

Article

COVID-19 Limitations on Doodling as a Measure of Burnout

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Abstract: Pre-COVID-19, doodling was identified as a measure of burnout in researchers attending a weekly, in-person health narratives research group manifesting team mindfulness. Under the group's supportive conditions, variations in doodling served to measure change in participants' reported depression and anxiety—internal states directly associated with burnout, adversely affecting healthcare researchers, their employment, and their research. COVID-19 demanded social distancing during the group's 2020/21 academic meetings. Conducted online, the group's participants who chose to doodle did so alone during the pandemic. Whether the sequestering of group participants during COVID-19 altered the ability of doodling to act as a measure of depression and anxiety was investigated. Participants considered doodling during the group's online meetings increased their enjoyment and attention level—some expressed it helped them to relax. However, unlike face-to-face meetings during previous non-COVID-19 years, solitary doodling during online meetings was unable to reflect researchers' depression or anxiety. COVID-19 limitations necessitating doodling alone maintained the benefits group members saw in doodling but hampered the ability of doodling to act as a measure of burnout in contrast to previous in-person doodling. This result is seen to correspond to one aspect of the group's change in team mindfulness resulting from COVID-19 constraints.

Keywords: COVID-19; Burnout, Doodling; Team Mindfulness; Anxiety; Depression

1. Introduction

Burnout—a negative, job-related psychological state exhibited through physical fatigue, emotional exhaustion, and loss of motivation [1]—is a syndrome arising from prolonged chronic interpersonal stressors associated with work. It is represented by three key dimensions [2]: overwhelming exhaustion, negative work-related feelings of cynicism and disassociation, and a sense of futility from perceived job-affiliated failure. Furthermore, it has been particularly associated with the health professions [3]. Early in the history of burnout research, it was found to be significantly related to job termination but not to absenteeism [4]. For healthcare researchers and their employers, the discontinuation of work undertaken equates to a loss of the production of valuable research [5]. Directly associated with symptoms of depression and anxiety [6,7], if burnout is to be diminished, an easily employed and reliable measure of depression and anxiety is important.

In contrast to burnout, work engagement is a positive and fulfilling state of mind related to work characterized by behaviours that are vigorous, dedicated, and absorbed in the task at hand [8]. Work engagement has a positive influence on work-related performance [9]. Characterized as embedded in their work environment, positive individual attitudes and behavioural expressions of researchers in a work organization are interacting results of their own characteristics and work-defined factors which include the characteristics of their interpersonal relationships among team members [10]. Team mindfulness with respect to how a work environment is constructed and maintained has

thus evolved to become an important consideration with respect to enhancing personal fulfilment related to work [11], where team mindfulness is defined as a shared belief among team members that their interactions are defined by a non-judgmental awareness and attention in processing within-team experiences [12].

Doodling is defined as an aimless scrawl made by a person while their mind is otherwise applied [13]. Reasons for this behaviour have been identified: boredom, the need for a productive activity while otherwise engaged, a form of fidgeting when forced to stay inactive, a means of artistic expression [14], to provide “thinking” benefits [15], as a method of discovery [16] or as something that produces a maximum activation of the medial prefrontal cortex compared with colouring and free drawing [17]. What doodling behaviour is not is a method to improve encoding performance in an episodic memory task [18].

Doodling has recently been recognized as a potential measure of depression and anxiety based on unexpected outcomes from comparing doodles over a number of years associated with one diverse and voluntary health narrative research group where doodling was introduced [19]. The result with respect to casual, self-reported levels of depression and anxiety by the group participants was that—under the well-defined conditions of the group—variations in doodling served as a measure of change in these internal states of researchers. As such, there is reason to suppose that doodling holds potential to directly gauge the range of disaffect associated with burnout and increase work engagement in researchers under conditions where team mindfulness is supported and maintained.

The positive results of the ability of doodling to measure the affective level of healthcare researchers as part of one health narratives research group were demonstrated when the group met in person during the pre-COVID-19 years. The group operated as a mindful team [12], respectful of each member and encouraging of each person’s point of view. This was done by collectively and regularly attending to the team members experiences and their underlying objectives, tasks, roles and structures in a non-judgmental way [20]. The facilitator of the group recorded and posted to a private Facebook group (to which every member belonged) the full transcript of the group’s activities, ensuring that the views of every member were given the attention envisioned when they were provided to the group. The group then continued entirely online as a result of the pandemic social distancing limitations during the 2020/21 academic year. Other than the group migrating to an online meeting format, all other aspects of this health narratives research group remained as they were during the previous four years. Yet, the lack of in-person meetings altered the team mindfulness and resulted in a very noticeable difference with respect to doodling. With the change in this one important variable, it was useful to compare the ability of doodling to gauge internal states when the doodling was done alone during the pandemic year rather than with others in person as in years before.

