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Article

Enhancing Resilience Regarding Depression, Anxiety and COVID-19 with a Narrative Method of Ordering Memory Effective in Researchers Experiencing Burnout

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Abstract: Depression and anxiety are prevalent, persistent and difficult to treat industrialized world mental health problems. These disorders negatively modify an individual's life perspective through brain function imbalances, notably in the amygdala and hippocampus, and are primarily treated with pharmaceuticals and psychotherapy. Nevertheless, these mental health issues have only increased in the number of individuals affected and the intensity of their suffering—especially as a result of COVID-19 restrictions and fears. An approach to alleviating depression and anxiety in relation to researchers self-identifying as experiencing burnout is promising. Enhancing resilience, the approach considers depression and anxiety as consequences of the particular method people adopt in ordering their memories, and focuses on narrative development. The method encourages accepting of different perspectives as unique and necessary in creating safe protection from research burnout. Moving from an identification of personal character to prompting plot development of memory, the method promotes resilience by encouraging thoughtful reconsideration of the negative assessments by participants of their circumstances that can lead to depression and anxiety. The method of ordering and group members' feedback are inspected, including during the period of COVID-19 restrictions, and conclusions are offered regarding further research to encourage burnout resilience to diminish depression and anxiety.

Keywords: resilience; depression; anxiety; COVID-19; amygdala; hippocampus; burnout; research-ers; narrative; ordering memory

1. Introduction

In regards to mitigating depression and anxiety, the effectiveness of a unique and intriguing way of ordering verbal narrative is valuable to examine. Created to develop resilience, including in relation to the pandemic restrictions of COVID-19, this method can be assessed through the introduction of a number of interconnected attributes. The foundation of these attributes includes an initial description of depression and anxiety, and an examination of COVID-19—as a disease, concerning government responses to the pandemic and regarding its effect on depression and anxiety. The most salient issues in relation to the foundation of this method of ordering then can be discussed. These include: treatment of depression and anxiety, the brain regions involved in depression and anxiety, the contrast between memories produced by fear created in one brain region and those developed through narrative in another, protective narratives versus those that are traumatic, the role of resilience, character versus plot in developing resilient narratives, and the formation of resilient verbal narratives. Following the groundwork provided by this introduction, a particular method—found to be impressive in reinforcing resilience both pre and post COVID-19—will be presented along with suggestions for further research into this way of ordering that can be undertaken with the aim of reducing the burden of depression and anxiety, especially in relation to COVID-19.

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1.1. Depression and Anxiety

Depression and anxiety are prevalent, persistent and difficult to treat mental health problems in the industrialized world [1,2,3,4]. They are among the most common illnesses in the community and account for approximately 25% of general practice patients [5] with anxiety disorders the most ubiquitous group of psychiatric disorders worldwide [6] having a lifetime pervasiveness as high as almost 29% [7]. Depression is characterized by slow thinking, anhedonia, poor sleep duration and early morning awakening, along with mood swings [8], while the clinical features of anxiety are generalized worry related to a feeling of being on edge and irritable with difficulty in concentrating resulting in muscle tension and being fatigued, yet unable to have satisfying sleep. The symptoms of depression and of and anxiety must be unrelated to drug use or another medical condition (such as hyperthyroidism) for their positive diagnosis [9]. Although identifiable in all age groups, depression and anxiety are increasingly evident in children [10,11], most likely to become apparent in the late teens or early twenties [12], common post-partum [13], and often become more severe during old age [14]. When faced with these mental health problems, men are more likely suffer from tachycardia and constipation as well as abuse alcohol and other psychoactive substances [6]. Women, on the other hand, are seen more frequently to be: experiencing eating disorders, self-deprecating, socially isolated and suicidal [6]. Comorbidity of anxiety and depression is identified as a shared genetic vulnerability to both disorders, or by one disorder being a secondary effect of the other [15]. They are furthermore found simultaneously present with respect to poverty [16], chronic pain [17], loneliness [18], a fast life history (early development to produce and raise offspring) [19] and connected with Adverse Childhood Experiences (ACE) [20]. COVID-19 restrictions and fears have only heightened the problems associated with depression and anxiety and increased their complexity [21,22,23,24,25]. Problems related to depression and anxiety can be anticipated to continue even once the pandemic is over as the COVID-19 virus is expected to be endemic for years to come [26].

1.2. Pandemic of COVID-19

COVID-19 (Coronavirus Disease-2019) is the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus [27] that first became evident late 2019 in Wuhan, China [28]. 11 March 2020, it was declared a pandemic by the World Health Organization [29] prompting prophylactic self-isolation measures, including the wearing of masks [30]. The virus, spread by respiration droplets, is highly contagious [31]. Symptoms are various yet unpredictable in any individual—the most common being fever, cough, fatigue, and loss of taste and/or smell [32]. For those who recover, the symptoms can range in severity from being undetected by the infected person to being debilitating and persisting long after the infection is over in what has come to be known as Long Haul COVID-19 [33]. As of March 2022, over 462 million people had tested positive for COVID-19 and it had been listed as the cause of death for more than 6 million people worldwide [34]. Unexpectedly, the highest infections and fatalities have been found in the affluent industrialized countries—such as the U.S.A. and in Europe—where governments and populations did not appear to take sufficient disease control actions during the early stages of the pandemic, unlike in the poorer countries of Africa or Asia where the control response has been rapid and sustained [20]. By late 2020, various vaccines had been developed and were being actively administered world-wide [35]. However, even with dedicated international vaccine campaigns, the virus has continued to evolve, creating variants—the most contagious being Omicron with the most lethal being the Delta variant [36]. New variants have diminished the protective value of vaccines [37]. The number of boosters per person considered necessary for community protection has risen to three [38] with at least Israel considering four boosters the preferred dose for the immunocompromised [39]. Nevertheless, with the continuing change to the genetic constitution of the virus, health officials are beginning to question the viability of increasing the number of booster shots to contain the

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spread of COVID-19 [40]. This is especially so as countries, weary of the imposed limitations with respect to COVID-19, are beginning to abandon social isolation measures to regain a sense of normalcy [41]. In some industrialized countries, the call to abandon COVID-19 restrictions has recently become militant [42].

