020. Pre- and post- research measures (qualitative and quantitative) were formulated in January 2020. Six students were enrolled in the June 2020 Elective.

When the Covid-19 pandemic disrupted in-person medical clinical teaching in March 2020, a request was made by Dr. Victor Loh to offer this programme earlier in April and May 2020 as an online workshop for Year 3 and Year 4 medical students. Hence, two separate online teaching workshops were offered: in April 2020 for the Year 3 students and May 2020 for the Year 4 students. Each teaching workshop had a four-day teaching segment for mindful self-care and self-compassion for healthcare (by Dr. Virginia Lien); followed by another four-day teaching segment in the medical humanities (by another facilitator). The fieldwork component was omitted due to Covid-19.

Description of the programme
As part of a two-week long elective programme, the Mindful Caring workshop was held across the span of four days in the first week. The second week of the programme covered medical humanities which will not be discussed here. The workshop was conducted over Zoom, a video-conferencing software as a real time seminar.

The Mindful Caring workshop is a four-day programme comprising didactic and experiential teachings aimed at teaching mindfulness and self-compassion (Table 1). Didactic teachings included topics such as understanding stress physiology, unhelpful thinking patterns, and how to motivate the self with compassion instead of criticism. Experiential activities included the mindfulness of body and breath, the raisin exercise, and the self-compassion break.

The programme is divided into two complementary sections derived from the Mindful Self-Care programme (MSCP) (Kenny, 2016) and the Self-Compassion Training for Healthcare Communities (SCHC) programme (Neff et al., 2020). Eight hours each were dedicated towards covering mindfulness and self-compassion respectively.

Study population
Participants were third and fourth year medical students studying in the National University of Singapore, which has
a five-year undergraduate medicine programme (Samarasekera et al., 2015). Participants were recruited for the workshop via an email invitation sent to 600 students as an option for their electives. Students who signed up for the Mindful Caring workshop were asked to participate in the study as part of programme evaluation. In total, 21 students participated in the Mindful Caring workshop, of which 19 (90.5% response rates) completed both pre-course and post-course surveys (Figure 1). Only the completed responses were included in the analysis.

The size of the sample was largely determined by the number of participants interested in the workshop (as compared to other choices of electives), and by the number of facilitators for small group discussions.

The inclusion criteria to participate was being enrolled in NUS Medicine within Academic Year 19/20 and having completed at least one academic year of clinical attachments. Pre-clinical students were excluded.

Table 1. Topics and exercises covered in the workshop curriculum.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Session</th>
<th>Method</th>
<th>Components</th>
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</thead>
<tbody>
<tr>
<td>Mindfulness</td>
<td>1</td>
<td>Didactic</td>
<td>• Stress physiology and the impact of chronic stress</td>
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<td>• The cognitive model</td>
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<td>• Mental distractions and emotional states</td>
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<td>• Mindfulness of the body</td>
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<td>• The three emotional regulation systems</td>
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<td></td>
<td></td>
<td>Experiential</td>
<td>• Informal mindfulness: raisin exercise</td>
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<td>• Mindful movement</td>
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<td>• Pleasant events calendar</td>
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<td>• Mindfulness of body and breath</td>
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<td>• Mindfulness of routine activity</td>
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<tr>
<td>Self-compassion</td>
<td>2</td>
<td>Didactic</td>
<td>• Managing mental states</td>
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<td>• Understanding unhelpful thinking patterns</td>
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<td>• Renewing energy for work</td>
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<td>• Understanding the exhaustion funnel</td>
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<td></td>
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<td>Experiential</td>
<td>• Mindful responses to negative thinking</td>
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<td></td>
<td>• Mindfulness of a home or work situation</td>
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<td>• Stress signature and wise action plan</td>
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<td></td>
<td>3</td>
<td>Didactic</td>
<td>• Introduction to self-compassion</td>
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<td>• Dispelling misgivings about self-compassion</td>
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<td>Experiential</td>
<td>• Supportive touch</td>
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<td>• Self-compassion break</td>
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<td>• 3-centre check-in</td>
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<td>• STOP practice</td>
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<td>• Soles of the Feet</td>
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<td>4</td>
<td>Didactic</td>
<td>• Motivating self with compassion instead of criticism</td>
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<td>• Self-Compassion and Resilience</td>
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<td>• Self-compassion and burnout</td>
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<td>• Compassion with equanimity</td>
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<td></td>
<td>Experiential</td>
<td>• Working with difficult emotions (soften-soothe-allow)</td>
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<td>• Core intentions and Values for health professionals</td>
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Figure 1. Timeline of the programme.
Data collection

Participants were sent a link to the pre- and post- semi-quantitative survey with 70 questions and space for qualitative response (Tan (2021)). The survey was hosted on Google Forms. Participants were given identification codes generated by a research assistant who was not involved with the intervention or data analysis.

