



# Doodling as a Measure of Burnout in Healthcare Researchers

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**Abstract** Burnout adversely affects healthcare researchers, their place of employment, and the production of valuable research. It is directly associated with symptoms of depression and anxiety. Having an easily employed and reliable measure of depression and anxiety in healthcare researchers is important if burnout is to be diminished. Doodling may be one such measure. Doodling became a possible indicator based on unexpected outcomes associated with one diverse and voluntary health narrative research group where doodling was introduced. The result, with respect to casual, self-reported levels of depression and anxiety, ranged from researchers expressing low levels of distress to those revealing clinical diagnoses of depression and anxiety. Changes to doodling execution and content, and their effect on the doodler—metrics previously unmentioned in the literature—hold promise for evaluating depression and anxiety levels of researchers. Maligned in academic settings with increasingly punitive outcomes, doodling should be reassessed as a possible indicator of internal states of distress, dysphoria, depression, and anxiety based on this University of Toronto Health Narratives Research Group result of doodling. Under certain well-defined conditions, variations in doodling may serve as a measure of change in these internal states and, therefore, act as an aid in reducing burnout.

**Keywords** Burnout · Doodling · Health narratives · Anxiety · Depression

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## Introduction

The World Health Organization (WHO 2019) officially recognized burnout in 2019 (Zoppi 2019) as a negative, job-related psychological state represented by symptoms such as physical fatigue, emotional exhaustion, and loss of motivation (Freudenberger 1974). Adversely affecting healthcare researchers, their place of employment (Heinemann and Heinemann 2017), and the production of valuable research (Schaufeli, et al. 1993), burnout is directly associated with levels of depression and anxiety (Haslam et al. 2005; Hakanen and Schaufeli 2012). Therefore, having an easily employed and reliable measure to identify levels of depression and anxiety in healthcare researchers is important if the incidence of burnout is to be diminished. Doodling may be one such measure.

Since 1959 and 1969, respectively, The Hamilton Anxiety Rating Scale and The Hamilton Rating Scale for Depression have been available as measures for these disorders. However, neither was designed (Hamilton 1959, 1960) for considering the continuum of distress, dysphoria, and depression (Tzeses 2020) that is evident in burnout. In searching for a simple, broadly ranging evaluation tool, doodling—an aimless scrawl made by a person while their mind is otherwise applied (*Oxford English Dictionary*)—may hold a key. Doodles, it will be shown, hold potential to directly gauge the range of disaffect associated with burnout (Pillay 2016) in a way that other indices do not.

The Rorschach Inkblot Test (Garb 1999) and Trimble's predesigned pictures of representational doodles (Trimble 1975) currently are available to assess mental states for this purpose. Yet, these tools for interpreting the psyche depend on standardized images doodled by someone else. In contrast, the type of doodles proposed here are ones based on the researchers' own spontaneous performance. As such, in being generated spontaneously, doodling differs from considering predetermined drawings. Yet, human figure drawing, previously used pervasively to access intellectual ability, is also generated spontaneously and has been found to lack validity (Imuta et al. 2013). Doodles, however, differ from prompted human figure drawing as they are found distinct from drawing to prompts. In the research presented here, it has been discovered that doodles created over a number of sessions, while the researcher is attending to a writing program, may in specific situations reflect accompanying changes in the psyche. It would be an important insight to learn that the changes produced are related to the work-related levels of distress, dysphoria or depression and to the anxiety in efforts to reduce burnout.

The discovery of doodling as a possible indicator for the levels of depression and anxiety experienced by healthcare researchers stemmed from noting unexpected outcomes associated with one health narrative research group. Since 2015, the University of Toronto Department of Psychiatry has sponsored the weekly Health Narratives Research Group (HeNReG) facilitated by the author through the Toronto Mount Sinai Hospital as representative of the university's Health, Arts and Humanities Program. The HeNReG allows researchers the opportunity to take the personally relevant stories that initiated their commitment to healthcare and develop them into narratives with a particular point of view. The process includes both

personal reflection in response to writing prompts and the willingness to share one's story and gain additional insights from the rest of the group. It is a voluntary, non-credit group open to any member of the university community pursuing healthcare research—one that encourages diversity of membership. Over these years, the group's process has aided members to doodle as they listen to the stories of the other participants and wait to pose questions to them. It is the result of these doodles with respect to casual, self-reported levels of distress, depression and anxiety that has been unexpected. Changes to the execution and content of these doodles, and changes in the effect they have on the doodler—metrics previously unmentioned in the literature—hold promise for evaluating the depression and anxiety levels of researchers.

### **Doodling: Educators' Views and Research**

Among educators, the status of doodling is controversial. Many would contest the notion that doodling might serve as a valid index of mental states that otherwise are difficult to evaluate. The common currency of educators is that doodlers are unable to concentrate on their work and likely to fail at written work because they doodle. These educators repeat their prejudice against doodling when doodlers appear not to be listening and when examining the written work of doodlers (Dicks, et al. 2018). Students are aware of and internalize educators' extreme prejudice against doodling. In a wikipost composed by 162 contributors, last updated on June 4, 2020 (How to annoy your teachers 2020), the 18 best ways to annoy your teacher were listed—doodling ranked number 7—higher than passing notes, or showing up late for class. This perception of doodlers as defiant rule-breakers has led to doodlers in US public school settings being arrested by police on at least three separate occasions for doodling (Khalek 2011, Gora 2015, Croucher 2018).

Accordingly, learners consider their need to stop doodling as something to master early in their educational careers. Doodling, when learners do engage in it, becomes anxiety-provoking for the doodler. The inability to find an acceptable outlet to doodle is both frustrating and a reason to adopt educators' views on doodling uncritically (Siebarth 2017).

