

## VIRTUAL REALITY: AN EXPLORATION OF STUDENT AND TEACHER PERCEPTIONS OF A VIRTUALLY DELIVERED MINDFULNESS CURRICULUM IN UNDERGRADUATE MEDICAL EDUCATION

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### **INTRODUCTION**

It was well established prior to the pandemic that medical trainees face significant stressors and high rates of depression and burnout.[1,2] Recent surveys have shown even higher rates of stress, anxiety and depression in medical students with the pandemic onset.[3,4] The effects of mindfulness programs in reducing stress, anxiety and depression have been well documented,[5,6] as has their effect on increased empathy and compassion in health professionals and trainees.[7-9]

The University of Ottawa implemented a mindfulness curriculum in 2014;[10,11] the in-person curriculum included a 30-minute introductory session, 7-9 elective one-hour longitudinal sessions throughout pre-clerkship, weekly 30-minute meditation “drop-in” sessions and a half-day workshop delivered in the students’ first year of clerkship. Each longitudinal curriculum session included didactic and experiential exercises based on specific learning objectives. Each session linked a mindfulness concept with a

mindfulness skill (experiential exercise). Concepts included the ego, the 'voice in the head', dealing with emotional pain, stress reduction, resilience and using technology mindfully. Experiential exercises included formal meditations such as breath-awareness, body-awareness, awareness of thoughts, awareness of emotion and communication exercises among others. Time was spent each session in group discussion, debrief and self-reflection about student experience and the application of mindfulness practice both in self-care as well as whole person patient care. Students were given experiential assignments to practice between sessions along with readings from a course book.

Other medical schools have similarly implemented some form of mindfulness teaching into their curricula. At Monash University, there is a course called the "Health Enhancement Program" delivered to students in the first year of medical school.[12] At Rochester University, a course called the "Mindful Practice Program" is delivered in the third year of medical school.[13] At McGill University, a "Mindful Medical Practice" curriculum is taught in the 6 months leading up to clerkship.[14] The structure of our sessions were influenced heavily by the course delivered by the Rochester group.

Although the integration of a mindfulness curriculum has been well received by students, attendance during in-person sessions has been low.[11] There are several possible reasons for this, including the time constraints of medical training and reluctance to participate in face-to-face sessions with peers due to unfamiliarity or uncertainty about mindfulness practice. Online delivery may offer theoretical advantages with respect to accessibility, privacy and some level of anonymity. The feasibility of virtual mindfulness programs in medical schools has been previously demonstrated with promising results,[15,16] however data on the acceptability of this format is limited. A unique opportunity was afforded by the required virtual delivery of this curriculum during the COVID-19 pandemic to further assess perceptions of a virtually delivered mindfulness curriculum.

The primary aim of this study was to explore the benefits and limitations of a wholly virtually delivered curriculum that were identified as important by students and teachers. The goal was to identify key concepts to inform recommendations for improving or implementing mindfulness curricula at the undergraduate medical education level to better support student wellbeing.

## **METHODS**

### ***Study Design***

A mixed methods research design was used in this study. All medical students enrolled in their first or second year at The University of Ottawa during the 2020-2021 academic year (n=341) were eligible to participate if they had attended at least one virtual mindfulness curriculum session. All mindfulness teachers that had led at least one virtual mindfulness curriculum session were eligible to participate, excluding the

research team (Total of 10 mindfulness teachers; 3 were involved in the research project and excluded, therefore total eligible teachers was  $n=7$ ).

Eligible students and teachers were invited to complete a short online questionnaire via email and to attend an online focus group. An incentive for eligible students to complete the questionnaire was a draw to win a gift card valued at \$200. Eligible students who chose to participate in the focus group were compensated \$75.

Ethics approval was obtained from The University of Ottawa Research Ethics Board (File number: H-03-21-6334).

### ***Curriculum Participation***

The in-person longitudinal mindfulness curriculum was launched at our university in 2014 and continued to be held in-person until March of 2020, at which time the curriculum was modified to its virtual format due to the pandemic. The curriculum remained purely virtual from March 2020 to September 2022 (2.5 years), after which the in-person sessions were resumed.

In both the in-person and the virtual curriculum delivery formats, the 30-minute introduction to mindfulness session was mandatory and delivered as a whole class, large group session. Thereafter, all further mindfulness curriculum sessions were elective small group sessions consisting of less than 12 students. The in-person curriculum had an additional mandatory small group workshop during clerkship (year 3 of study) which consisted of about 15 students. This workshop was suspended during the pandemic. Students were given recognition for their pre-pandemic attendance and participation in the elective in-person mindfulness sessions, which counted towards a Certificate of Medical Humanities. However, this initiative was suspended when the medical school pivoted to the virtual format during the pandemic.

### ***Data Collection***

The online questionnaire (Appendix A) was administered to trainees and mindfulness teachers with items related to demographics and a 5-point Likert scale to measure perceptions about accessibility, acceptability and satisfaction of the virtual curriculum.