If doodling retained its ability to identify the level of depression and/or anxiety of the researchers when meetings were online then there is reason to believe it represents a robust measure. Otherwise, the usefulness of doodling to reflecting internal states may be dependent on in-person meetings under the specific conditions of this health narratives research group where team mindfulness was supported. To determine the outcome, feedback from the participants in the group during the spring session of the 2020/21 academic year will be presented and the results of the previous in-person meetings of the group will be compared with the doodles produced alone during the COVID-19 pandemic for those researchers who acknowledged experiencing ongoing depression and anxiety with respect to their research.

2. Materials and Methods

The Health Narratives Research Group (HeNReG), offered through the Department of Psychiatry at the University of Toronto, is designed to take each participant's story that initiated their healthcare interest and, with the help of weekly writing prompts, evolve it into a narrative with a particular point of view. Two of the important features of the group include its diverse membership and the continuous developmental feedback method employed. The intention is to reenergize and sustain career-long research and decrease burnout from research-related anxiety and depression. Aspects necessary for reengagement by researchers who experience burnout include the need for professional autonomy and a feeling of community based on trust with fair and equitable treatment among members [21]—all features of the team mindfulness of the HeNReG. In this regard, the group is responsive to the philosophy-as-therapy program initiated by Wittgenstein [22] and since undertaken by others, such as Crittendon [23], Peterman [24], Hagberg [25], and Heaton [26]. However, there are no claims to the group being medical therapy. Most relevantly, the HeNReG represents an example of a group expressing team mindfulness [11,12].

Those researchers who take part in the HeNReG are willing to consider others their equals regardless their level of academic attainment or their area of research concentration. They originate from various University of Toronto departments and other universities whose associates are part of the Department of Psychiatry's international Health, Arts and Humanities listserve. These include students (undergraduate, graduate), faculty, and researchers (staff and alumni) who are seeking a group setting for healthcare research-related introspection. For the most recent, 2020/21, pandemic year, two of the twenty members participated online from Nigeria. In total for this most recent year, health research members represented the following disciplines: Diaspora and Transnational Studies; Paediatrics; Education; Statistical Science; Economics; Bioinformatics and Computer Science; English; Social Work; Information Science; Neuroscience; Psychology and Bioethics; Family Medicine; Health Studies and Immunology; Medicine; Drama and Communication; and East Asian Studies.

The 2020/21 academic year was the first in its six year history in which meetings were entirely online rather than face-to-face. In other respects, the group remained the same since doodling was introduced as a feature of the HeNReG in the most recent four years of the group's operation. During the COVID-19 pandemic, the weekly two-hour online group discussion took place on a private Facebook group and revolved around the written responses members gave to five-minute prompts provided by the facilitator over the Messenger app. Before the meeting, the responses were returned to the facilitator for posting on the private Facebook group. Once posted, and the online meeting began during the designated and prearranged time, participants were encouraged to ask clarifying questions to all of the group's members regarding their responses following a particular structure. The intent of the structure for writing prompts which are the focus of the group is to ask the conceptually simplest, most objective and least anxiety-provoking questions at the beginning of the academic year and gradually move to those that are more theoretically difficult, subjective and personally sensitive. A simple, objective question that is unlikely to invoke anxiety is, "When did you begin your research?" A theoretically difficult, subjective question more likely to promote anxiety (and is thus asked later in the academic year when group trust has developed) is, "Why do you continue with your research?" As such, the order of questions is those beginning with the word "when," then "where," "who," "what," "how" and, finally, "why." Each type of question is asked for at least four weeks, with "how" and "why" questions asked over six weeks.

While waiting for members to respond to their questions asked online over the two-hour meeting period, the participants were encouraged to doodle on their own, as they would have done in person as part of a group in the years before COVID-19. The doodling was understood to be something extra to do while they waited, and only if they

chose. There was no requirement to doodle; group members did not participate thinking their doodles represented formal creations to be assessed by others. It was understood that the doodles were to be unprompted and internally-driven. Those produced were shared at the end of the online meeting for interest, not evaluation. Participants were encouraged to see doodling as a way to pass the time while waiting to pose questions online to others and respond to questions provided to them.

At the end of the fall and the spring term, participants were asked to complete an online feedback form for the HeNReG. The results of both the fall and spring feedback forms were examined together at year end. Questions from the spring term form were summarized and follow in the results.

3. Results

In comparing the effect of online doodling during the time of the COVID-19 pandemic with the previous years, it is relevant to examine what group members thought of the doodling aspect of the program, the amount they actually doodled, and how they believed COVID-19 affected the function of the HeNReG. What they thought about doodling and the affect they believed COVID-19 had are results taken from the returned feedback forms. The amount each member actually doodled become available from examining the private Facebook group posted images for the 2020/21 academic year.

3.1. Feedback on Doodling and COVID-19

Researchers participating in the HeNReG complete an online Google feedback form created by the facilitator following the model of the forms used by facilitators of other programs associated with Health, Arts and Humanities in the Department of Psychiatry. The 2020/21 spring term was the first in which researchers were asked their opinion on the addition of doodling to the function of the group with the question, "What are your thoughts on doodling aspect of the HeNReG experience?" To ensure that researchers provided an answer on the feedback form to the question about doodling, this question was tagged on the form as requiring an answer.