The history of peer-reviewed research on doodling began with a study of over 9000 doodlers (Maclay et al. 1938). After a significant gap in publishing on doodling, doodling by nurses was considered (de Guzman et al. 2008). Subsequently, peer-reviewed publications on doodling became more frequent, beginning with the contribution of a test devised and implemented for doodling (Andrade 2009) and a *Lancet* study concerning doodling (Schotts 2011). Following these articles, the rate of publication related to doodling increased slowly but steadily from 2012 until 2019 (Chan 2012; Tadayon and Afhami 2016; Boggs et al. 2017; Burton and Baxter 2019 and Meade et al. 2019). In 2015, the 2009 test was replicated (Singh and Kashyap 2015). Nevertheless, over the more than eighty years since research began on doodling, these few articles represent the extent of peer-reviewed studies on doodling and demonstrate the paucity of publications on this

topic. Moreover, with respect to the information to be reported here, none of these publications has considered doodling as a valid measure of any internal state.

One can conclude from Maclay et al. that doodling is on a spectrum ranging from merely entertaining to relaxing to something crucial for work-place creativity. As such, how the doodler experiences their doodling makes a difference in whether the act of doodling will be relevant to measuring changes in their psyche. If the doodler considers doodling merely entertaining it is unlikely to reveal internal states. On the other hand, if the doodler feels they are able to relax from doodling, this would seem the ideal condition for an expression of mental states. In other words, the subject's belief in the therapeutic or self-empowering aspects of doodling may be a precondition of the use of doodling as a metric. At the other end of this spectrum, if doodling is essential to the doodler for their creative work then it is unlikely the doodling will demonstrate the workings of the psyche as the doodler will approach doodling with the attitude of a professional rather than that of an amateur. In assuming the attitude of a professional, those for whom doodling is essential for their creative work develop a social psychology of expertise where doodling becomes a reflection of their expertise rather than their current mental states (Mieg 2001; Eraut 1994).

These conditions may thus inform whether doodling has an ability or not 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. As such, it is considered that those who find doodling relaxing will be the participants whose psyche will be measurable through doodling.

The lack of research on doodling makes current results from the University of Toronto group valuable. Insights will be offered beginning with the year doodling first became a feature of the Health Narratives Research Group (HeNReG). The aim of presenting these results will be to discover the effect of doodling with respect to a number of variables: members' continuation with the group, how often they doodle, the effect of doodling on their narrative work, their choice of subject and mood they express when doodling, and changes the participants noted regarding self-reported anxiety and depression in relation to doodling—all potentially important parameters with respect to burnout. The progress from 2017 to 2020 of two doodlers in particular who considered doodling relaxing will be highlighted as examples of those who self-reported changes to their depression and anxiety levels and at the same time there appeared corresponding changes with their doodling. These results will be compared with the doodles of a participant who was merely distressed at the thought of being asked to doodle but, because of the non-judgmental atmosphere of the HeNReG, was able to relax and doodle. A comparison will also be made with a participant who thought of doodling as merely entertaining and another group member who included doodling as essential for their creativity. In both the latter cases, doodling was unable to measure the internal states of the researchers. It is supposed that it is because doodling did not produce a change in the relaxation level of the doodler—thought to be the key ingredient in revealing internal mental states.

## Structure of the Health Narratives Research Group

The HeNReG is unique. Its purpose is 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 particular point of view. The intention is to reenergize and sustain career-long research and decrease burnout from research-related anxiety and depression. In this regard, the group is responsive to the philosophy-as-therapy program initiated by Wittgenstein (1958) and since undertaken by others, such as Crittendon (1970), Peterman (1992), Hagberg (2003), and Heaton (2014), although there are no claims to the group being medical therapy. Two of the important features of the group include its diverse membership and the continuous developmental feedback method employed.

Those who take part in the Health Narratives Research Group are researchers willing to consider others their equals. They originate from various University of Toronto departments and 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 year, 2019/2020, the participants represented the following disciplines: Marketing, Social Work, History of Medicine, Developmental Psychology, Economics, Socially Engaged Art, Environmental Health, Education, Psychotherapy, Neuroscience, Immunology and English.

The discussion revolves around written responses to 5-min prompts, provided weekly by the facilitator; the responses are spontaneous and unprepared in advance. When the time is up, participants read their response to other members of the group one by one. The members pose questions to each other to help clarify what the member who is the current focus has written in response to the prompt.

The writing prompts follow a particular method over the academic year. The intent is to ask the conceptually simplest, most objective and least anxiety-provoking questions at the beginning and gradually move to those that are more conceptually difficult, subjective and contemplative. A simple, objective question that is unlikely to invoke anxiety is, "When did you begin your research?" A conceptually difficult, subjective question that would be more likely to promote anxiety (and is thus asked later in the academic year) 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 4 weeks, with "how" and "why" questions asked over 6 weeks.

While they are listening to a member read their response to the weekly prompt and while they wait their turn to ask a question of the reader, the participants are encouraged to use the readily available art materials to doodle. The doodling is understood to be something extra to do while they wait, and only if they choose. There is no requirement to doodle. The participants do not see their doodling as some kind of formal creation that will be assessed by others—it is entirely unmotivated and internally-driven. The doodles are shared, but only for information, not evaluation. Doodling is seen by participants as a way to pass the time while waiting to speak.

## Results of the Addition of Doodling to the HeNReG

Doodling was initiated following the previous introduction of drawing to prompts at the HeNReG meetings. Drawing to prompts began in the fall of 2016 based on the suggestion of one of the group's members. This first year, group members experimented with the various art materials available throughout the academic year in response to the drawing prompts (Wu and Rau 2016). Why these drawing prompts were not doodling is that they represented “art” produced for external consumption. Doodling, in contrast, once introduced, was produced with no intent in mind. The difference in results between drawing and doodling at the HeNReG meetings will later be made clear.