Two student focus groups and one teacher interview were conducted by an independent research assistant via Microsoft Teams. For each focus group and the teacher interview, pre-set questions and probes (Appendix B) were used to explore the perceptions of participants regarding the virtual curriculum, including benefits, limitations and suggestions for future directions for the mindfulness curriculum. Each interview was recorded and auto transcribed, and transcriptions were reviewed for accuracy.

The current study surveys were collected April – May 2021 and interviews/focus groups were performed remotely in June 2021 (i.e., after more than 1 year of the virtually-delivered format).

## DATA ANALYSIS

Descriptive statistics were used to describe the results from the online questionnaire. The textual data from the focus group transcripts were coded and categorized into themes independently by two research team members in accordance with conventional content analysis.[17] The entire research team then met on three separate occasions to ensure theme saturation was reached, to review themes and to address discordance through group consensus. Theme saturation was not relevant for the teacher group as there was only one participant. Participant quotes were edited for grammar.

## RESULTS

### *Questionnaire Data*

35 students completed the online questionnaire, which is a 10% response rate (35/341 is the total possible number of eligible students as this is the total number of students who had the opportunity to participate in virtual sessions. The exact number of students who actually participated in at least one virtual session is not available as attendance was not recorded for elective virtual sessions). Most students had prior mindfulness experience: 11% through medical school (in-person curriculum prior to the pandemic) and 57% outside of medical school. Participant demographics are outlined in Table 1.

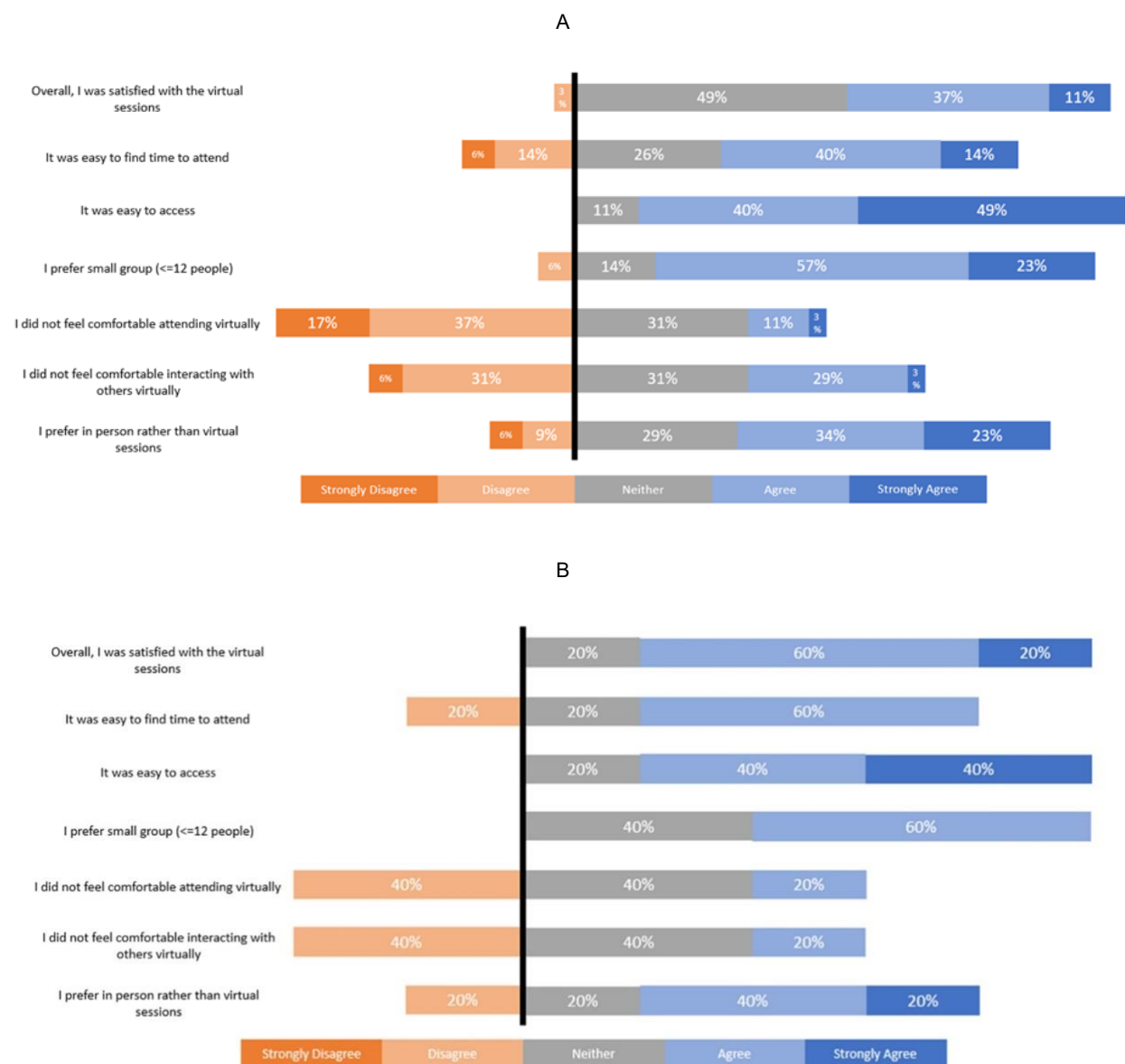
**Table 1.** Demographic information of student participants.