It was the second time that researchers were asked how they believe COVID-19 has altered the HeNReG with the question, "Do you have other thoughts/comments on your experience as a participant in the HeNReG this term, especially as a result of COVID-19?" However, in order to ensure an answer was provided, spring 2021 was the first time their answer to the question was required, as a number of researchers had chosen not to answer the question on the fall feedback form.

There were two participants who did not return the spring 2020/21 feedback form. One was a researcher who participated in the fall term only. As the doodling question was added during the second term, his view on doodling was not requested, although when he did participate in the fall he was one of the researchers who doodled. The other participant who did not return the feedback form indicated she, "wasn't able to participate enough to be able to answer the questions. It's been a tumultuous year at work." This group member was someone who regularly doodled the previous academic year. During 2020/21, instead of doodles, she sent in nature photographs she had taken while on walks during the time the HeNReG took place. Yet, her providing of photographs ended shortly into the academic year as this participant felt overwhelmed with her work-related responsibilities regarding COVID-19. The full responses of the members to the spring 2020/21 feedback form with respect to doodling and COVID-19 can be found in Table 1.

Table 1. Responses on the spring 2021 feedback form by column of (1) all 20 HeNReG participants to (2) "What are your thoughts on doodling aspect of the HeNReG experience?" (3) the number of doodles each member shared with the group over the 2020/21 academic year and (4) "Do you have other thoughts/comments on your experience as a participant in the HeNReG this term, especially as a result of COVID-19?"

No.	Response to Doodling Question	Doodles Shared	Response to COVID-19 Question
1	On the days that I felt like I had an idea, the doodles were helpful. But sometimes I went to doodle and I froze because I wasn't really sure what to draw. In these moments, it was more beneficial to think about the conversation happening and not focus on the doodles.	5	This group was a great way to network as a student new to research, especially with all of the restrictions placed by COVID-19. This school year has been very isolating and I have not been able to go to the campus as a student yet. It was nice to have a platform where I could meet new people who I would have otherwise never have connected with.
2	I think it helps, but it helps even more when we are doodling alongside others in the same room. However, I did not doodle much this time around and I will get to it for the next year.	1	I reminisce about the times before when we would be able to meet at Mt Sinai, especially where there's some special touch to being with one another in person.
3	I stopped doodling years ago as I came to perceive it as a sign of not paying attention. Learned that it is a great way to gauge my mood and thoughts that I am bringing to the session.	16	My only experience with group was during Covid. Doing the group online supported my ability to attend as no travel and also to spend time reflecting during the sessions. Also, anxieties related to speaking in groups was not an area I was concerned with. Facebook as a platform was a bit challenging as refreshing my screen did not always bring updated postings. Also, wonder if a more dynamic platform would be considered or tips for navigating the platform.
4	I love doodling, it's one of the best parts of the HeNReG. People aren't encouraged to draw in everyday life and I think this is a great way to encourage it.	8	Although I miss in person meeting, online participation was done very well by [the facilitator]. The flexibility of meeting online is also a positive.
5	I believe that it gave me something to do during the two hour period of the meeting while waiting for people to participate online.	28	I was surprised that working entirely online affected the ability of people to participate in doodling to such a great extent. As well, I hadn't anticipated that so few people would ask others questions.
6	Love it! Especially in person, as doodling has always helped me feel calmer and more present in group discussions.	7	Having participated in HeNReG both in person and online, I have to note that it has been much more difficult to engage online, likely due to accumulated tiredness from all work and social activities being in a virtual format since the beginning of the pandemic. But I did appreciate [the facilitator's] accommodative format of not running HeNReG through a video call platform but rather having a set time for online Facebook discussion.
7	I like it a lot but I think it's easier to do the doodling in-person than online	2	I like the online environment especially because I don't need to travel to the room.
8	Great aspect - I would like to take advantage of this more in the future	0	Unfortunately, due to strains of Covid on my day to day to job, my capacity to actively participate this term was limited. I hope in future sessions, I can more actively participate
9	Gives me some time to think a while and sketch messy ideas in my mind	0	Hope covid 19 ends soon
10	I love the doodling aspect, because it <i>helps me as a fidgety person</i>	0	I think the way of handling the entirely online group was done very well!