It wasn't until fall 2017 that doodling, in addition to drawing to prompts, was added extemporaneously by group members and continued because of participant interest. There was no direction given regarding what to doodle and participants who did doodle chose whatever they wanted to produce. Once doodling became an anticipated part of the group process, whether or not a drawing prompt was provided, all members were encouraged to doodle.

At the end of every meeting, all drawings and doodles were shared and described; they were not evaluated. Members shared and described their work for reasons other than the sake of critique. Instead, the purpose of sharing and describing was that the doodlers were genuinely interested to let others know what they had done. There were, in fact, a few instances where the doodler did not want to say anything about their doodle and this was also accepted. It was at these times of sharing that some group members, without prompting or unrelated to the matter under discussion, self-reported that doodling relaxed them, made them feel happier and helped them to concentrate on the responses of other members. As well, it helped them to formulate questions to ask other members about their responses.

Each week, the doodles (along with the written responses to the 5-min writing prompt and any drawings done to a drawing prompt) were collected by the facilitator at the end of the meeting, photographed, and then shared—with the comments about the doodles—on the private Facebook group established each year by the facilitator for documenting the HeNReG's academic year. At year end, the facilitator compared the doodles for the entire year with respect to a number of features: willingness to doodle, how doodling affected meeting attendance, doodler's frequency of drawing at meetings, range of subjects chosen and moods expressed, as well the influence doodling had on writing and how the doodles in the second year compared with the first year when only drawing was offered.

Why these features were chosen for examination related to the interest of the facilitator in retaining membership of the HeNReG. A lack of willingness to doodle was found relevant to members' intentions to leave the group. As well, members who persisted in particular subjects and moods expressed were more likely to want to continue with these themes at subsequent meetings and, thus, wanted to remain with the group. Furthermore, as creative writing was the focus of the group, whether doodling had any effect on the primary purpose of the group was relevant to the interests of the facilitator.

Additionally, the doodles of two members of the HeNReG who have been part of the group for a number of years were examined in detail in contrast to a newer member who, unlike the first two, did not express experiencing depression and anxiety. Providing further comparison to these two was one member who found doodling merely entertaining and another who saw doodling as an aspect essential to their creative work.

The first doodle (as opposed to response to a drawing prompt) produced (Fig. 1) was created spontaneously six weeks after the start of the 2017/2018 academic year. After creating the doodle, the researcher who produced it (self-reporting depression and anxiety) disclosed feeling more relaxed and happier. However, when it was suggested they also doodle, those with the greatest seniority as researchers felt inhibited being asked to doodle. And, once they did try to draw, they did not like the result of their efforts and were focused on self-critique rather than acceptance of what they had created. Whether it was a contributing factor or not, these more senior researchers who expressed anxiety in relation to doodling did not return to the HeNReG meetings after their first attempt to doodle (Figs. 2 and 3).

Another result of spontaneous doodling was that certain members who had been coming to the group sporadically now began to come regularly (Figs. 4 and 5). Others who had always come regularly began to stay late, after the meeting, to elaborate on their doodles. It was this group in particular who often voiced they felt happier doodling and less anxious (Figs. 6 and 7).

**Fig. 1** First doodle produced—researcher reported feeling happier and more relaxed



**Fig. 2** Doodle produced by senior researcher of a tree



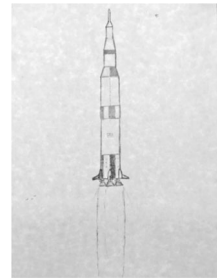
**Fig. 3** Doodle produced by senior researcher presenting his work to an audience



**Fig. 4** Example 1 of doodle by researcher who attended more regularly once doodling was added



**Fig. 5** Example 2 of doodle by researcher who attended more regularly once doodling was added



**Fig. 6** Example 1 of doodle by researcher who stayed late feeling happier and less anxious once doodling was added



## Participants' Frequency of Doodling

There were four divisions identifiable among the members of the HeNReG who doodled. The first group were those who never doodle and have not drawn since they were children (Fig. 8). The second group were people who used to enjoy drawing but had stopped once they began their academic careers (Fig. 9). A third



**Fig. 7** Example 2 of doodle by researcher who stayed late feeling happier and less anxious once doodling was added



**Fig. 8** Example of doodle by researcher who had not doodled since childhood



**Fig. 9** Example of doodle by researcher who doodled before beginning academic career



group had kept up their drawing skills but only drew occasionally (Fig. 10). The final group were those who drew regularly (Fig. 11).

It might be objected that these “doodles” are not really that at all, but deliberate efforts to create “art.” Although some of these doodles may look like planned art this is because most often, when people have the chance to doodle in other circumstances, they have very little time to work on their doodle and they are not encouraged to do so. In a setting where participants have 2 h to work on a doodle whenever they want and feel comfortable continuing with their efforts, as they do at the HeNReG, what may start off as just a squiggle can develop into what looks like a planned creation. However, it was clear from what people said in discussing their work that their creations developed as the time went on during each session and could change from one form to another during the time allotted.

It is interesting to note the more regularly the group member drew the less often they would comment on the doodling reducing their depression and anxiety. In other words, regaining a childlike ability to doodle seemed to be an important feature to reports of increased happiness and relaxation (it was these positive sentiments that

**Fig. 10** Example of doodle by researcher who sometimes doodles



**Fig. 11** Example of doodle by researcher who regularly doodles

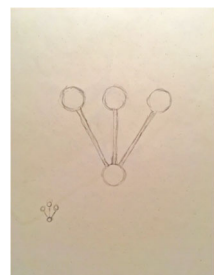


were voiced rather than their saying per se that they felt less, distressed, depressed or anxious).