	Total n (%)
Language	
French	9 (26)
English	26 (74)
Gender	
Female	21 (60)
Male	13 (37)
Prefer not to say	1 (3)
Age	
<22	3 (9)
22-25	26 (74)
26-29	3 (9)
30+	3 (9)
Year	
First	24 (69)
Second	11 (31)
Previous experience with mindfulness	
Yes, medical school in-person curriculum pre-pandemic	4 (11)
Yes, outside medical school	20 (57)
None	11 (31)
Attendance at previous in-person mindfulness sessions	
Yes, drop-in meditation	2 (6)
Yes, longitudinal session	2 (6)
Yes (both sessions)	1 (3)
None	29 (85)
Likelihood of attending future sessions after attending virtually	
More likely	13 (37)
Less likely	4 (11)
It had no effect	18 (51)
Total	35

Figure 1 shows the student questionnaire responses. The majority felt virtual sessions were easy to access (89%). Roughly half of the respondents were satisfied with the virtual sessions (48%). A minority of students did not feel comfortable attending virtual sessions (14%) and about one third did not feel comfortable interacting in the virtual environment (32%). A slight majority of students preferred in-person sessions over virtual (57%).

Five out of the seven eligible teachers (71%) completed the online questionnaire (Figure 1). The majority preferred to teach in person (60%). A minority did not feel comfortable teaching and interacting with students virtually (20%). The majority were satisfied overall with teaching virtually (80%).

**Figure 1.** (A) Student and (B) teacher Likert scale responses to online questionnaire.



## ***Focus Group Data***

A total of 11 students participated in focus groups. One teacher participated; their input was thus treated as an individual interview.

### Student Perceptions

#### *Positives of Virtual Delivery*

Two major themes emerged from student perceptions regarding the positives of virtual delivery: (1) convenience, accessibility and low commitment and (2) provided anonymity and a less intimidating environment. For example (see Appendix C.1 for further supporting quotes):

*P01: "For me, if it were not offered virtually, I probably would not have gone in person.... The convenience of being able to log in and have my camera off and participate or not or just listen passively or not was greatly appreciated. Especially as I was new to this.... I think if it wasn't because of the virtual component, I would not have been as confident to attend."*

#### *Negatives of Virtual Delivery*

Four major themes emerged from student perceptions regarding the negatives of virtual delivery: (1) lack of dedicated space and susceptibility to distraction, (2) lack of connection and sense of community, (3) less accountability and (4) screen fatigue. For example (see Appendix C.1 for further supporting quotes):

*P11: "I feel like there's a connection that you have with others in a space [that is missing] online...[and] the opportunity to talk to people afterwards [is] more natural or organic when that happens in person versus online... [Online,] just as easily as you log on, you can log off."*

#### *Motivations and Limitations in Attendance*

Students were motivated to attend mindfulness sessions for many reasons, including their prior experience with mindfulness, curiosity to learn, peer recommendations, value placed by faculty and desire to address health concerns and stress reduction. For example (see Appendix C.2 for further supporting quotes):

*P02: "[I was] trying to establish what a balanced life in med school looks like [and] seeing that [mindfulness is] an important thing that the faculty sees as important, I think was a big takeaway for me."*

Busy schedules, academic demands and the timing of sessions were identified as main reasons for decreased attendance. Students did recognize that periods of busyness and stress were times when mindfulness would be helpful, but it was not viewed as a priority. For example (see Appendix C.2 for further supporting quotes):

*P08: "I know it's a bit counterintuitive because we're told when your life's hectic that's the time that you should really be engaging in these [sessions]. These are helpful for precisely those instances but it's also a lot easier said than done when you have a lot of due dates, or you have an exam coming up."*

### *Student Recommendations*

The main recommendation proposed by students to address limitations of the mindfulness curriculum was to have a hybrid curriculum with both in-person and virtual sessions. This would provide convenience, a sense of connection/community and a less intimidating environment. For example (see Appendix C.3 for further supporting quotes):

*P02: "A hybrid model would be an ideal scenario...when [school] is more hectic, virtual [sessions] are really great. When you have more time...in-person sessions are really nice."*

Other suggestions for improvement included more session times, a buddy system to introduce people, an enhanced online platform to improve engagement, theme-based sessions and more continuity with the progression of sessions to build on skills throughout the year.