1.3. Government Responses to COVID-19

Since the declaration of COVID-19 as a pandemic, there have been various governmental responses [43]. For the most part, governments have followed the advice of their countries' healthcare specialists, relying on them to give direction regarding national decisions with respect to COVID-19 [44]. However, a minority of these countries' citizens have questioned the legitimacy of depending on the views of these non-elected officials—who base their advice on continually updated scientific studies—for devising COVID-19 policy [45]. Their response has been to undermine officially endorsed protective measures against the virus, both unintentionally and intentionally [46]. This includes refusing to wear masks [47] or receive vaccines [48], often concurrently; however, not necessarily [49]. Rather than being an instance of free-riding, as vaccine refusal has normally been considered, evidence suggests that citizens are more likely to refuse vaccines because of their perceived poor treatment by healthcare providers in the past [50]. Furthermore, the government sanctioned messages of healthcare officials provided on primetime television are regularly frustrated by the messages voiced by other media, including popular news programs [51], newspapers [52] and social media websites [53] seeking to present alternative positions—often spreading what is referred to as "fake news" [54]. In short, education regarding COVID-19 from various sources in response to government action is assessed by the public to be untrustworthy, confusing, changing frequently, and often contradictory [51,55].

1.4. Effect of COVID-19 on Mental Health

There is a general consensus that COVID-19 is not merely a physical disease but also one that affects mental health and well-being [56] resulting from loneliness, social isolation, changes to routines, domestic violence [57], loss of income, a lack of confidence in the information provided regarding the virus, discontent from travel bans [58] and the cancelation of elective surgeries [59]. Furthermore, those people of Asian descent particularly have suffered discrimination as representatives of the area of the world where COVID-19 was first detected, while healthcare workers have been stigmatized for their role in supporting and enforcing the continuing social restrictions [60]. Psychosocial consequences related to COVID-19 are considered likely to be most serious for four groups of people, those who are: aware they have been in contact with the virus; already vulnerable to biological or psychosocial stressors; health professionals; and obtaining virus-related information through numerous media channels [56]. The major contributing factor to the severity of mental health issues of each of these four groups is an intolerance to uncertainty [61]. The result is increased depression and anxiety among those most affected by these mental health and well-being challenges [62].

1.5. Etiology of Depression and Anxiety

Depression and anxiety are attributable to a fear of the unknown [63]—depression regarding a negative perception of the current situation in making future predictions [64] and anxiety related to looming future possibilities [65] that result from an interpretation of past remembrances, present perceptions and projected possibilities [66]. Depression, in effect, is the past tense of anxiety [67]. With perspective regarding time [68] as their primary differentiation, COVID-19 has resulted in an increase in both depression and anxiety as the thought of contracting the virus is frightening, the virus is itself unstable, the consequences of infection range from insignificant to life threatening, the effect on any individual is unknown, the demand for debilitating social isolation measures continues, and

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it is unclear who to believe regarding COVID-19 in what situation [69]. As these uncertainties regarding COVID-19 are found across the temporal spectrum, it is to be expected that symptoms of both depression and anxiety would be detrimentally affected [70]. This expectation has been realized worldwide [71] with the current situation in the industrialized world recognized to promote depression and anxiety by representing (in comparison) a previous period of intense gratification of needs pre-COVID-19 followed by a period of relative deprivation [72,73] resulting from post-COVID-19 restrictions. In one study, 36% of COVID-19 patients upon admission to hospital care had elevated anxiety symptoms and 29% had elevated depression symptoms [74].

1.6. Treatment of Depression and Anxiety

Treatment for depression and anxiety can be significantly effective [75,76]; however it is often unsuccessful [77] as the incidence of depression and anxiety, even apart from the effect of COVID-19, continues to increase along with the fear in the industrial world of not meeting societal expectations for living [78]. Displays of depression and anxiety are seen to relate to both disfunction in the amygdala [79] (specifically its basolateral nucleus [80]) as the region in the brain where such fears are automatically registered, formed and accessed [81], and a reduced volume of the hippocampus [82], the area of the brain that guides exploratory viewing and the creation of coherent memories [83]. Approaches that have been taken to address depression and anxiety have concentrated primarily on either changing the chemistry of brain function through pharmaceutical intervention or else quelling fears by encouraging coherent memories through psychotherapy [84]. However, recent evidence suggests that most if not all the benefits of antidepressants in the treatment of depression and anxiety come not from fixing a chemical imbalance but from a placebo response [85] and that memories also can be changed by direct brain stimulation [86]. Irrespective of the reason treatments may work, extinguishing fear is the target of the therapy. Fear is interpreted in the amygdala as a freeze, flight or fight mechanism [87]. The intention of the therapy is to stop the negative consequences from freeze, flight or the fight from reoccurring and engaging the affected individual to instead construct coherent narratives, including activating more adaptive emotions [88].