## Range of Subjects

The range of subjects that the researchers chose depended on their feeling of relaxation at the time the doodle was produced. Those who were deeply involved with the content of the written narratives being produced and discussed concurrently were more likely to doodle shapes representing their thinking process during the discussion. For example, one researcher said he began with three different ideas about something and they merged into one (Fig. 12). Others who thought of the opportunity to draw as a welcomed invitation were more likely to doodle subjects that held personal relevance. These included drawings of space craft (Fig. 13), manga faces (Fig. 14), animals (Fig. 15), dinosaurs (Fig. 16), SpongeBob (Fig. 17)

**Fig. 12** Doodle of three ideas merging into one

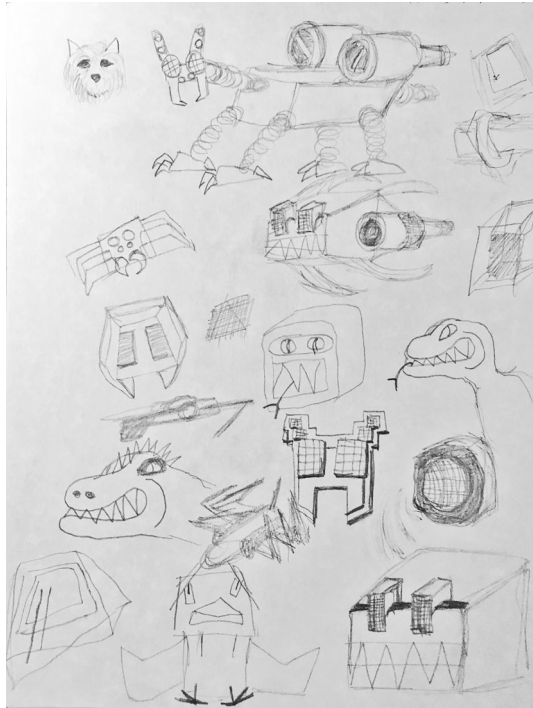


**Fig. 13** Doodle of spacecraft**Fig. 14** Doodle of manga characters' faces**Fig. 15** Doodle of animals

and cars (Fig. 18). One participant who revealed he was at the time suffering from anxiety and depression was reluctant to doodle but, when he did, preferred doodling monster faces (Fig. 19).

## Moods Expressed

The moods participants expressed from doodling were ones they acknowledged in comments made while the HeNReG was in progress. One group member who used to draw regularly as an adolescent remarked how happy doodling made her feel. (Figure 20). The next doodle shown was created by a woman who represented herself as extremely pregnant in her doodles. She said she was anxious about the thought of pregnancy (Fig. 21). Following that was a doodle done by a participant with depression and anxiety who indicated he was feeling depressed that day and this was a mask of himself (Fig. 22). The doodle of the pear with orange boots was

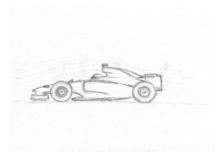


**Fig. 16** Doodle including dinosaurs

**Fig. 17** Doodle of Mermaid Man and Barnacle Boy from SpongeBob cartoon



**Fig. 18** Doodle of car



**Fig. 19** Doodle of monster face



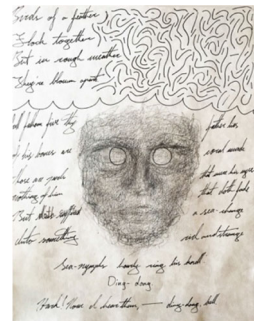
**Fig. 20** Doodle by researcher who said doodling made her happy



**Fig. 21** Doodle by researcher who was anxious about the thought of pregnancy

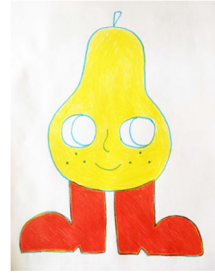


**Fig. 22** Doodle by researcher who indicated he was feeling depressed that day and this was a mask of himself



by the artist in the group who said she felt in awe of this character she had created (Fig. 23). The next doodle was by a group member who said he felt he was undergoing quite a lot and felt confused by his reactions (Fig. 24). The pathway

**Fig. 23** Doodle by researcher who was in awe of the character she created



**Fig. 24** Doodle by researcher who was undergoing quite a lot and felt confused by his reactions



**Fig. 25** Doodle described by the researcher as something playful

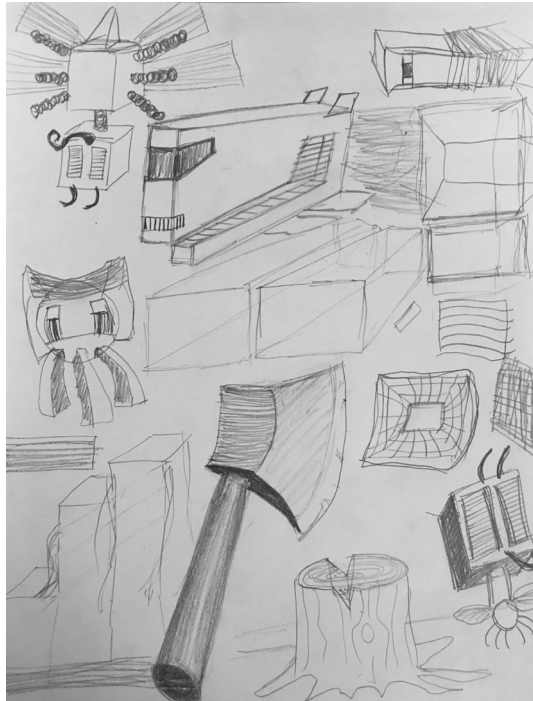


drawn that is also the trunk of a tree the doodler described as something playful (Fig. 25). Finally, when another doodler drew an axe he described it as something in him that is very powerful (Fig. 26). In each of these description of their doodles, what is interesting is that what was doodled by the researcher had no connection to the concurrent written narrative activities of the group. The moods that arose were ones outside the narrative discussion.