### Teacher Perceptions

Only one teacher accepted to participate and thus was treated as an individual interviewee. They strongly favored in-person delivery as it allows for more engagement, commitment to practice and shared experiences. They viewed virtual delivery as less beneficial and not conducive for mindfulness practice. For example (see Appendix C.4 for further supporting quotes):

*"It's much easier to turn on your computer and connect to something, but it's not as beneficial. I feel completely convinced about this. There's no doubt in my mind that being present [in person] makes a huge difference and it makes a huge difference to people's sense of engagement."*

## **DISCUSSION**

While many positive features of virtual delivery were highlighted, a slight majority of students who participated in this study reported that they preferred in-person mindfulness sessions. Many students proposed a hybrid model to maximize the benefits of both delivery methods. While students valued the convenience and less intimidating nature of virtual delivery, many identified wanting an in-person element to better fulfill a sense of connection and community. Virtual delivery may be beneficial in attracting and introducing students to the practice of mindfulness, in addition to facilitating maintained practice during busier periods, while in-person sessions may provide the space to deepen and grow their practice. A recent study showed similar effectiveness of both in-person and virtual mindfulness courses in healthcare students,[18] which supports the suggestion for a hybrid model.

Low participation rates in the study limit the generalizability of findings. A partial explanation for low teacher participation was that three of the mindfulness teachers were involved in this research study and, therefore, did not participate due to a potential conflict of interest. A possible explanation for low student participation could be overall low attendance in the elective mindfulness curriculum. This is in line with other studies that have shown lower participation in mindfulness sessions, despite showing feasibility and

receptiveness to inclusions in the curriculum.[11, 15, 19] Common reasons reported for decreased attendance were busy schedules and prioritizing medical content courses over mindfulness when there were time constraints. A similar theme has been identified in previous research.[19] There was an awareness by some students of the paradox that as school stress increased, they were less likely to attend mindfulness sessions even though they perceived it could improve stress.

This study highlights that even students who have an interest in mindfulness to support mental health can struggle to prioritize practice due to the demands of medical training. Future efforts focused on how a hybrid elective curriculum may help improve attendance are warranted. The incorporation of mindfulness sessions into the core curriculum may provide another option to explore engaging medical students in this practice. For example, integrating concepts of mindfulness into interview skill sessions for mindful communication or palliative care and chronic pain management for resilience and compassion teaching may serve to highlight the relevance to medical practice and whole person care.

In this regard, a program at McGill University appears to be heavily focused on mindfulness-related skills believed to be instrumental in delivering effective whole person care (i.e., skills that will be relevant to clerkship, residency and beyond).[14] This curriculum has been well received by students. Furthermore, similar to McGill, weighting the number of sessions closer to clerkship when these skills will be required could be considered.[14] A theme that emerged from the focus group data indicates that students were encouraged when faculty placed value on mindfulness; just by having an optional formal curriculum highlights the importance of leadership in promoting cultural shifts regarding the wellness of medical trainees. Exploring how wellness and mindfulness specifically translate to improved patient care [20-22] may offer further insights into the benefits of such practices.

Only a single teacher participated in an individual interview. Overall, they voiced a strong preference for in-person mindfulness teaching to promote connection, commitment and engagement. However, the implications of this singular perspective are limited. A sample of their quotes is included to offer an example of the teacher perspective. Future study is needed to corroborate and explore teacher perspectives and to evaluate how these align with student perceptions.

## CONCLUSION

The pandemic offered a valuable opportunity to evaluate the virtual delivery of sessions promoting wellbeing to the medical student population. While the conclusions from this data are limited, two key insights are proposed to focus future efforts in implementing mindfulness curricula in medical education:



1. There is a role for both virtual and in-person mindfulness teaching as each delivery method offers unique advantages. Virtual delivery may be beneficial for introducing students to mindfulness and to maintain practice during busier periods, while in-person sessions may provide the space to deepen and grow their practice as well as offer a sense of community and connection.
2. Students are less likely to prioritize wellness practices such as mindfulness despite appreciating its benefits. Integrating mindfulness education directly into the core medical curriculum with faculty engagement may mitigate this barrier and foster a cultural shift supporting medical professional wellness, which may contribute to improved patient care. ■

## CONFLICTS OF INTEREST

Three members of the research team are mindfulness teachers in the mindfulness curriculum. A member of the research team also published a book on mindfulness [10], however this is a free online book and they do not receive any proceeds from this book.

## FUNDING

Grant support for this study was received from the University of Ottawa Department of Medicine.