1.7. Primary Brain Regions Involved in Depression and Anxiety

Although there are a number of brain regions involved with respect to memory [89], most relevantly, memories conditioned by fear are stored and accessed in the amygdala [80] and represent non-verbal memories [90]. In contrast, the hippocampus is the site for the creation of safe narrated memories [91] when constructing time coherent verbal [90] stories that are personally relevant to the individual as episodic/autobiographical memories [92]. When memories take the form of safe, personally-meaningful, temporally-organized verbal narratives created and accessed in the hippocampus they are not simultaneously being organized in the amygdala, as the two brain areas constitute memories under separate conditions [93] and are accessed independently [90] (although, when memories are primarily invoked in the hippocampus, stimulation of the amygdala can improve memory without provoking an emotional response [94]). With respect to depression and anxiety, a person immersed in constructing and remembering a coherently-organized, safe, personally relevant narrative is not, at the same time, either depressed or anxious [95]. Consequently a way to treat depression and anxiety is to augment safe narrative memory construction in the hippocampus in contrast to directly reducing fear memories in the amygdala [96] that come with an intolerance of uncertainty [97]. This is especially so as the hippocampus is one of the few regions in the brain that can see new cell growth throughout adult life [98] and, with this growth, long-term changes can take place in the major synaptic pathways in the hippocampus [99]. Particularly during the COVID-19 pandemic, what this means is that a possibly more successful way to diminish depression and anxiety is to help affected individuals construct safe, temporally organized, personally relevant stories in the hippocampus in contrast to focusing on ways to reduce the fear of

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these individuals through treatments designed to change the chemistry of the amygdala and/or directly increase the size of the hippocampus.

1.8. Safe Versus Traumatic Narrative Construction

Yet narrative construction in the hippocampus is not always safe [91]. It can be traumatic [100]. What narrative construction looks like in life history evolves as the effects of fear memories accessed through the amygdala—in comparison with the hippocampus—assume decreased dominance in total memory recall [101]. The hippocampus, as the home of narrative memory development, constructs a range of memories [102] between those that are protective of the individual to those that are potentially detrimental. A memory is protectively safe when it does not support depression and anxiety [103] while those narratives at the other extreme, that promote these mental states, reinforce trauma [104]. What differentiates these narrative constructions is how the memories are arranged in the hippocampus [105]. This difference is evident, for example, in the change that occurs between how children store narrative memories and how adults—as those people with more experience in defining event boundaries [89] in the world in relation to their own interests—store theirs. Children—oversubscribed to the fears held in the amygdala [106] yet immune to the chronological nature of their narrated memories if they have trust in the omnipotent benevolence of their caretakers—story chronological details [107]. What this means is the narratives they construct are dependent on details of the actual timeline [108]. Self-aware adults, on the other hand, create narratives based on what they consider important to the story in relation to their personal values [109]. As such, the temporal details retain less importance and are often forgotten or misremembered—the difference between personally narrated episodic memory and semantic memory [110]. The result is that for the hippocampus to create safe narratives the individual needs to be clear on what they personally value rather than having an exact memory for semantic detail. This clarity provides them with the type of hope in relation to self-awareness that comes from participation in a personally relevant culture [111], rather than the hope of children in trusting attentive others who do not compromise the child's autonomy [112].

1.9. The Role of Resilience

The ability to develop protective narratives relates to the concept of resilience. Resilience is a process of effectively adapting to significant sources of stress or trauma promoting the ability to recover from adversity [113]. Previously thought to relate to the development of character in individuals [114], resilience is now recognized an interaction between an individual's problem-solving skills, temperament, relationships with family and support from others—not only a positive outlook in the face of adversity but also a process which amplifies this approach to adversity [115]. It represents qualities of the environment as much as that of the person [116]. To the extent that a child trusts their caregivers and their place in the world around them, resilience in children can arise primarily from stable, caring family relationships and support from others—creating and nurtured gratitude in the face of adversity [117]. In this regard, the narratives constructed by trusting children are those taught and exemplified by their supportive families and communities, particularly for those young people growing up in stressful environments [118]. This is a result of children internalizing their parents' socialization goals and ways of remembering into their own memory operations [119]. However, the adult in the industrialized world—as an independent, responsible member of society with the ability to work collaboratively—must evolve personal resilience primarily in relation to problem-solving skills [120]. In this way, even without the support of family and helpful social networks, the self-directed adult can display the type of resilience that is incommensurate with depression and anxiety. Resilience under these conditions does not require generally superior functioning from an appropriately developed character; what identifies resilience is relatively better functioning when solving problems in comparison with others experiencing the same level of stress or adversity [121] where the problem solving skills required for

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reliance involve narrative creativity, emotion regulation, and interpersonal collaboration [122]. COVID-19, in this regard, represents one such stress.

1.10. Character and Plot in Narrative Construction

Historically, creating these narratives has coincided with the idea of developing character [123]. Here, character has had a double meaning [124]. It is both the type of outlook that is resilience (to have character) and a persona the individual adopts to guide the creation of narrative (to represent a character). With respect to children raised in environments of trust, the character assumed is that of the good child [125]. As long as the child is good, they will be resilient within their community [126]. Adolescence brings with it the change from cared-for child to responsible adult. Within tribal societies, how that transition takes place is well-known to the community members and dependent on traditional cultural narratives [127]. The persona then adopted is that of the good tribal member. However, in the industrialized world, there are no clear and definitive roles that an adult must take on in order to join the larger society. Many personas are available as selves to adopt [128] and teenagers, in transitioning to adulthood, may and often do try and retain more than one [129]. Examples are the characters of hero, lover, adventurer, artist, spouse, protector, athlete, caregiver, leader and educator [130]. These are positive characters. On the other hand, if in adopting particular personas, the adolescent feels permanently thwarted from assuming the role of any of these socially acceptable characters, adopting a fast life history [131], they will then feel inclined to affect corresponding negative characters deemed morally defective [123], dark personalities [132]. Generally, these are categorized as the sadist, masochist, psychopath and narcissist [133]. The purpose of adopting either these positive or negative personas as a character is to demonstrate that, despite its many facets, the self is coherent and unified, demonstrating personal persistence and self-continuity [126]. Those who adopt more than one character, with an unstable sense of self, demonstrate traits of schizophrenia within industrialized society [134].