## Influence on Writing

As doodling is a peripheral activity of a group focused on writing, it is interesting to consider what effect the introduction of doodling had on the written responses to the prompts at the HeNReG meetings.

When doodling began to be encouraged at the HeNReG, one of the first type of comments voiced by the participants who were most eager to be invited to doodle was that doodling relaxed them and helped them to be more in touch with their intentions regarding their research. Doodling helped those who were reluctant to write spontaneously feel less inhibited to do so. An additional comment made by more than one group member once doodling was added to the HeNReG activities



**Fig. 26** Doodle described by the researcher as representing something powerful in him

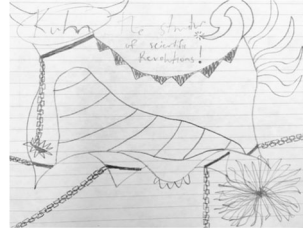
was that they felt more proficient in writing their responses to the prompt. Furthermore, they found the writing experience more enjoyable.

Participants also sometimes incorporated words into their doodle. There were a number of ways this might occur: to label a part of the doodle (Fig. 27), to inspire the viewer (Fig. 28), as a component of the doodle (Fig. 29), to explain something

**Fig. 27** Doodle where words label part of the doodle



**Fig. 28** Doodle where words are used to inspire the viewer



**Fig. 29** Doodle where words are a component of the doodle



**Fig. 30** Doodle where words explain something in the doodle



in the doodle (Fig. 30) or to redirect the viewer from the doodle to some other potentially more meaningful concern to the researcher (Fig. 31).

## Comparing Drawing with Doodling

Drawing to prompts had been initiated at the HeNReG during the 2016/2017 academic year. Doodling didn't spontaneously arise until the following year and, after that time, doodles were often undertaken as well as or instead of drawing to prompts. It is interesting to compare the difference between drawing to prompts and doodling, suggesting a methodological error in previous research where the subject was only ever told what to doodle. When group members drew to prompts alone, fewer participants were willing to take up drawing, believing that they lacked the skills to draw. Those who did agree to draw to the drawing prompts demonstrated



**Fig. 31** Doodle where words redirect the viewer from the doodle to some other potentially more meaningful concern to the researcher



**Fig. 32** Example 1 of a drawing to a prompt elaborating on one idea taking up the entire page focused on result



**Fig. 33** Example 2 of a drawing to a prompt elaborating on one idea taking up the entire page focused on result



**Fig. 34** Example 3 of a drawing to a prompt elaborating on one idea taking up the entire page focused on result



three features: their work consisted of an elaboration on one idea, they made use of the entire page to complete the drawing and they were focused on the result rather than the process of drawing (see, for example, Figs. 32, 33 and 34).

In contrast, the following year when doodling was supported and encouraged at the HeNReG meetings, the doodles produced differed significantly from the drawings of the previous year in the following ways: ideas arising freshly were placed in any available space, smaller drawings were put together randomly, and the

**Fig. 35** Example 1 of a doodle using space randomly focused on pattern details rather than cohesiveness



**Fig. 36** Example 2 of a doodle using space randomly focused on pattern details rather than cohesiveness



**Fig. 37** Example 3 of a doodle using space randomly focused on pattern details rather than cohesiveness



focus was on the process of developing pattern details rather than creating a cohesive product (see, for example, Figs. 35, 36, and 37). This demonstrates that doodling is in fact a more or less spontaneous expression of inner psychic states rather than an artistic production contrived for external consumption.

## Changes in Doodling Over Time

What is perhaps most relevant to considering how doodling reflects the psyche of the researchers participating in the HeNReG is comparing doodles over a period of time. The doodles of two participants who had both expressed depression and

anxiety will be examined. Both began membership at the HeNReG in the 2017/2018 academic year and have been part of the group each year following. As well, both told the group they were experiencing anxiety and depression related to their research and this was affecting their work. What differs between the two is the way in which their anxiety and depression evolved over the sessions. And what is extraordinary is how their doodles reflected what they had to say about their mental state at the time. It may be that the sessions themselves diminished their depression and anxiety. Yet the point is not that doodling causes the reduction in depression and anxiety (although it might in some way), it is that whatever the level of depression and anxiety of the researcher, the doodle reflected how the level changes over the course of the meetings.

Then we will turn from the researchers who expressed depression and anxiety to examining the doodles of those who did not. When a researcher described herself as nothing more than distressed, doodling was still seen to relax her and this was revealed in her doodle. In contrast, when the researcher was neither depressed nor anxious and saw doodling as merely entertaining, nothing was revealed of her internal state. Finally, there was the member who drew regularly and considered doodling a thoughtful practice essential for her development as an artist. As such, her doodles were a professional output rather than an expression of her psyche.

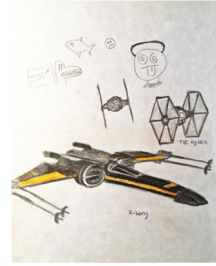
Let us consider the researcher who came to the group dissatisfied with his current area of research. He had wanted to switch his area of concentration but, until joining the group, he hadn't demonstrated the resolve to do so. As he was making the transition to his preferred area of research, a personal tragedy struck. This affected him significantly, causing worry about the time he believed he was wasting and the need to transform himself soon into who he aspired to be. Then, the depression began to lift and he started to feel more relaxed and even playful about his research. This is especially so since he had at this point completed work he considered destined for publication.