The demographic data collected included gender and year of study. A Self-Compassion Scale was used to assess self-compassion (Neff et al., 2017). It comprises 26 items categorised into 6 subscales (self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification). Subscales are calculated first, with reverse scoring for the negative subscales, and finally a total score is created from the mean.

A Five Facet Mindfulness Questionnaire-15 was used to assess mindfulness (Baer et al., 2008). It comprises 15 items organised into 5 subscales (observing, describing, acting with awareness, non-judging, non-reactivity). Responses are provided on a five-point Likert scale. Subscales are calculated first, with reverse scoring for certain questions, and a total score is created from the summation of subscale scores.

A Perceived Stress Scale was used to assess perceived stress levels (Cohen et al., 1983). It comprises 10 items scored on a 5-point scale with scores from 0 to 4. Certain questions require reverse scoring, and a total score is created from summation of all scores. A score from 0–13 indicates low stress, 14–26 indicates moderate stress, and 27–40 indicates high perceived stress.

The Toronto Empathy Questionnaire was used to assess empathy levels (Spreng et al., 2009). It comprises 16 items scored on a 5-point scale with scores from 0 to 4. Negatively worded questions are reverse scored, and a total score is created from the summation of all scores. Participants were also given two open-ended questions regarding their stressors and stress management techniques: 1) Tell us about your stressors. 2) Tell us about how you cope. Open-ended feedback for the programme was also collected.

Analysis

Quantitative analysis was performed using R commander. A paired t-test was used for comparison between the mean pre- and post- intervention scores of the participants for the validated tools.

Qualitative content analysis was conducted though open coding on Microsoft Excel by DH and CT, where narratives relating to stress, coping mechanisms, and the effects of the Mindful Caring workshop were identified. Categories of codes were created, and emergent common themes were obtained. Only data from complete responses were analysed.

Ethics and consent

Ethical approval for this study was granted by the National University of Singapore Institutional Review Board (NUS-IRB reference code: S-20-147). The study was exempt from full review and the requirement for documented participant consent.

Students and clinical tutors who participated in each workshop were informed that the teaching workshops would be recorded on the Zoom recording platform for the purpose of teaching evaluation within the university. Verbal consent for recording was obtained at the beginning of each workshop.

Results

Demographics

Of the 21 workshop participants, 19 participants (90.5%) completed both the pre-course and post-course questionnaire. The age range of participants were between 21 years old to 24 years old (Table 2). The full raw dataset can be found in the Underlying data (Tan (2021)).

Self-compassion

Participants reported an improvement in self-compassion, with the pre-workshop mean score of 2.77 rising to the post-workshop mean score of 3.4 (Figure 2).

All components of the self-compassion scale, including the reverse scored scales (self-judgment, isolation, over-identification) saw statistically significant increases, with the sole exception of the common humanity component (Figure 3).

<table>
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<th>Table 2. Characteristics of study participants.</th>
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<td>Male</td>
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</table>
Mindfulness
The baseline mean FFMQ-15 total mindfulness score of participants was 45.89. The mean FFMQ-15 total mindfulness score post-workshop rose to 50.58. The T-test indicated that students significantly improved their mindfulness after participating in the workshop, p<0.05 (Figure 3).

While positive increases throughout scores of 5 components making up the FFMQ-15 (observing, describing, acting with awareness, non-judging, and non-reactivity) were seen, only the observing component reached statistical significance, with the mean pre-workshop score being 9.79, and the mean post-workshop score being 11.42, p<0.05 (Figure 4).

Perceived stress levels
Perceived stress fell from 19.3 (5.84) to 17.9 (5.86) with a p-value of 0.48 (Figure 5).

Empathy
Empathy saw a positive increase from 48.7 (6.22) to 50.4 (5.93) with a p-value of 0.40 (Figure 6).

Qualitative outcomes
When it came to stress, the vast majority of participants quoted academic concerns as one of the main contributors of stress. One participant wrote, “lacking confidence in my skillsets/ application of knowledge, concerns about being behind compared to my peers.” Managing personal expectations, and juggling social relationships were the next two most pressing stressors, followed by extracurricular commitments.
A majority of participants reported that they benefitted from this short programme, with many stating that they found it applicable in their daily life. They described being “more aware of how I respond to my own misgivings in life and in career” and how learning self-compassion was “the right step forward in order to provide better healthcare for everyone else”.