11	I get carried away with doodling sometimes	4	I like the flexibility and structure of the meetings online, which allows me to read and reflect on the responses anytime of the day.
12	I like it. It's nice when I get to do it	4	no
13	It improves one's thinking capability.	0	My experience was fantastic. I enjoyed the course of the programme. It was a period of learning for a young and burgeoning researcher like me.
14	I have not participated in this part	0	Wish I could engage more and more actively
15	Some of them look super amazing!	0	I have been remote before already so not too different. Would be good if the time can be after work hours though. Might be nice to have an interactive call section to share and answer questions?
16	I do not doodle	0	Not now
17	Relieving	2 (photos)	It got me active engaged during the period of strict lockdown
18	Good	1 (photo)	Connection with other co-workers is important
19	<i>Not a member second term when question asked</i>	5	I appreciated being able to participate virtually during the COVID-19 pandemic. I wish there could have been a little more interaction, perhaps using Teams or Zoom? (<i>fall 2020 response</i>)
20	<i>Did not return feedback form</i>	2 (photos)	<i>Did not return feedback form</i>

What is particularly interesting about the feedback results presented in Table 1 is that there were only two members who, when asked, "What are your thoughts on doodling aspect of the HeNReG experience?" provided a reply that focused on the fact that they themselves did not doodle. Why this is noteworthy is that only five members doodled more than five times throughout the course of the twenty-eight week academic year and seven members never doodled at all this year when the HeNReG was conducted online only. Yet, rather than mention that they themselves did not doodle as their response, the majority of the participants either said they found doodling somehow useful to them or that they really loved or enjoyed doodling. In other words, most of the HeNReG members felt that they themselves didn't have to doodle for the doodling to be a benefit to them. This may have been because the doodles of others who did participate in doodling were posted online each week at the end of the two-hour meeting for every member to see. It is possible that knowing doodling was permitted and seeing that it was always part of the weekly group were sufficient for group members to feel that the idea of doodling relaxed them. Yet, that so few members decided to doodle during the online meetings was at the time unanticipated by the facilitator given that when the group meetings had taken place in person, almost everyone doodled each meeting.

One important reason why this behaviour of group members with respect to doodling may have occurred is the underlying concern of all participants about the ongoing pandemic. A number of the researchers participating in the HeNReG were also frontline healthcare workers who were intimately affected by daily concerns regarding COVID-19. Yet, only two of the respondents were entirely focused on COVID-19 in answering the question, "Do you have other thoughts/comments on your experience as a participant in the HeNReG this term, especially as a result of COVID-19?" The others commented on the importance of the group for interaction during the pandemic. Though most preferred

the previous in-person meetings (if they had been members of the group pre-COVID-19) there was the thought that the online meetings were preferable to in person meetings because there was no travel time involved. Most relevant to the discussion regarding doodling is that a concern with COVID-19 did not stop the participating researchers from thinking that doodling was a desired part of the group's activities—yet concern with COVID-19 may have been at least part of the reason why some people did not doodle themselves.

3.2. Pre-COVID-19 Doodling in Participants Reporting Depression and Anxiety

In the years before the COVID-19 restrictions demanded that meetings take place online, what is perhaps most relevant to considering how doodling reflected the psyche of the researchers participating in the HeNReG is comparing the in-person doodles over a period of time with respect to those participants who consistently indicated they were experiencing depression and anxiety. The doodles of two participants who had both expressed persistent depression and anxiety with respect to their research were examined as part of a multi-year analysis that previously suggested doodling might be a measure of depression and anxiety [19]. Both participants began membership at the HeNReG in the 2017/18 academic year and continued with the group each year following—including during the 2020/21 year for which meetings were no longer in person. It is for this reason that the doodles of these two participants for the 2020/21 year will be compared with those produced in previous years and with the comments they made in relation to the doodles.

Before these doodles are presented, it must be mentioned that some of the doodles may appear to be intentionally drawn. As such, it might be objected that the “doodles” produced by these researchers were not really that at all, but deliberate efforts to create “art.” Experts in palaeoart, for example, have argued that cave drawings cannot be considered doodles if there exist precise geometric patterns and an obvious symmetry to the drawings [27] or if there are repeated shapes and a distinct and limited number of motifs [28]. However, the reason for this pronouncement is the focus of these palaeontologists on establishing minimal semiotic capacity in their creators, not in examining criteria for doodling of academic researchers. Although some of the doodles produced by the group participants may look like planned art where doodles produced in other situations do not, normally when people engage in doodling in other circumstances they have very little time to work on their doodle and they are not encouraged to do so [29]. In a setting where participants have two hours to work on a doodle whenever they want and feel comfortable continuing with their efforts, as they do at the HeNReG, their doodles can develop into what looks like a planned creation. However, it was clear from what the researchers said in discussing their work that their creations developed as the time went on during each session and evolved during the time allotted. Planning, evaluating and forethought were not features of these creations, as they would be in deliberately making art. Instead, the doodles were drawn aimlessly, regularly focusing on motifs that were often drawn by the participant when choosing to doodle or else to reflect the doodler's immediate surroundings.

Over the first three years of their membership to the HeNReG, both of these researchers told the group they were experiencing anxiety and depression related to their research and this was affecting their work. What differed between the two researchers is the way in which their anxiety and depression evolved over the sessions. And what is extraordinary is how in both cases their doodles reflected what they had to say about their mental state at the time. Whether or not the sessions themselves diminished their depression and anxiety, the point is not that doodling causes the reduction in depression and anxiety (although it may)—it's that whatever the level of depression and anxiety of the researcher, the doodle reflected how the level changed over the course of the meetings.