These transitions in his self-reported mental health were evident in his doodles. Initially, when he was depressed and anxious about his research, his doodles were of small, unrelated objects (Fig. 38). Then, as he transitioned to the new discipline for his research, he began to produce larger doodles (Fig. 39). After the personal tragedy, he produced a doodle of those he knew dancing around a black hole (Fig. 40). This doodle was notable because never before had he used black in this way on his doodles; nor had he drawn a group of people, or drawn stick figures. The same day, he also drew a page of colorful squiggles (Fig. 41). In describing this

**Fig. 38** Doodle of small unrelated objects produced when researcher indicated he was depressed



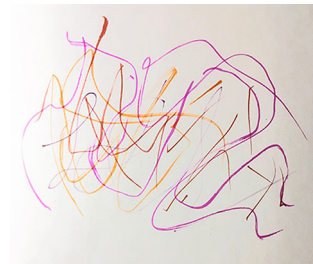
**Fig. 39** Doodle of larger objects when researcher transitioned to a preferred new discipline



**Fig. 40** Doodle of those the researcher knew around a black hole when he experienced a personal tragedy



**Fig. 41** Doodle of colourful squiggles the researcher said he “wasn’t feeling”



**Fig. 42** Doodle said by researcher to focus on space and time



colorful doodle, he said he had wanted to use the colors but “wasn’t feeling it.” Over the next few meetings, his doodles became focused on space and time (Fig. 42). When he initially mentioned that he was starting to feel better, he doodled his first abstract pattern (Fig. 43). Then, he started to focus on adding color to design (Fig. 44). Most recently, he has wanted to “have fun” blending colors

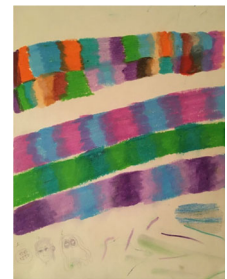
**Fig. 43** First abstract doodle by researcher once he said he started to feel better



**Fig. 44** Doodle where researcher started to add colour to abstract design



**Fig. 45** Doodle where research said he wanted to “have fun” blending colours



(Fig. 45). This desire is represented in his now larger-page doodles that are no longer confined to expressing identifiable content.

There was another researcher who was agitated and depressed with his lack of work progress when he joined the HeNReG. His thinking was complex and pulled together information from a number of disparate disciplines. At the same time, he was researching his own personal limits mentally and physically. For 2 years, he increased the breadth and depth of his research program, then he began to state that he was “running out of steam.” After this, the researcher mentioned that things were depressing in his research progress. One session, he arrived late in obvious distress, yet, he persisted at the group meeting until the end. Then, he did not attend again for 3 months. Once he returned, he began to recover and regain the ability to productively concentrate on his research again.

Similar to the previous group member, the mental state of this participant was evident in the doodles he produced. Initially, these doodles were composed of small parts that were arranged complexly (Fig. 46). Then, the day came he said he was

losing energy—his doodle reflected this (Fig. 47). As he began to note increasing depression, his doodles became more focused on wanting to expand in more than one location from one point upwards (Fig. 48). The session at which he arrived obviously ill (which he confirmed) was the first and only time his doodle involved using heavy black lines (Fig. 49). The first doodle he attempted once he returned after his absence included a number of interconnected ideas and colors as well as the use of a new medium (Fig. 50). He felt that with this doodle he was beginning to work things out.

The HeNReG member who first joined fall 2019 had not drawn since childhood and feared that she could not as a result of being ridiculed for her lack of talent when she as young. Her distress related to now being asked to do something she had been told by teachers was wrong for her to do. Yet, as a result of art materials being

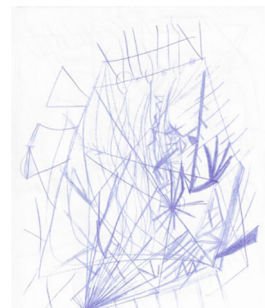
**Fig. 46** Doodle by researcher of small parts arranged complexly



**Fig. 47** Doodle when researcher said he was losing energy



**Fig. 48** Doodle when research said he had increased depression expanding upwards from one point



**Fig. 49** Doodle by researcher when obviously ill of only dark-lined doodle ever produced by this researcher



**Fig. 50** Doodle by researcher after recovering using colour and a new medium



**Fig. 51** First doodle by researcher anxious to doodle of her traced coffee cup



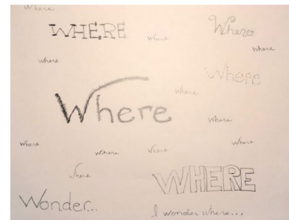
available and the non-judgemental nature of the group, she was able to develop as a doodler because she felt relaxed as part of the group.

Her first doodle (Fig. 51) resulted from tracing around her coffee cup and then coloring in the circles she created. At the next session, still anxious about being asked to doodle, she picked up a leaf on her way to the group meeting and then did a rubbing of the leaf for her doodle (Fig. 52). The next week, she did not make use of any props to create her doodle; however, she made use of the word “where,” which was the type of question beginning the writing prompt for that week (Fig. 53). It wasn’t until after the facilitator bought new sensually appealing art materials for

**Fig. 52** Doodle by researcher still expressing anxiety made by creating a rubbing of a leaf



**Fig. 53** Doodle by researcher without using a prop but focused on words rather than drawing



**Fig. 54** Doodle by researcher of spirals after a sensually appealing new material became available for doodling



**Fig. 55** Doodle by researcher expanding on her idea of spirals



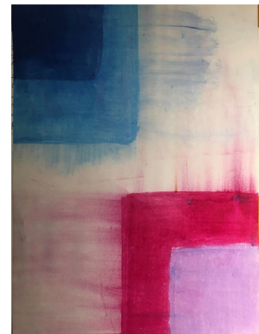
everyone's use that this participant started to doodle with more freedom. She used the buttery feeling crayons to make spirals (Fig. 54). The next week, she went further and stretched her spirals across the page and hinted at a larger, planet-like feature at the bottom portion of her page. (Figure 55). Regarding the last doodle in



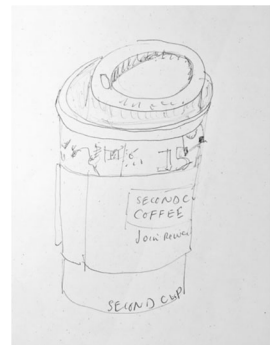
this series, she said it was because of the HeNReG that she has decided to become more creative (Fig. 56).