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## APPENDIX A: ONLINE QUESTIONNAIRE

### Online Survey Questions for Students

1. Which stream are you currently enrolled in?

- English
- French

2. What is your age?

- <22
- 22-25
- 26-29
- 30+

3. What is your gender?

- Male
- Female
- You don't have an option that applies to me. I identify as (please specify) \_\_\_\_\_
- Prefer not to say

4. What is your current year of study in medical school?

- 1<sup>st</sup> year (MD 2024)
- 2<sup>nd</sup> year (MD 2023)

5. At this time, what is your intended career specialty? (Click all that you are considering)

- Medical
- Surgical
- Diagnostic/Laboratory Medicine
- Pathology
- Anaesthesia
- Psychiatry
- Undifferentiated/don't know

6. How much previous experience do you have in mindfulness principles and practices?

- None
- Very little
- Some
- A lot

7. On average, what amount of home mindfulness practice do you do per week (include formal meditation, informal practice [brief mindfulness insertions in daily activities], yoga, retreats)?

- < 10 minutes
- 10-60 minutes
- 1-2 hours
- 3-5 hours
- 5-7 hours
- 7+ hours

8. How many of the weekly meditation drop-in sessions did you attend this academic year (2020-2021)?

- 0
- 1
- 2-4
- 5-7
- 8-12

9. How many of the lunchtime longitudinal mindfulness curriculum sessions did you attend this academic year (2020-2021)?

- 0
- 1
- 2
- 3
- 4
- 5

10. Did you have previous experience with mindfulness practice before attending sessions this academic year (2020-2021)? Yes (Ottawa curriculum)/Yes (outside of medical school)/No

11. Did you attend any in-person mindfulness sessions last academic year (2019-2020)? Yes (weekly meditation drop-in, lunch-time longitudinal sessions, both)/No

12. Did the virtual format of the curriculum this academic year (2020-2021) influence the likelihood of you attending the sessions? Yes, I was more likely/ Yes, I was less likely to attend/No it had no effect.

13. After attending a virtual session, were you more or less likely to attend future sessions? (1 much less likely, 2 less likely, 3 no change, 4 more likely, 5 much more likely)

#### Questions 14-20

14. I prefer to attend mindfulness sessions in person rather than virtually

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

15. I prefer small group (<=12 people) virtual mindfulness sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

16. It was easy to access the virtual sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

17. It was easy to find time to attend the virtual sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

18. I did not feel comfortable attending virtual mindfulness sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

19. I did not feel comfortable participating/interacting with others in the virtual mindfulness sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

20. Overall, I was satisfied with the virtual mindfulness sessions

1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

21. I would like to participate in a focus group session (Yes/No)

22. Comments:

#### Online Survey Questions for Teachers

1. Did you teach any in-person mindfulness sessions last academic year (2019-2020)? Yes (weekly meditation drop-in, lunch-time longitudinal sessions, both)/No
2. How many weekly meditation drop-in sessions did you teach this academic year (2020-2021)?
  - 0
  - 1
  - 2
  - 3
  - 4
  - 5
3. How many of the lunchtime longitudinal curriculum sessions did you teach this year (2020-2021)?
  - 0
  - 1
  - 2
  - 3
  - 4

Questions 4-10:

4. I prefer to teach mindfulness sessions in person rather than virtually  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
5. I would prefer to teach a small group (<=12 people) in a virtual mindfulness session  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree

6. It was easy to access the sessions  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
7. It was easy to find time to teach the sessions  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
8. I did not feel comfortable teaching virtual mindfulness sessions  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
9. I did not feel comfortable interacting with students in the virtual mindfulness sessions  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
10. Overall, I was satisfied with teaching mindfulness sessions virtually  
1 – Strongly disagree    2 – Disagree    3 – Neutral    4 – Agree    5 – Strongly agree
11. I would like to participate in a focus group session. Yes/No
12. Comments:

## **APPENDIX B: FOCUS GROUP QUESTIONS**

### Student Focus Group Questions

1. Did you find the virtual mindfulness sessions useful? Probe: How? Why not?
2. What motivated you to attend the virtual mindfulness sessions?
3. What was your previous experience with mindfulness practice? Probe: Do you think being new to or familiar with mindfulness affected your experience with online virtual delivery?
4. What do you feel were some of the benefits of virtual delivery? Probe: Did the virtual drop-in sessions make it easier or more difficult to attend? Do you think it affected the number of sessions you attended?
5. What do you feel were some of the limitations and challenges of virtual delivery? Probe: What solutions would you suggest for these limitations?
6. It was noticed that student attendance in the virtual sessions was high early on in the school year but later declined. What do you think are the reasons for this?
7. Did you attend any in person sessions last year? How did the in person sessions compare to virtual sessions? Probe: Did you prefer one over the other?
8. In the future would you prefer a curriculum that is exclusively virtual, in person or a combination? Probe: Why?
9. Is there anything that you would like to add about your experience with the virtual mindfulness curriculum?

### Teacher Focus Group Questions

1. What do you feel were some of the benefits of virtual delivery? Probe: Did you notice a change in the number of students attending sessions online vs in person? Did you notice a change in student participation or engagement in online vs in person?
2. What challenges did you experience with delivering the curriculum virtually? Probe: What solutions could you suggest for these challenges?
3. Did you teach any in person sessions last year? How did the in person sessions compare to virtual sessions? Probe: Did you prefer teaching one over the other?
4. In the future would you prefer teaching a curriculum that is exclusively virtual, in person or a combination? Probe: Why?
5. Is there anything that you would like to add about your experience with virtual mindfulness as a mindfulness teacher?