Although, regarding tribal societies, narrative development with respect to character produces resilience because the acceptable personas are well-known and supported by the tribal society [117], apart from the ideal environment of trust that may be experienced by children, the industrialized world does not produce resilience by narrative character development. Rather, to become resilient in the industrialized world an adult requires problem-solving skills related to what they personally value with respect to the life work they consider important [135]. It is the difference between individualistic understanding required by the adult in industrialized society versus the collective self-understanding of tribal societies [125]. As such, the resilient narrative of theses adults (as well as those children who do not grow up in an environment of trust and must become resilient on their own [136]) is not dependent on character; instead, it relies on plot development, where plot is what is personally valued by the individual in self-directing their life [137]. These plots can be considered as identity projects that are flexible and open to a number of possible selves [138]. They are dependent on abandoning character tropes for how to live life, becoming self-aware as a researcher into what one personally values, willing to work to achieve an internalized and evolving personal invention providing life with unity and purpose [139]. In this way, rather than trying to live life in the role of a particular character as one would in a tribe, the resilient person in the industrialized world must let their self-defined important work guide their narrative in living. The example of how this is accomplished is most notable for those people who have complete absorption in what they do, experiencing flow in their work [140]. With a well-developed narrative, even with the uncertainties of a pandemic, like COVID-19, people can remain resilient in their lives and hopeful regarding the outcome. Recognizing that hope has three dimensions: goals, pathways, and motivation [111], self-direction in relation to what one personally values in promoting flow in work resides within these three necessary dimensions.

1.11. Verbal Memory in Developing Resilience

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Our dependence on language means that wordless experiences must be made verbal to be integrated into consciousness and a coherent sense of identity as an autobiographical narrative [88]. Narrative processing and autobiographical reasoning here converge because the cultural forms that guide the creation of narratives influence the meaning or lesson to extract from a particular narrative unit [125]. For this reason, creating a narrative—based on what one personally values—demands self-awareness that comes from making this narrative verbal rather than felt but unstated [141]. It is in this way that the memories stored can relocate their creation and storage from the wordless amygdala to the narrative hippocampus and resilience can be developed to confront the depression and anxiety that has been amplified by COVID-19. The question is, does a specific way of ordering verbal narrative act effectively in mitigating depression and anxiety by developing resilience, especially in relation to the pandemic restrictions of COVID-19?

To attempt to answer this question, an approach to constructing personally meaningful coherent narratives promoting resilience for the purpose of reducing burnout with healthcare researchers will be examined. Burnout is a negative, job-related psychological state exhibited through physical fatigue, emotional exhaustion, and loss of motivation [142] arising from prolonged chronic interpersonal stressors associated with work and is particularly associated with the health professions [143]. It is directly related to symptoms of depression and anxiety [144,145]. The method to be examined was originated in 2015 and has continued each academic year through the Department of Psychiatry at the University of Toronto. The analysis will depend on historical narrative research of retrospective of data from group participants' feedback forms with an aim of investigating comparable participant views about the process with respect to expressions of depression and anxiety, both pre, and post, COVID-19.

2. Materials and Methods

The Health Narratives Research Group (HeNReG) is a method for promoting resilience in researchers created, facilitated and maintained by this author to appeal to those researchers who self-identify as having burnout regarding their research related to health. The group is designed to encourage participants to develop resilience by taking each participant's description of themselves in relation to the story that initiated their healthcare interest and, with the help of weekly writing prompts, evolve it into a verbal narrative with a particular point of view.

2.1. Features of the HeNReG

The group operates as an intentional community [146] defined by its philosophy and practice and is neither therapy [147] nor a research study [148]. The complete process of the group has been previously reported [149,150]. There are three identifiable features of the process with respect to promoting narrative resilience to decrease burnout—the group, the participants and the writing prompts. They can be tabulated with respect to the question-asking prompt types (when, where, who, what, how and why)—and the number of times the prompt type is posed—used during the HeNReG process itself. It is relevant to tabulate the features of the HeNReG to demonstrate the clarity that comes with this process, as seen in Table 1.

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Table 1. Features of three aspects of the Health Narratives Research Group (HeNReG) arranged in relation to the HeNReG process with respect to the type and order of the six different questions of writing prompts posed.