In comparison with the first three doodlers—whose revelations indicated their being on the spectrum of distress, dysphoria, and depression—the doodles of another member offer an instructive contrast. This member had been with the group from its inception and considers doodling a sideline from the more structured part of the group’s activities—the written narratives. She saw doodling as entertaining. There are only two types of doodles this member produced: reproducing what was in front of her, be it objects or people (Figs. 57, 58, and 59), and carrying out instructions for a procedure (Figs. 60, 61 and 62). In Fig. 60, for example, she started with a wavy line. Then, she drew the opposite wavy line on top of it. Once she added some colors, she then considered it looked like a caterpillar and decided to make another going the other direction. Having room to draw one more caterpillar, she did so, then she drew some dirt around them. This researcher did not appear to be affected by doodling and did not see doodling as additionally relaxing (she already felt relaxed). It can be surmised that in treating doodling as entertaining the doodling was unable to identify any changes to the emotional state of this researcher.

**Fig. 56** Doodle by researcher who said she has decided to become more creative



**Fig. 57** Example 1 of doodle by researcher of object in front of her



**Fig. 58** Example 2 of doodle by researcher of objects in front of her



**Fig. 59** Example of doodle by researcher of person in front of her



**Fig. 60** Doodle by researcher of squiggly line made into a caterpillar and repeating it twice more by reversing the caterpillar each time



The final set of doodles (Figs. 63, 64, 65, 66, 67 and 68) was created by the professional artist in the group. Her doodles were artistic experiments aided by a familiarity with her skills as an artist and the range of effects she could elicit from the art materials. In seeing doodling as imperative for her creativity, the artist acted as a professional engaging in an aspect of her trade rather than using doodling to reveal her emotional state. It is difficult to see her doodles as a metric.

According to the accounts provided by the artist at the time the work was produced, Fig. 63 represents thinking about new signage for the walking man and

**Fig. 61** Doodle by researcher of circles with lines connecting each circle using every colour to shade in the spaces between the connecting lines



**Fig. 62** Doodle by researcher of puzzle pieces expanding in size from the top right to the bottom left using a different colour to shade in each puzzle piece



**Fig. 63** Doodle by researcher that represents thinking about new signage for the walking man and stop symbol at street intersections and a new dynamic handicapped symbol

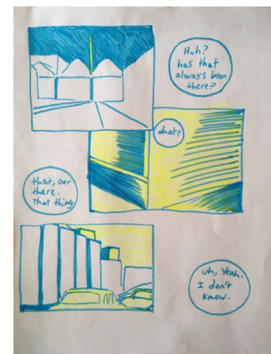


stop symbol at street intersections. In addition, the doodle included trying to devise a new dynamic handicapped symbol. For Figs. 64 and 65, part of the practice of the artist in creating comics is a focus on wandering through landscapes and through the urban areas using abstract forms with the aim of developing self-direction in geography. Figure 66 was said by the artist to be the “king frog character who actually acts on all the self-deprecating feelings that others only think about.” She wasn’t sure why she drew him jogging. Figure 67 is a character the artist was developing. Figure 68 represents three characters of a comic the artist was in the

**Fig. 64** Doodle by researcher of comic strip showing a character walking through a dense forest towards a fence with a hole



**Fig. 65** Doodle by researcher of an abstract comic with two narrators commenting on wandering through city structures



**Fig. 66** Doodle by researcher of king frog character who actually acts on all the self-deprecating feelings that others only think about



**Fig. 67** Doodle of character the researcher was developing



**Fig. 68** Doodle of three characters the researcher was in the process of creating



process of creating. None of the doodles produced by the artist were related to the either the writing prompts or discussions of the day.

## Discussion

Concrete insights have emerged from doodling at the HeNReG over a number of years. The doodles produced are a reliable indicator of changes in researchers' state of mind regarding their work under certain, well-defined conditions. Under the appropriate circumstances, the subjects chosen and the materials used by the participants for their doodles quickly determine whether the researcher is becoming more, or less, depressed and anxious regarding their research (from their personal insight offered during the meeting).

Use of entire page for the doodling (rather than just doing a number of small, precise, unrelated doodles) becomes a good indicator of the researchers' ability to concentrate productively on their research if they begin as depressed and anxious. When these researchers are able to expand from a focus on small, perfect doodles to expressing themselves over the entire page their satisfaction with their group participation increased. For those who weren't depressed and anxious, but still distressed, the doodling did permit them to relax and it was likely this feeling of being relaxed that encouraged a similar change in their doodles.

A comparison between spontaneous doodling and the drawings produced to prompts shows interesting differences. With drawing to prompts, the researchers focus on whether they want to decline to participate. This is especially the case if researchers feel reluctant to draw because of a belief that their abilities are sub-standard. This response was particularly noted in those researchers who were more senior in their research careers. For those who did draw to the prompts, the focus was on: successful choice of materials and technique, telling a cohesive story with the finished work and conforming to limits of the page size. Doodling, on the other hand, produced effects that were not noted in drawing to prompts. These effects included the following: interest in responding to the writing prompts increased, the ability of the participant to quickly ask and answer questions of others increased, and anxiety and depression casually self-reported was decreased. These effects were not noted in drawing to prompts, before doodling was introduced to the HeNReG.