The first researcher came to the group dissatisfied with his current area of research. He had wanted to switch his area of concentration but, until joining the group, hadn't done so. During the transition to his preferred area of research, he experienced a personal tragedy that affected him significantly—intensifying his depression—causing him to anxiously consider that he was wasting time and needed to redefine himself to meet his aspirations. In the 2019/20 academic year, this depression began to lift, creating a more relaxed and playful attitude about his research because he had completed work he considered destined for publication.

The transitions in his self-reported mental health during these years participating in the HeNReG were evident in his doodles and previously reported [19]. When initially depressed and anxious about his research, his doodles were of small, unrelated objects (Figure 1). As he switched disciplines for his research, he began to produce larger doodles (Figure 2). After the personal tragedy that increased his depression and anxiety, he doodled his acquaintances dancing around a black hole (Figure 3). It was the first time black represented a prominent colour in his doodles, that he drew a group of people, or had drawn stick figures. The same day, he also drew a page of colourful squiggles (Figure 4). In describing this colourful page, he said he decided to use colours but “wasn't feeling it.” In the weeks that followed, his doodles became focused on space and time (Figure 5). He then doodled his first abstract pattern (Figure 6) mentioning he was starting to feel better. After this, he started to focus on the effect of colour in relation to his design (Figure 7). Later, he said he wanted to “have fun” blending colours (Figure 8). This desire is represented in his now larger-page doodles, no longer confined to expressing identifiable content.



Figure 1. Doodle when participant was initially depressed and anxious about his research.

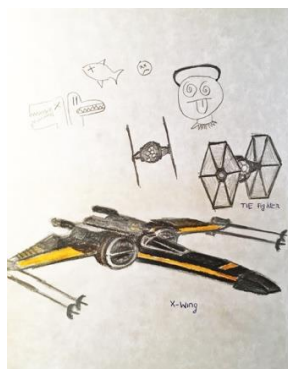


Figure 2. Doodle after participant switched disciplines for his research.



Figure 3. Doodles by participant after personal tragedy increasing depression and anxiety.



Figure 4. Doodle described by participant as “not feeling it” in using colours.



Figure 5. Doodle by participant focused on space and time.

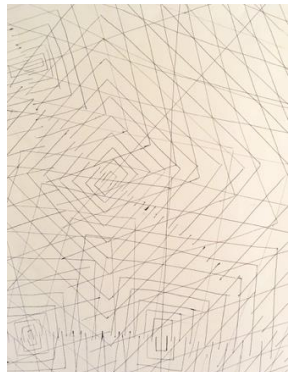


Figure 6. Doodle by participant of first abstract figure.



Figure 7. Doodle when participant focused on effect of colour.



Figure 8. Doodle when participant wanted to have fun with colour.

Another researcher represented someone agitated and depressed with a lack of work progress when he joined the HeNReG in 2017. His thought process was a complicated one that pulled together information from disparate disciplines, including stretching his own mental and physical limits. For two years, he increased the breadth and depth of his research program, then he was “running out of steam.” Following this admission, the researcher mentioned his research progress was depressing. Yet, though arriving late in obvious distress at one meeting, he persisted until the end of the day’s session to see the presentation of each person’s doodles. After this, he didn’t attend the meetings again for three months. Upon returning, he began to recover, saying he had regained the ability to concentrate productively on his research.

Similar to the previous group member, the mental state of this participant was evident in the doodles he produced. Initially, his doodles reflected small parts arranged complexly (Figure 9). Then, the day came he said he was losing energy – his doodle reflected this (Figure 10). As he began to note increasing depression, his doodles became focused on wanting to expand upwards from one point (Figure 11). The session where he arrived obviously ill (which he confirmed) was the only time his doodle involved using heavy black lines (Figure 12). The doodle he attempted upon returning after his absence included a number of interconnected ideas and colours as well as the use of a new medium (Figure 13). He said that with this doodle he was “beginning to work things out.”

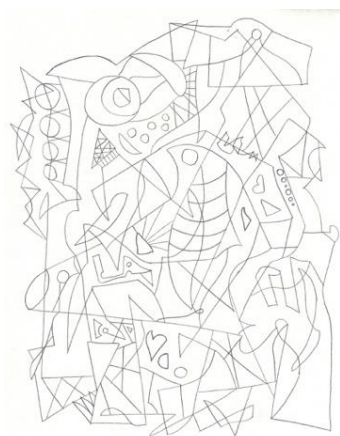


Figure 9. Doodle by participant of small parts arranged complexly.



Figure 10. Doodle day participant said he was losing energy.



Figure 11. Doodle by participant expanding upwards from one point.

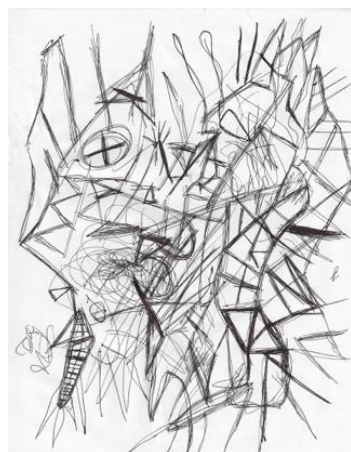


Figure 12. Doodle day participant arrived obviously ill using heavy black lines.