Questions related to HeNReG features	Group	Participants	Writing Prompts
When	Oct. – Apr. yearly	After seeing yearly ad	Composed each summer
	Real time—weekly, 2 hours	Contacted facilitator	Provided each week
	Virtually—anytime	After agreeing to terms	Offered after a response
	Feedback—twice a year	Convenient to participate	Access—Facebook group
Where	Dept. of Psychiatry	Occupational therapy rm.	Created—iPhone Notes
	Email communication	Home/office—COVID-19	Copied to Messenger
	Messenger app	Messenger account	Posted—Facebook group
	Private Facebook group	Private Facebook wall	Stored—Word file
Who	Have seen the ad	Come from any discipline	Created by facilitator
	Have facilitator contact	All stages of careers	Provided to participants
	Voluntarily want to join	Facilitator seen as equal	All members respond
	Those agreeing to terms	Members considered equal	Promote question asking
What	Dept. of Psychiatry offering	Feel burned out	Invoke values
	Health, Arts & Humanities	Unclear on their direction	Express current concern
	Free of charge	Willing to engage process	Redirect attention
	Community of researchers	Have time to devote	Are short questions
How	Ad in psychiatry newsletter	Read newsletter ad	Sent day before meeting
	Email to facilitator	Contact facilitator	Responses provided
	Facebook group created	Email agreement to join	Responses posted
	Members invited to group	"Friend" facilitator	Questions asked
	Google form feedback	Get Facebook invitation	New responses provided
Why	Create research community	Looking for community	Reveal personal values
	Enhance resilience	Want to decrease burnout	Create narrative
	Interdisciplinary	Open to other disciplines	To differ each year
	Mix career stages	Open, other career stages	Elicit current concerns
	Narrative development	To develop their narrative	Provide insight to others
	Feedback for model	To have an equal voice	To order memory

2.2. Materials

Pre COVID-19 restrictions, the HeNReG met in person in the occupational therapy room of the Toronto Mount Sinai Hospital's Department of Psychiatry. The space included a large table and enough chairs to accommodate twenty participants. Group members could choose to meet in person, online over the Messenger app or miss a week during the weekly two hour meeting. Once COVID-19 restrictions were in place, as of 12 March 2020, the HeNReG conducted its weekly two-hour meetings online in the private Facebook group space set up by the facilitator each year, and these included additional messages sent by participants directly to the facilitator by Messenger. Group members, both pre and post COVID-19 —whether they chose to attended any particular meeting—could participate any time during the week by asking and answering questions over the private Facebook group. At the very least, members could read the posts of each participant posted over the course of the academic year. The HeNReG continues to function online in this manner to date. The feedback forms sent to participants—both at the end of December and the end of April (the final meeting date of the academic year)—are created by the facilitator twice a year using Google Forms based on a model common to the Health, Arts and Humanities Program of the Department of Psychiatry. The data of the feedback forms are analyzed by the facilitator each summer with the intent of improving the HeNReG the following year in relation to the feedback received. The HeNReG has been slightly modified each year it has been offered as a result. The year immediately prior to COVID-19 and

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the years post-COVID-19 remain comparable, even with these slight modifications. The ways in which they are comparable have been highlighted in detail elsewhere [150].

2.3 Method

The method of the HeNReG is based on the presupposition that creating a mental landscape of what is considered true by participants in relation to what they value with respect to health is the optimal way to construct a robust narrative [151]. The reason for this assumption is that narratives are formed and accessed in the hippocampus [152]. As such, this stops creation of memories resulting from fear created in the amygdala or traumatic memory formation in the hippocampus elicited from burnout [153]. The transition from memory creation and storage in the amygdala to safe memory formation in the hippocampus begins in the HeNReG process with asking participants to initially describe themselves regarding their research related to health. In this way the tropes that are felt but not verbalized through memories created in the amygdala are accessed to offer a bridge from those fear-induced memories in that region of the brain to evolve to the verbalized narrative memories developed in the hippocampus, providing a high-level architecture [154] for these memories.

The question-asking can be visualized as a layered image following a pattern in constructing this landscape of truth. The initial description of themselves in relation to their research places the characters presented in their descriptions by each of the participants into an idealized space. The four 'when' questions, posed over the same number of weeks, create a one dimensional timeline for the characters in the landscape. The four 'where' questions pinpoint the characters' location in three dimensional space. Therefore, once the first nine weeks of the process are complete, the landscape has been figuratively drawn for the characters representing the group's participants in acting as avatars in this virtual space. The next eight weeks of 'who' and 'what 'questions place objects in the field of this landscape—the 'who' questions situate the valued people, while the 'what' questions place the treasured objects. Now the imagined landscape becomes similar to a virtual walk-through for a designed space. The next five weeks of 'how' questions permit participants to conceive routes through the landscape. The questions asked of them facilitate routes to the people and things each participant has placed in the landscape while the questions participants ask of others allow them to forge routes to the people and things placed in the landscape by other members. The final six weeks participants are prompted with 'why' questions. Up until these 'why' questions, the landscape created has been revealed uncritically by participants. With the introduction of 'why' questions, participants are given the opportunity to critique each aspect of the created landscape, its timeline, the three dimensional space, the "non-playable" characters (video game terminology [155]), accumulated objects, and the routes that have been devised—similar to using Google Street View [156]. In answering these prompted questions, the avatar of the participant's initial character description becomes a responsible actor in a personal narrative plot. The group members have at this point developed a complex and interrelated narrative defining them as their authors. Figure 1 is a stylized representation of this layering process.

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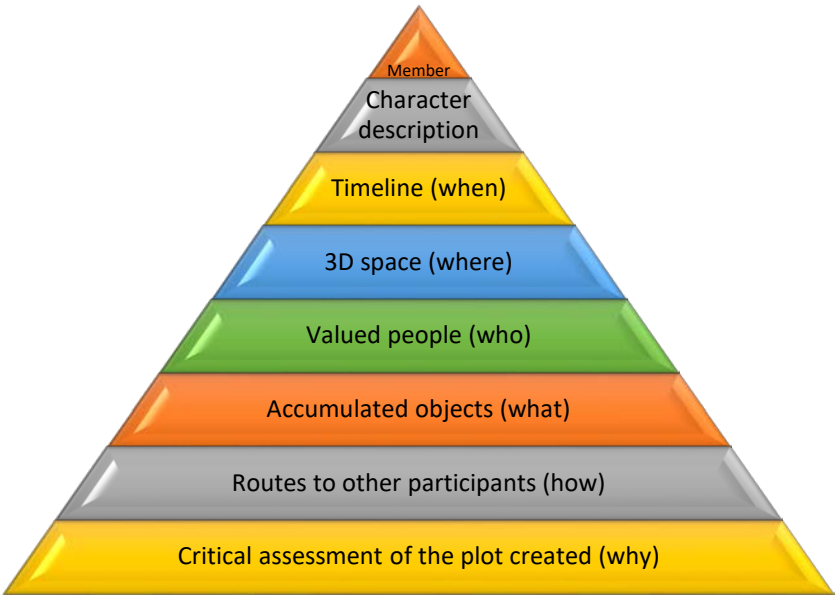