The analysis of the doodles of this Health Narratives Research Group is more extensive with respect to various parameters than previous studies; there seems to be a relationship between reported anxiety, depression and distress and changes in

doodling practice. Nevertheless, the results from this study correspond to what can be concluded from the 1938 research on 9000 doodlers, that the effect of doodling relates to where, on the continuum of doodling (merely entertaining, relaxing or necessary for a researcher's creativity), participant views of doodling lie. Those participants in the HeNReG who found doodling to be trifling were more likely to leave the group once they were called upon to doodle. Those who experienced doodling as relaxing often stayed later to finish their doodles and were able to participate more fully in the primary aspects of the narrative work. Those researchers whose doodles changed in relation to their self-reported depression, anxiety or distress were the ones whose saw doodling as relaxing. In contrast, doodling was not seen to reveal the psyche if researcher's creativity was somehow dependent on the creation of the doodles or doodling was considered merely entertaining.

## Limitations

The major limitation of this work is that it was happenstance, which is to say, not undertaken purposefully; it might sooner be characterized as qualitative inquiry than research. Consequently, it may be questioned whether qualitative inquiry can develop a tool for measuring changing levels of depression and anxiety. With no initial hypothesis regarding doodling, the relevant patterns that were seen to form as a result of doodling were only recognized retrospectively, sometimes years after the doodles were completed, rather than hypothesized in advance.

Had the idea that doodling would be related to self-reported levels of depression and anxiety been considered initially, the materials provided for doodling might have been standardized and the number of drawing prompts reduced (as drawing to prompts was seen not to be related to the self-perception of the psyche). Nevertheless, it is notable that in spite of the deficiencies of the study the ability of doodles to represent the mental state of some researchers participating in the HeNReG was remarkable.

However, it needs to be considered that the reason why doodling was able to detect changing levels of depression and anxiety in those who felt doodling relaxed them may be just because doodling has been consistently forbidden in academe. Perhaps it was the encouragement of doodling in the Health Narratives Research Group, rather than the doodling itself, that brought with it the evident changes to the psyche. That this might be the case is reinforced by the finding that once group members expected to be permitted to doodle they were less likely to causally mention that they felt happier and less anxious.

Another limitation might be that rather than the process of doodling, it was the ability to make use of different art materials that many of the participants had never used before that encouraged their expression of happiness and feeling of being less anxious (Kaimal and Ray 2017). It is notable that the purchase by the facilitator of new, sensually appealing art materials gifted to the group made each of the members feel less inhibited to doodle and more joyful about the process of creation.

A final limitation of this work is that, because it was not undertaken purposefully, it is unknown what the results might have been had it been planned. It is likely that the results found in this one health narratives research group would not be reproducible if participants knew their doodles were related to a research study. The primary determinant of doodles being able to reflect the mental states of their creator has been found to be the ability of the doodler to relax as a result of doodling. Consequently, if participants had felt constrained in doodling, the hoped-for result would not have been evident. For this reason, attempting to recreate this research requires a very particular method, similar to the one promoted by the Health Narratives Research Group.

## Conclusion

Doodling has been maligned in academic settings with increasingly punitive outcomes in public education settings. Based on the evolving research on the value of doodling aided by the study of doodles produced at the University of Toronto Health Narratives Research Group, doodling should be reassessed as a possible indicator of internal states of distress, dysphoria, depression and anxiety under certain well-defined conditions as changes in doodling may serve as a measure of change in these internal states.

For doodling to become an important ingredient in reducing burnout in researchers, similar opportunities to participate with other researchers in egalitarian settings—along with paper and various art materials—need to be provided so that doodling production is aided. As well, the facilitator of these groups must be viewed by group members as trustworthy and supportive in encouraging doodling since the ramifications for doodling in other academic settings can be so severe.

In the meantime, educators would do well to consider doodling as part of the type of spectrum suggested by the 1938 article by Maclay et al. In this regard, doodling can be merely entertaining, it can be relaxing (thus able to measure depression and anxiety) or it can be crucial for creativity. If academics can tap into the mid-point of the spectrum for doodling that permits doodling to be relaxing, then this component likely can act as an aid to identify the levels of depression and anxiety—an initial ingredient to alleviate burnout and its detrimental effects in researchers.

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## Compliance with Ethical Standards

**Conflict of interest** The author has no known conflict of interest with respect to this work. The author is Scholar in Residence in the History of Medicine Program, a program associated with the Department of Psychiatry, Faculty of Medicine, University of Toronto. She has no direct, formal appointment to the

Department of Psychiatry, the Faculty of Medicine or to the Mount Sinai Hospital. The only incentive for those participating in the Health Narratives Research Group she facilitates is it being free of charge to participants. Since 2016, the author has been provided with three \$500 grants from the Health Arts and Humanities Program of the University of Toronto Department of Psychiatry for facilitating the Health Narratives Research Group. Pre COVID-19, weekly meeting space for the group was provided at the Toronto Mount Sinai Hospital through the Department of Psychiatry. The author receives no remuneration from the University of Toronto or the Mount Sinai Hospital.

**Consent to Participate** Members were provided with written information that the HeNReG was a voluntary, non-credit group encouraging diversity that members may join at any time. In responding to this written information by email, participants acknowledged their understanding that they were under no obligation to attend any specific number of meetings or to continue as part of the group.

**Consent to Publish** Approval to use the information pertaining to, and doodles of, HeNReG participants was granted by each member in email or Messenger responses to the author in agreeing to join the group upon being provided with the following information: “By joining, members agree their work may be anonymously referenced in presentations given and/or scholarly articles written by the facilitator regarding the yearly results of the HeNReG.”

**Ethics Approval** This is an observational study. Research Ethics Board approval was not obtained as there was no formal research undertaken and the author is not employed by either the University of Toronto or the Mount Sinai Hospital. Her facilitation of the Health Narratives Research Group (HeNReG) is on a volunteer basis. No participants were harmed as part of the HeNReG.

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