Figure 13. Doodle after participant returned after an absence when he was "beginning to work things out."

3.3. Doodling of Participants Reporting Depression and Anxiety During COVID-19

There were only two members of the HeNReG who reported being affected by both depression and anxiety over more than a one year period. Before COVID-19, the doodles of these two participants as part of the HeNReG attested to their internal mental state at the time each doodle was created. During these years, when they felt particularly depressed, this showed in the types of doodle both researchers created and how they chose and engaged with their materials. Intense depression brought with it doodles unique to that experience.

Without the casual conversation that characterized the team mindfulness of the in-person group meetings pre-COVID-19, many of the details of these researchers' depression and anxiety remained unsaid during the online meetings over the 2020/21 academic year. It was only as a result of additional messages the facilitator received from these two researchers, outside the HeNReG meetings, that information was provided by them that they both continued to experience depression and anxiety with respect to their research and that this was influenced by their isolation as a result of COVID-19.

Yet, the outcome for these two researchers during the pandemic year with respect to doodling was distinct from any previous year. One difference was that these researchers rarely doodled when they were left to doodle on their own. With in-person meetings, these two researchers enjoyed doodling at each HeNReG meeting. Now that they worked alone, they did not feel inclined to doodle.

Another dissimilarity from previous years was that the doodles they did produce were much less about the materials used for the doodle than they had been when, at the in-person meetings, various artists materials had been in easy reach of every researcher. Instead, this year the doodles they produced during COVID-19 were done exclusively with pencil and paper, using what was on hand for the researcher. In the case of the one participant, it meant all doodles were done in a small notebook. For the other, the one doodle produced for the entire year was done on a lined piece of paper intended for writing. The final difference was that none of the doodles produced for the year by these two researchers noted anything about their creators' internal states. Instead, the doodles were records of what was in front of the researcher at the time. This meant drawing what was in the surroundings for one researcher. For the other, it entailed drawing over spills that had come through from the other side of the chosen piece of paper. In both cases, while doodling alone, the researchers' mental states were obscured from what they were doodling in ways that they had not been in previous years.

The first researcher made four doodles over the year. The doodles are presented here along with what the researcher wrote about them when the doodle was submitted to the facilitator for posting to the private Facebook group for the year. "It's the view outside my window" (Figure 14). "Truck and whisk" (Figure 15). "It's a Hot Wheels car I have" (Figure 16). "Three emotions of stress, and a Hot Wheels car" (Figure 17). Although the final doodle of the three emotions of stress may appear to be of something that recorded the inner psyche of the researcher, instead, the stylized drawings related to what the researcher had just been studying before the meeting.



Figure 14. Doodle participant described as “the view outside my window”.

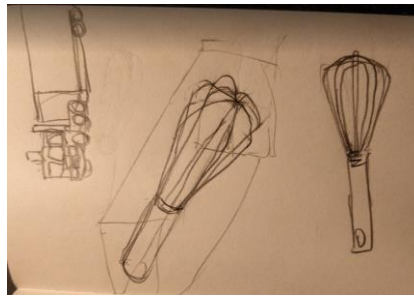


Figure 15. Doodle labeled by participant as “Truck and whisk”.



Figure 16. Doodle referred to as “It’s a Hot Wheels car I have” by participant.

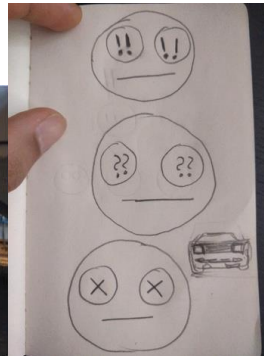


Figure 17. Doodle described by participant as “Three emotions of stress, and a Hot Wheels car”.

The group member who created these doodles specified when he sent in each of them that, unlike in the previous years, he did not want his pictures cropped so that only the doodle remained to be posted. Now, he considered how the doodle was being presented by his hand or on the table as important to what he wanted to say about the doodle. In all, this participant seemed far more objective about the relationship he had with his doodles than he had been in previous years. Although he contributed significant time to making each doodle, he did not include with his descriptions any noticeable degree of self-reflection regarding what he produced. This is especially interesting given that the final doodle he created for the year focused on the emotions of stress. Rather than a representation of his particular stress, the doodle reflected abstracted depictions of stress—ones that might be found in a comic strip, for example.

The second researcher completed only one doodle during the course of the 2020/21 academic year, often stating to the facilitator that he was remiss in not producing a doodle on any particular week. On first viewing, the doodle that was produced seems in keeping with those produced in previous years. However, the description of the doodle indicates that, if there are similarities, it was coincidental. “Started off going with little spots where the marker ink from the previous page seeped on-to this page, and just went

with the flow” (Figure 18). Thus, the doodle related to what was on the other side of the paper rather than the doodler’s internal states.