Figure 1. A stylized representation of the levels of the HeNReG process for each member including the initial description of the participant regarding their research related to health (character description) and the six different types of questions (narrative plot) that follow in constructing the landscape of truth. Answers provided to questions lower on the pyramid include a knowledge of the previous answers provided higher on the pyramid, explaining why in this depiction the base is increasingly wider as each type of question is subsequently asked of participants.

The initial writing prompt in the HeNReG process to determine the persona that the group member intends to assume as a participant is, "Describe yourself regarding your research related to health." As an example of the various writing prompts following this initial prompt that have been created over the years, Table 2 provides the prompts as they were presented by the facilitator over the twenty-eight week process of the HeNReG during the 2020/21 academic year—the first full year of COVID-19 restrictions—when the weekly two-hour meetings were held entirely online in the private Facebook group. It is notable that these questions refer to participants' "research related to health" rather than their "health-related research". The reason for this is that the researchers may come from disciplines other than those that are health-related. The point of the group is not that they are health researchers; rather, they are researchers whose topics of interest are related to health. Although the prompts change each year, they always follow the same pattern with the description coming first then the prompts asking questions in this order: when, where, who, what, how, why, with four weeks of the first four, more objective questions and five weeks for how and six for why—the increasingly subjective questions. The reason more of the subjectively questions are provided is that these are the questions that require the most insight to answer—an important factor to encourage through number of questions asked in developing a resilient narrative [157].

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Table 2. The writing prompts provided to the HeNReG members through the Messenger app over the 28 weeks of the 2020/21 academic year in the order in which they were presented to group members by the facilitator the day before the weekly meeting and to which they responded in writing through Messenger by the time of the weekly meeting.

Writing prompts provided to group members over the 28 week 2020/21 academic year
Describe yourself regarding your research related to health.
When have you felt overwhelmed regarding your research related to health?
When do you consider your research related to health ready to show others?
When is it time to move to a different aspect of your research related to health?
When have you felt yourself slowing down regarding your research related to health?
Where do you feel uncomfortable discussing your research related to health?
Where have you found important information for your research related to health?
Where do you initially turn if you have a problem regarding your research related to health?
Where do you go when you want to celebrate a milestone regarding your research related to health?
Who have you yet to reach with your research relate to health?
Who has helped you in developing your research related to health?
Who is the last person you would contact with respect to your research related to health?
Who gives you hope with respect to your research related to health?
What intrigues you regarding your research related to health?
What remains to be done of your research related to health?
What time of day do you feel the most productive in your research related to health?
What is most distracting to you in completing your research related to health?
How have you been improperly advised regarding your research related to health?
How would you like to be remembered regarding your research related to health?
How will you know you are done your research related to health?
How do you hope your research related to health will help humanity?
How can things go wrong with your research related to health?
Why would you want to be more inclusive in your research related to health?
Why would you change the way you approach your research related to health given the limitations imposed by COVID-19?
Why is your research related to health in need of an overhaul?
Why have you reassessed how you use technology regarding your research related to health?
Why do you think you haven't received the acclaim you think you deserve for your research related to health?
Why do you want a break from your research related to health?

3. Results

Although there are a number of ways that results might be examined with respect to this research method, those to be presented will correspond to the research question posed: Does a specific way of ordering verbal narrative act effectively in mitigating depression and anxiety by developing resilience, especially in relation to the pandemic restrictions of COVID-19? In addressing this question, the responses to the prompts provided by participants might be examined. However, doing so would require making assumptions regarding why participants responded as they did. This type of analysis goes beyond the intention of this retrospective study. Instead, the pertinent results will concern the year-end feedback that the participants provided regarding the HeNReG process. Given that each group member joined as a result of being attracted to a group aimed at researchers who felt burnout with respect to their research related to health, it is important to identify whether the participants felt more invigorated concerning their research once they had participated in the HeNReG process and whether the process was sufficiently robust that the HeNReG was able to achieve results comparable between pre-COVID-19 and post-COVID-19 years.

The feedback forms from three years—the full year before COVID-19 restrictions, the year COVID-19 required that the HeNReG no longer meet in person and moved online after 12 March 2020, and the first full year after the COVID-19 restrictions were imposed—

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have been examined chronologically in detail previously [150]. What will be novel in this analysis offered here is an assessment of that feedback using the HeNReG process of ordering itself. Rather than looking at the feedback as it was provided chronologically, this examination will group the feedback provided into when, where, who, what, how and why divisions. The three questions on the feedback form for which the answers will be interpreted in this manner are the questions that depended on short written replies as opposed to the multiple choice questions. These three questions are: How was the group valuable to you as a researcher? How might the HeNReG be of help to you in the future? 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 results follow in Table 3, Table 4 and Table 5, respectively.