A common theme was the utility of having a mix of theoretical knowledge and hands-on experiences. Five participants found that the hand-on experience was important, and one shared that having “opportunities to practise the skills being taught, rather than just receiving a didactive lecture on the practises” were useful, while three participants expressed the utility of understanding the theoretical basis, with one participant sharing that it allowed them to “understand [the] validity of claims” being made.

Another common theme expressed by seven participants was the appreciation of breakout sessions in small groups. One participant shared that they were “more comfortable sharing with their peers in a more private setting”, and that it was easier to “open the floor to personal opinions”.

Two participants felt that one barrier to experiencing the full impact of the workshop was it being conducted on a virtual platform, which according to one participant “diminished it’s impact”, and would have preferred physical interaction and learning in person.

**Discussion**

Our results demonstrate that the Mindful Caring workshop was able to effect improvements in participants’ self-compassion and mindfulness. The improvements in self-compassion were seen in five out of six components, while improvements in mindfulness were only seen in one out of five components. This highlights that the Mindful Caring workshop primarily exerts its effect on self-compassion, with mindfulness being secondary.

Self-compassion scores were significantly impacted through the short four-day course of psychoeducation introducing self-compassion concepts and practices. This may suggest that self-compassion is an innate quality that can be uncovered through good didactic teaching and appropriate group experiences.
However, to effect significant changes in mindfulness, especially components of describing, acting with awareness, non-judging, non-reactivity, would require more time to change the habituated neural pathways of how the mind works. Mindfulness, thus, may be more effectively implemented through a longer course format such as the eight-week MBSR or MBCT programme, or a six-week programme which the MSCP was originally designed for.

The drop in perceived stress levels may be due in part to students feeling less pressured while attending ungraded electives online during to the COVID-19 pandemic. Perceived stress levels may increase during clinical rotations when the academic year resumes.

We observed high levels of empathy amongst participants, which did not change significantly during this short programme. Given that medical students experience a well-documented decline in empathy over the course of their clinical training (Neumann et al., 2011), a longitudinal follow-up will be helpful to ascertain if this programme helps mitigate decline in empathy levels for participants.

Limitations and future directions
This study was not a randomized controlled trial, and participants self-selected to participate in the intervention as part of an elective programme. As a pilot study, our primary aim was to evaluate the impact of the Mindful Caring workshop on students before and after the intervention, thus a control group was not surveyed.

The lack of a control group prevented us from understanding whether the positive changes observed in the Mindful Caring workshop were solely due to the programme intervention. Given that this was a pilot study with 21 students, it is also not statistically powered to observe the true efficacy of the programme. However, with the statistically significant results shown and the positive feedback from the students, it does warrant future studies with a control arm to better investigate the true efficacy of a short online mindfulness and self-compassion programme for medical students’ well-being.

A larger controlled study evaluating intervention effects may be warranted. Blinded, observational measures, including follow-up measures, may improve the validity of the results. The pilot data also suggests that further investigations of presenting the Mindful Caring workshop across virtual and physical platforms is warranted, to compare if the virtual mode is as effective as in-person teaching.

Offering the Mindful Caring workshop to preclinical medical students and other healthcare professionals may also be merited as this could be a programme to successfully improve self-compassion and mindfulness amongst healthcare students and practitioners. As a short online programme, it is implementable and scalable in the educational context. A larger clinical trial will be necessary to determine the full effectiveness of this programme, and the persistence of the changes observed.

The current COVID-19 pandemic has shown us how important it is to be aware of our stressors and to find ways to mitigate them. The cultivation of self-compassion and mindfulness in the context of a short online workshop has the potential to prevent stress in medical students from building up into psychological distress over time. This pre-emptively deals with the problem of burnout which can increase during one’s medical training and early medical career (Frajerman et al., 2019; Rodrigues et al., 2018).

We hope that our demonstration that mindfulness can improve self-compassion contributes one small intervention, amongst others, that can allow physicians and healthcare professionals to become more compassionate to themselves.

Data availability
Underlying data
Mendeley Data: Mindful Caring. http://doi.org/10.17632/6c4nnhyrp.1 (Tan (2021)))

This project contains the following underlying data:
- Raw Data.xlsx (Pre-course and post-course questionnaire results from Mindful Caring workshop participants)

Extended data
This project contains the following extended data:
- Pre & Post-Course Questionnaire.pdf
- Programme Timeline.JPG
- Curriculum.docx
- Results Tabled.docx

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

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