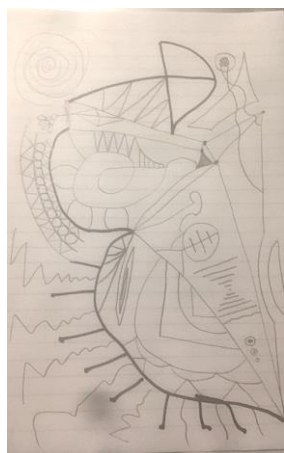


Figure 18. Doodle in which participant “just went with the flow”.

The most obvious reason why the doodles were unable to reflect the inner states of the researchers is that these participants didn’t do enough doodling over the academic to indicate any particular tendency. It is possible that if they had chosen to doodle more often during the year they would have produced doodles that revealed their mental states. On the other hand, what doodling they did do was not in keeping with the type of creations that might gauge any change in depression and anxiety for these two researchers.

4. Discussion

The aim of this investigation was to determine whether changes were made to the ability of doodling to act as a measure of depression and anxiety for one particular health narratives research group once the restrictions of COVID-19 meant the group was unable to meet in person. In considering whether doodling is able to act as a reliable measure of internal states during COVID-19, it should be noted that there has been little academic research in general concerning doodling.

Although peer-reviewed research on doodling began with a study of over 9000 doodlers before WWII [30], the next controlled study of doodling was not undertaken until seventy years later when doodling by nurses was considered [31]. Subsequently, a test was devised and implemented for doodling [32] and a Lancet study published concerning doodling [33]. Since then, the number of studies of doodling has increased [34,35,36,37,38,39,40] and, in 2015, the 2009 test was replicated [41]. Nevertheless, in over eighty years, this is the extent of peer-reviewed studies on doodling and none of these publications had considered doodling as a valid measure of any internal state until the report on the Health Narratives Research Group from last year [19].

Following the work of Maclay et al. [30], doodling can be considered to represent a spectrum ranging from merely entertaining to relaxing to something crucial for workplace creativity. If the doodler feels they are able to relax from doodling, this was found to be the ideal condition for an expression of mental states. As such, the doodler's belief in the therapeutic or self-empowering aspects of doodling appears a precondition of the use of doodling as a metric and informs whether doodling has the potential to measure levels of depression and anxiety. The supposition is that doodling will not reveal the

mental states of those participants who consider doodling either merely entertaining or as essential for their creativity. Those who find doodling relaxing will be the participants whose psyche will be measurable through doodling. These understandings were supported with the results of the HeNReG previously reported [19]. What has been added with this investigation during the COVID-19 limitations of 2020/21 is that for doodling to act as a measure of the psyche the doodler need not only be relaxed but creating within a social setting demonstrating team mindfulness rather than working individually.

The lack of research on doodling makes the results comparing the previous years of University of Toronto group with that of the pandemic year valuable. The progress from 2017-2021 of two doodlers in particular, who self-reported changes to their depression and anxiety and considered doodling relaxing, was highlighted as examples of how impactful the limitations imposed by COVID-19 were in negating the ability of doodling to act as a measure of their depression and anxiety as it had for the three years previous. At least one of these two participants recognized this change in the relationship to doodling during the pandemic. The number 12 participant in Table 1 introspectively commented that doodling, “helps even more when we are doodling alongside others in the same room.” The other participant of the two reporting depression and anxiety, represented by number 2 in Table 1, reaffirmed the personal value of doodling regardless of the limitations, “I like it. It's nice when I get to do it.”

4.1. Limitations

During the 2020/21 academic year, the HeNReG met entirely online within a private Facebook group over a set two-hour period once a week. This was the first year in the group's history that in-person meetings weren't a feature of the group. In every other respect, though, the format of the group, the type of membership, and what was expected of the group members remained the same. In being unable to meet in person, a number of aspects important to doodling were lost to the group and, as a result, it cannot be known how much these affected the outcome with respect to the inability of doodling to act as a measure for depression and anxiety during COVID-19.

When the group was able to meet in person, the facilitator had supplied various art materials in easy reach to encourage participants to doodle. As well, those group members who knew how to use the different materials would demonstrate to others the techniques they had developed. In this way, an informal peer mentorship was provided by, and to, participants in how to use the art materials effectively. When doodling on their own, group members could make use of only those art materials that they themselves had on hand. If the participant did not normally doodle it would be unlikely that they would have the range of materials accessible to them that had been available in previous years at the in-person meetings. During those years, participants often commented that it was the intriguing art materials that encouraged them to want to doodle [19].

Another experience that in-person meetings previously provided to participants was the casual comments that would be made as people doodled. Someone doodling would say out loud, “I'm switching to using the creamy colours” or “I decided to make circles” or “I don't know why I decided to draw this.” None of this talk was deeply revealing or relevant to the discussion of the written work occurring concurrently at the time; however, what it did do was remind the other participants that they too could be doodling if they were not or, if they were already doodling, to keep up their efforts. This feature—indicating the team mindfulness of years before—was not available in 2020/21, as participants who doodled did so on their own at home.