## APPENDIX C: SUPPLEMENTAL PARTICIPATION QUOTES

**Table C.1.** Supplemental quotes from student focus groups supporting the themes of the positive and negative aspects of virtual delivery.

	Themes	Description	Representative Quotations	1 <sup>st</sup> -Order Concepts
Positive Aspects of Virtual Delivery	Convenient	Requiring little commitment, offering flexibility and easy access	<ul style="list-style-type: none"> <li>• P07: "Since it was virtual it didn't matter where we were. So, I did some sessions at my cottage. I did some sessions while I was out on a walk in the morning. So that was definitely a benefit that I found."</li> <li>• P08: "And the nice thing about it was... it wasn't something that you necessarily had to feel like: Oh! I have to go... You didn't feel obligated to do it and I think that flexibility really worked well for me."</li> <li>• P08: "I honestly thought that being able to do it virtually took away a lot of those barriers that I often found myself facing [with the in-person sessions]."</li> <li>• P08: "When it's virtual, after finishing class, you have 10 to 15 minutes to collect your thoughts and set [the] intention that you are going to this. It's a lot easier I think to get into it as opposed to walking into a room panting because you just ran across from wherever. So, I think that was definitely the biggest benefit for me personally."</li> <li>• P09: "Easy to access and easy to kind of drop in even if you are a few minutes late."</li> <li>• P11: "For me [it] definitely increased the number [of sessions] that I attended because of that up front convenience factor... It was easy to drop in because I could have woken up even a few minutes before and then drop into the session. I didn't feel like I had to have a lot of upfront commitment [like I would] to get to an in-person spot."</li> <li>• P11: "[The virtual sessions were] a lot less stressful in a lot of ways in terms of having to rush or to... have to commit to making the time to [get] to another location.... Logging on was definitely low commitment up front."</li> </ul>	<ul style="list-style-type: none"> <li>• Accessibility</li> <li>• Easy to attend</li> <li>• Less rushed</li> <li>• No travel/ Removed physical travel</li> <li>• Online convenient</li> <li>• Any location</li> <li>• Flexibility</li> </ul>
	Less intimidating	Welcoming and low-stakes environment, especially for those new to mindfulness	<ul style="list-style-type: none"> <li>• P01: "For me, if it were not offered virtually, I probably would not have gone in person.... The convenience of being able to log in and have my camera off and participate or not or just listen passively or not was greatly appreciated. Especially as I was new to this.... I think if it wasn't because of the virtual component, I would not have been as confident to attend."</li> </ul>	<ul style="list-style-type: none"> <li>• Anonymity</li> <li>• Enjoyed camera off</li> <li>• Non-judgmental space</li> </ul>

			<ul style="list-style-type: none"> <li>• P03: "If I wanted to continue, I would prefer to do it in person. Take that first step in a low-risk scenario which the online platform is conducive to. But then if I want to continue, I probably wouldn't really want to online. I personally don't enjoy the platform. I'd rather do it in person."</li> </ul>	
Negative Aspects of Virtual Delivery	Practice environment	Lacking dedicated mental and physical space leads to distractibility	<ul style="list-style-type: none"> <li>• P05: "I definitely enjoy the in-person one better just because you're in a controlled environment. I think the problem with being at home or elsewhere in a virtual setting is that you're already so familiar with the environment so... you can kind of cozy in or lie down... maybe fall asleep if it's early in the morning while doing the meditation or simply do other tasks that you had to do in the morning before getting to school."</li> <li>• P07: "I found that sometimes I wasn't able to get as much into the Zen mode compared to when it was in person, and I knew that when I walked into that room [in person] that was my mindfulness area, and I would go in and that's the only thing that I would be doing there."</li> <li>• P11: "It could also be a little bit stressful depending on who's up [in the house] in the morning and trying to find a calm space to be able to just kind of stay present. We have a lot of animals in the house and family running around so sometimes it was hard to keep things [quiet]. That would have been the benefit of doing it in person I suppose is that you have that space to be quiet in."</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to stay engaged</li> <li>• Easier to focus in controlled environment</li> <li>• Element of distractibility in virtual sessions</li> <li>• Lack of dedicated space</li> <li>• Distractions at home</li> </ul>
	Shared practice	Lacking connection to others and sense of community	<ul style="list-style-type: none"> <li>• P03: "If I wanted to practice mindfulness or build that sense of a community...there are other people in my program or my school that are also practicing mindfulness [and in terms of] connecting with them, [virtual sessions] didn't really foster that sort of inclusive environment."</li> <li>• P05: "When I first started practicing mindfulness it felt very awkward to keep my eyes closed for a long time while you're in a room full of other people. But once you get used to it then it's very very rewarding and you build really strong relationships with the other people in the room."</li> <li>• P05: "I started to realize this is something that I enjoy doing especially in a group [in person] because you can share your feelings... I think that was really what motivated me to keep coming back and ultimately really enjoy these mindfulness sessions."</li> <li>• P07: "Specifically in my case since I can compare these virtual sessions with the in-person sessions last year... [in person], I was able to get more into the zone or more Zen and just was more connected to myself and to others as well. So definitely I missed the in-person aspect of it in terms of connection with other people and myself."</li> </ul>	<ul style="list-style-type: none"> <li>• Missing connection</li> <li>• Desire for community</li> <li>• Group practice motivated to return</li> <li>• Lack of connection with virtual</li> <li>• In person builds strong relationships</li> <li>• Connection with self and others</li> </ul>