Table 3. Themes mentioned in responses provided on the April feedback forms to How was the group valuable to you as a researcher? for each of the three most recently completed academic years in order of when, where, who, what, how and why responses from group members.

Order	Themes Mentioned in Feedback Forms	2018 2019	2019 2020	2020 2021
When	Allowed for a comparison of ideas with previous years of this group			1
Where	Gave a safe space to verbalize ideas about research	1	4	4
	Determined the direction I should go in my research		1	
Who	Provided the perspectives of other researchers	4	3	4
	Provided community and accountability in research			1
What	Enhanced my work as a narrative researcher	1		
	Invited a broader view of research	3		
	Helped in greater understanding of one's research	2	1	
	Challenged my thinking about research	1	1	2
	Sharpened thinking about research	2	2	1
	Encouraged self-reflection on research	4	4	5
	Engaged my curiosity and focus		2	
	Restfully cleared my thoughts regarding my research		2	
How	Offered a way to access my drives and motivations related to research		1	
	Reoriented my priorities regarding my research		1	
	Sorted out my problems with my research		1	1
	Presented a useful and easily employed structure for asking questions		2	1
	Decreased barriers in research			1
	Shared valuable resources			1
	Tailored the understanding of research to the researcher			2
Why	Reminded me of what is important and valuable in my research			1
	Motivated and inspired me with respect to my research			1
	Learned more about self-expression			1

Table 4. Themes mentioned in responses provided on the April feedback forms to How might the HeNReG be of help to you in the future? for each of the three most recently completed academic years in order of when, where, who, what, how and why responses from group members.

Order	Themes Mentioned in Feedback Forms	2018 2019	2019 2020	2020 2021
When	Continuing as part of the group in future years		1	
	Providing a comparison of results of the group over a number of years			1
Where	Expanding my research to other fields		2	1
	Including Zoom meetings			1
	Being a supportive community in a safe space			2
Who	Listening to others and giving feedback	1		
	Meeting additional interesting participants	1		2
What	Continuing with creative reflection	1		
	Making me more open minded	1	1	
	Keeping me updated on interesting topics in various fields	1	1	1
	Encouraging more collaborative artistic creation in my research	1		1
	Understanding and respecting different points of view	1		1
	Helping me plan my research	1		1
	Sharing resources	1		1

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	Increasing my confidence as a researcher		1	
	Learning more about various ways of expressing oneself creatively		1	
How	Opening up discussion	1		
	Offering different points of view	1	1	1
	Using the structure of weekly prompts to guide my self-reflection	1	4	5
	Reminding me to construct a narrative that drives my work		1	
	Practicing writing		1	
	Acting as a sounding board		1	1
	Going on with my research		1	3
	Clarifying what I value regarding my research			2
	Supporting network connections			2
Why	Decreasing my confusion about what should be my focus in my research	1	2	1
	Permitting me to grow as a researcher	1		1
	Coping with life challenges regarding my research		1	

Table 5. Relevant* themes mentioned in responses provided on the April feedback forms to Do you have other thoughts/comments on your experience as a participant in the HeNReG this term (especially as a result of COVID-19)? for each of the three most recently completed academic years in order of when, where, who, what, how and why responses from group members.

Order	Relevant Themes Mentioned in Feedback Forms	2018 2019	2019 2020	2020 2021
When	I wish I could come to the meetings more, but the group is in the workday	1		2
	The group is easily accessible for people with scheduling problems		1	
	Having a designated meeting time makes me take time to self-reflect		1	
	I hope COVID-19 ends soon			2
Where	I liked the option of participating remotely, I didn't have to travel	1	2	3
	Moving online was a smooth transition		2	
Who	The people brought together in this group are amazing		1	
	I miss the personal interaction now that everything is online		1	2
What	I had expected this was a creative writing group, but I easily shifted focus		1	
	I am thankful to express myself in a non-judgmental environment		1	
	It got me engaged with research during the lockdown			1
	COVID-19 affected my ability to participate			1
	I like the flexibility and structure of the group			2
	The year has been very isolating, this group was a great way to network			2
How	I would like to try to not use prompts	1		
	It would be good to have some exercises related to writing and art	1		
	Maybe we could include video chatting		1	1
	Fewer people responded to questions asked when we were entirely online			1
	I'm glad we did not use the videoconferencing format; it's too exhausting			1
	It would be nice to get tips for navigating the online platform			1
Why	This is a good program	1		
	A wonderful experience	1		
	I love this group!	1		1
	I love learning about other fields of research		1	

* Responses regarding themes not a focus of this article (doodling [158], and thanks given) but reported elsewhere [150] have been removed.

4. Discussion

In considering how the method of ordering research-related prompts might reveal improved resilience with respect to possible depression and anxiety that results from burnout, three years of feedback responses were compared—the year before COVID-19, the year COVID-19 restrictions were imposed mid-term, and the first full year of COVID-19 restrictions. Thus, the differences between pre-COVID-19 and post-COVID-19 responses can be assessed for significance. To make the comparison, the three questions requiring written responses from the common feedback form filled out at the end of each of the relevant academic years were ordered by the type of response provided and are found in Tables 3-5. For this discussion, the most frequent types of responses will be highlighted for each question over the three year period.

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4.1. How Was the Group Valuable to You as a Researcher?

For this question asked of researchers, the results of which are found in Table 3, there were two types of responses that were common over all three years. These were responses related to who and what type prompts. In other words, the important features that group members most frequently mentioned as providing value to them were the people who were part of the group and what occurred during group interactions. The specific responses in this regard were that the group provided the perspectives of other researchers and that the HeNReG encouraged self-reflection on research. In contrast, there was another response that became notable only once COVID-19 restrictions resulted in academic lockdowns. This was a where-type response—the group gave a safe space to verbalize ideas about research. What this points to is that although participants were still cognizant of the importance of who was in the group and what the group offered during COVID-19 limitations, they became more aware of the importance of the group offering a safe online space for meeting once they were unable to meet in person.