Lastly, the part of the in-person meetings that participants often enjoyed the most was the end-of-meeting sharing of doodles that took place, when members would have

the opportunity to talk about their doodles. At that time, other members often would ask questions of the doodler about their creation, providing additional opportunities for the doodler to mention what the doodle expressed in relation to their mental state at the time. It was not unusual for participants experiencing depression and/or anxiety to reflect on their mental states when talking about their doodle as a result of these in-person questions. This after-meeting sharing was an aspect to doodling that was lost when the sharing of the doodles took place only online. Although participants could have asked questions online of the doodlers in relation to what they had doodled, this never took place. In other words, the team mindfulness was no longer sufficient for group members to feel inclined to be self-reflective regarding their inner mental states.

The limitations mentioned above, either on their own or in combination, might explain why solitary doodling was unable to act as a measure for depression and anxiety in comparison to in-person, group doodling. As none of the participants provided sufficient detail to their comments about doodling and, in fact, seemed to lack insight into their doodling when having to engage in it on their own, conclusions that can be drawn need take these limitations into consideration.

5. Conclusions

Burnout has been recognized as a multidimensional occurrence including emotional exhaustion, a negative attitude towards work or clients and, thirdly, reduced personal accomplishment. When complaints of depression and anxiety are work-related, the diagnosis is burnout [42]. In a health narratives research group organized to appeal to those indicating work-related depression and anxiety, a possible way to measure the participants' change in depression and/or anxiety is intriguing. Pre-COVID-19, when the group was able to meet in person, doodling appeared to be a reliable measure for the depression and anxiety researchers had in relation to their work indicating their changing level of burnout. The question that has been examined here is whether doodling can reflect the psyche of researchers during COVID-19 when meetings were online and participants, if they did doodle, did so on their own.

What has been identified is that researchers encouraged to doodle under these pandemic conditions, when asked for their feedback, are positive about the activity of doodling. Nevertheless, few of them often doodled themselves. Therefore, it can be concluded that seeing the doodles of others posted to a private Facebook group was sufficient to make them believe they felt more relaxed in group participation online. However, when the doodles of those who had indicated their depression and anxiety related to work were examined, unlike the years pre-COVID-19, the doodles were unable to measure the changes in depression and anxiety expressed by these researchers.

There may be a number of reasons for the inability of doodling to persist as a measure during COVID-19. One reason could be the unsettling nature of the pandemic itself. A number of the researchers were front-line workers in healthcare and directly involved in serving those who tested positive for COVID-19. Under great stress, the reason many of the participants did not doodle over the 2020/21 academic year may have been mental exhaustion more than anything else.

On the other hand, as mentioned by some of the participants, doodling when alone is not the same as doodling in a group setting and it may have been the social nature of the doodling in the years before that made participants relaxed enough to tap their inner mental states through doodling. That attractive artists' materials were provided to participants in years before that were not available to these researchers when they doodled on their own is another consideration.

What can be concluded regarding the ability of doodling to measure the changes in depression and anxiety of members of the Health Narratives Research Group is that doing so during the limitations of COVID-19—although the participants themselves may have seen no difference in comparison with previous years—provides ineffective results for measuring depression and anxiety related to burnout in those researchers who doodle.

With respect to team mindfulness, this dual nature to the outcome of doodling in the setting of the HeNReG can be compared to the two dimensions of team mindfulness: receptive, open, and non-judgmental experiential processing; and aware attention to present perceptions [12]. During the years when the HeNReG was able to meet in person, both of these dimensions were evident in the function of the group. However, during COVID-19—when meetings were no longer conducted in person—the aware attention to present perceptions was lost to the group; although the receptive, open, and nonjudgmental experiential processing of the group’s interactions remained within the online meetings through the private Facebook group. This gives reason for why the participants believed that the doodling relaxed them and improved their interaction within the group while, at the same time, the doodles produced by those indicating depression and anxiety were unable to act as a measure of depression and anxiety related to burnout when the group met online only. Furthermore, the key component of aware attention to present perceptions that was lost in online meetings is likely the active listening [43] by the participants to each other’s in-person descriptions of their doodles.

During COVID-19 restrictions over the 2020/21 academic year, the private Facebook group was able to continue most of the interactions evident pre-COVID-19 when the group met in person. Yet, by being unable to replicate the aware attention to present perceptions, one of the two dimensions of team mindfulness, doodling behaviour by those expressing depression and anxiety was unable to measure these inner mental states. If what is required is active listening to the in-person sharing of doodles then it should not be expected that doodling can act as a measure of depression and anxiety in researchers when they are unable to interact in person. Regarding burnout, the online results of 2020/21 for the HeNReG show that, although doodling is unable to measure changes to depression and anxiety, doodling retains the ability to relax participants. This in itself is of value to reducing burnout in researchers participating in groups expressing team mindfulness, like the Health Narratives Research Group.

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