			<ul style="list-style-type: none"> <li>• P11: "I feel like there's a connection that you have with others in a space [that is missing] online...[and] the opportunity to talk to people afterwards [is] more natural or organic when that happens in person versus online... [Online,] just as easily as you log on, you can log off."</li> </ul>	
	Accountability	Lacking responsibility about one's mindfulness practice	<ul style="list-style-type: none"> <li>• P08: "I do think I would still prefer the in person [delivery] simply because there's more accountability. I think there's more accountability for yourself... So, I would still prefer in person even though there [are] so many positives with the virtual."</li> <li>• P11: "In person is great [in terms of] being accountable to yourself. It definitely does build accountability."</li> </ul>	<ul style="list-style-type: none"> <li>• More accountability</li> <li>• Motivating on difficult days</li> </ul>
	Screen fatigue	Lacking energy to attend virtual sessions, but this could be related to the nature of work from home	<ul style="list-style-type: none"> <li>• P02: "I think one factor for me was just getting really tired of staring at my screen all day as the year went on and looking for any opportunity to get away from that and not look at my screen."</li> <li>• P07: "A lot of the issues are the fact that COVID-19 is a pandemic right now and we're all working from home and so things are [all] virtual. So, it's not necessarily the way that the mindfulness sessions were delivered that we have struggles with."</li> </ul>	<ul style="list-style-type: none"> <li>• Screen fatigue</li> <li>• Pandemic related struggles</li> </ul>

**Table C.2.** Student motivations and limitations regarding attendance.

	Themes	Description	Representative Quotations	1 <sup>st</sup> -Order Concepts
Motivations	Previous experience	Prior knowledge of mindfulness' effects on stress and health motivated some to attend	<ul style="list-style-type: none"> <li>• P06: "I've practiced mindfulness before...and it made a big difference in my life and that was back in undergrad. Since [coming to Ottawa for medical school]... with everything going on in medical school I was starting to feel very overwhelmed and especially with COVID as well."</li> <li>• P02: "I was exposed to mindfulness a little bit before this year during undergrad [during] periods where I was really stressed out and was trying to find ways to manage that."</li> </ul>	<ul style="list-style-type: none"> <li>• Prior practice</li> <li>• Previous experience made a big difference in life</li> </ul>
	Curiosity	Students trialed sessions out of interest	<ul style="list-style-type: none"> <li>• P03: "I can't say I've actively practiced mindfulness before. I had been exposed to the concept again in undergrad and I was just interested in learning more and so that was my motivation to attend session."</li> </ul>	<ul style="list-style-type: none"> <li>• No prior experience</li> <li>• Interested in learning more</li> </ul>

	Peer recommendation	Increased attendance with peer involvement	<ul style="list-style-type: none"> <li>• P05: “The main motivation...I found that for me it was mainly doing it with other people. So having friends to meditate with you. When med school came around and sharing with friends the stress that overwhelms [you]. One of my friends was actually attending the mindfulness sessions and he said, ‘why don't you give this a try.’”</li> </ul>	<ul style="list-style-type: none"> <li>• Sharing stressful experiences with peers</li> <li>• Recommended by friend</li> </ul>
	Value placed by faculty	Students appreciated the focus on mindfulness by faculty and the opportunity and resources provided	<ul style="list-style-type: none"> <li>• P11: “It encouraged me to attend because it was on [our calendar] ...even though it was optional it still felt that it was important enough to be on our calendar so I should attend it.”</li> <li>• P02: “[I was] trying to establish what a balanced life in med school looks like [and] seeing that [mindfulness is] an important thing that the faculty sees as important, I think was a big takeaway for me.”</li> <li>• P09: “I think that [mindfulness is] a really important and healthy habit and I really appreciate that Ottawa has really pushed this in a sense... I hope that [mindfulness] becomes a mainstay across all med schools and hopefully in all future classes. Because I personally did find it very helpful.”</li> </ul>	<ul style="list-style-type: none"> <li>• Important enough to be on calendar</li> <li>• Appreciate resources available</li> <li>• Appreciate faculty's commitment to mindfulness</li> <li>• School sees mindfulness as important</li> </ul>
Limitations	Time constraints	<i>Busy schedules and academic demands were factors for decreased attendance at sessions throughout the academic year</i>	<ul style="list-style-type: none"> <li>• P10: “I felt like progressively during the year I got more and more busy... I think it was because the [medical] content got more heavy...so [mindfulness] just started to not be a priority... it just started getting pushed as something that I could do next week.”</li> <li>• P08: “I know it's a bit counterintuitive because we're told when your life's hectic that's the time that you should really be engaging in these [sessions]. These are helpful for precisely those instances but it's also a lot easier said than done when you have a lot of due dates, or you have an exam coming up.”</li> </ul>	<ul style="list-style-type: none"> <li>• When busy lower priority</li> <li>• Disconnect between awareness and behaviour</li> </ul>

**Table C.3** Recommendations from students for addressing limitations of the mindfulness curriculum.

Theme	Description	Representative Quotations	1 <sup>st</sup> -Order Concepts
Hybrid Curriculum	Students valued integration of both in-person and virtual sessions	<ul style="list-style-type: none"> <li>• P01: “It would be nice if I saw a platform where you have both a virtual and in-person component so the people who are not as confident to show up in person do the virtual [and] get comfortable with that and then transition to the in person.”</li> <li>• P02: “A hybrid model would be an ideal scenario...when [school] is more hectic, virtual [sessions] are really great. When you have more time...in-person sessions are really nice.”</li> </ul>	<ul style="list-style-type: none"> <li>• Virtual better when busy</li> <li>• Flexibility</li> <li>• In person when more time</li> <li>• Prefers combination</li> </ul>

<b>Online Forum</b>	Improved online platform to enhance the online experience and improve engagement	<ul style="list-style-type: none"> <li>• P11: "For building more of a connection with people...some kind of a forum or social media platform that could be used to talk about stuff after a mindfulness session might be helpful."</li> </ul>	<ul style="list-style-type: none"> <li>• Build online community</li> <li>• Share resources online</li> <li>• Improve bonding</li> </ul>
<b>Themed Sessions</b>	Sessions relevant to student life which help build a sense of community and motivate attendance	<ul style="list-style-type: none"> <li>• P02: "Maybe something that could potentially help build that sense of community. I'm wondering if more targeted sessions, for example a first-year pre-exam mindfulness session, where... all the first years can attend, and it's geared towards exam stress or something like that... Something that makes people feel like...this is for me specifically! I could see myself feeling: Oh! This is like perfect timing for my exam! I'm going to go, and all my classmates will be there!"</li> </ul>	<ul style="list-style-type: none"> <li>• Targeted sessions</li> <li>• Geared towards student events/experiences</li> </ul>
<b>Continuity</b>	Sessions with progression of knowledge and skills to help with motivation	<ul style="list-style-type: none"> <li>• P06: "Personally to me, it kind of felt like each session was stand-alone.... there didn't seem to be much [progression] as the year went on. So, I think if you were able to introduce maybe a system where the mindfulness sessions became "harder" I guess you could say or more advanced. I think that would really [draw] people in and increase engagement or like a sense of [continuity and progression]."</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of continuity</li> <li>• Progressive sessions</li> <li>• Expanding on learned technique</li> </ul>

**Table C.4.** Themes from teacher focus group.

Theme	Description	Representative Quotations	1 <sup>st</sup> -Order Concepts
<b>In-person allows collective learning</b>	In-person delivery is preferred for more engagement and commitment	<ul style="list-style-type: none"> <li>• "Everybody's sharing this experience...being present together in the same space. I don't know why but it makes that kind of common learning more possible."</li> <li>• "I think the interactivity, the complete presence, the context dependence is much more vibrant in person than remotely."</li> </ul>	<ul style="list-style-type: none"> <li>• Better in person</li> <li>• Shared experiences</li> <li>• Common learning</li> </ul>
<b>Virtual delivery convenient, but suboptimal practice</b>	Virtual delivery is viewed as less beneficial for mindfulness practice	<ul style="list-style-type: none"> <li>• "The very nature of the technology, having multiple windows and a computer that allows you to be everywhere and anywhere, encourages multitasking which encourages un-mindfulness basically."</li> </ul>	<ul style="list-style-type: none"> <li>• Not an ideal medium</li> <li>• Technology distracting</li> <li>• Convenience of online does not make up for the benefits of in person</li> </ul>

		<ul style="list-style-type: none"><li>• “It’s much easier to turn on your computer and connect to something, but it’s not as beneficial. I feel completely convinced about this. There’s no doubt in my mind that being present [in person] makes a huge difference and it makes a huge difference to people’s sense of engagement.”</li><li>• “I think basically the bottom line for me is that mediating through technology is not beneficial for your own mindfulness nor for your ability to encourage other people. That’s what it amounts to really.”</li></ul>	
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