What is also interesting about the feedback offered by group members is that no consideration is given to either how the group functions or why with respect to its value to participants pre-COVID-19. It is only after the restrictions begin that any participant reflects on how the group functions as valuable to them. There are four types of responses provided to questions related to how the group functions that were first evident the year restrictions were imposed and these continued to be mentioned during the second year. Additionally, there were four more replies, grouped as how responses, provided only in the second year. With respect to replies that can be classified as concerning why the group was important to them, it takes the effect of more than a year of academic lockdown for any of the participants to consider why the groups functions as it does as important to them. There are the three responses participants provided in this regard: Reminded me of what is important and valuable in my research, Motivated and inspired me with respect to my research, Learned more about self-expression.

4.2. How Might the HeNReG Be of Help to You in the Future?

Examining how the HeNReG might be of help to participants in the future from Table 4, the year before the COVID-19 restrictions were in place obtained answers that focused on who, what, how and why. There are no responses that related to when and where. As well, there is no consensus regarding the way that the group might be of help in the future. With the lockdown imposed by COVID-19 came the first responses that considered when and where to be relevant to answering how the HeNReG might be of help in the future. These included continuing as part of the group in future years and providing a comparison of results of the group over a number of years as the responses that highlighted when the group would be of help. As well, there were three replies that could be grouped under where: Expanding my research to other fields, Including Zoom meetings, Being a supportive community in a safe space. The first of these relates to a conceptual space, the second, a virtual space and the third, a physical space. What is most noticeable regarding the feedback provided by group members once COVID-19 stopped in-person group meetings was that there was a convergence of replies that focused on using the structure of weekly prompts to guide the participants' self-reflection.

Of interest during the time when participants were not permitted to meet in person as a result of COVID-19 restrictions is that few of the participants mentioned a concern with being unable to connect in person. During COVID-19, the HeNReG conducted its weekly two-hour meetings online in a private Facebook group visible only to the group members. Yet, very few participants made any mention of feeling they required face-to-face contact in order to consider the HeNReG likely to be helpful to them in the future. In fact, there was only one person, during the second year of COVID-19 limitations, who felt that the meetings needed be conducted over Zoom in the future to be of help. This level of satisfaction with the online forum for the HeNReG meetings was unexpected, especially given that those group members participating in the 2020/2021 academic year did not

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meet face-to-face over the entire academic year. This could mean that: 1) the private Facebook group was accepted as sufficient for meeting, 2) participants believed they had more important things to give feedback on when asked how the HeNReG might help them in the future than thinking about meeting face-to-face, or 3) the participants didn't consider this question to be one that reminded them of their possible need to meet face-to-face in order for this group to be of help in the future. As there was no question devoted to whether group members considered the private Facebook group sufficient as a meeting space, which one of these things it could mean is not known.

4.3. Experience as a Participant in the HeNReG (Especially as a Result of COVID-19)

Table 5 provides the responses to 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 part of the question in brackets was added in the second of the three years, once the COVID-19 restrictions began. What is most interesting about the feedback provided to this question in its final, COVID-19-inclusive form was that, even when participants were given the suggestion to comment on their experience with COVID-19 in relation to the function of the group, only two members made any direct mention of COVID-19. One response made to the question could be grouped as when—wishing for COVID-19 to end soon, while the other response could be grouped as a what response in saying that COVID-19 affected the group member's ability to participate. This general lack of attention to COVID-19 when thinking about the HeNReG during the lockdown then reflects that there was little difference between the experience that group members felt they had in relation to the HeNReG pre and post COVID-19.

Given that COVID-19 is known to have increased depression and anxiety in healthcare workers [159], it was unexpected that HeNReG group members did not take the opportunity to mention the effect COVID-19 had had on their work as health researchers. As is evident from Table 5, there is little difference between the answers provided by participants to this question pre-COVID-19 and the replies provided post-COVID-19. So much so that, had it not been known there was a pandemic going on in part of the second and the entire third year accounted for in the table, there would have been no indication (except as noted above) that COVID-19 had a real effect on participants relationship to their health-related research. This pointing to a type of resilience that was gained from online weekly participation in the group is additionally supported by the response that was repeated most often—I liked the option of participating remotely, I didn't have to travel, indicating that one of the best features regarding the HeNReG was where it was offered, that is, online in a safe and private virtual space.

4.4. Limitations

The results of examining the April feedback forms of HeNReG participants for the last three full years of the group have provided a strong indication that, unlike the general trend in the industrial world [160], those health researchers who participated in the HeNReG did not show an increase in their depression and anxiety during the period they participated in this voluntary online group. On the contrary, the burnout that they likely were experiencing upon joining the HeNReG appears to have been lessened with the methodological ordering of their narrative through the use of the writing prompts beginning with words that followed the pattern of when, where, who, what, how and why. From the perspective of what might be going on in the brain, the thought is that, by redirecting focus from research-related fear to narrative ordering, safe memories were being ordered and accessed through the hippocampus rather than through the amygdala.

Nevertheless, there are limitations to considering the results in this manner. The first is that the feedback forms were not part of a designed study intended to answer the research question—Does a specific way of ordering verbal narrative act effectively in mitigating depression and anxiety by developing resilience, especially in relation to the pan-

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demic restrictions of COVID-19? Instead the feedback forms were created to provide information to the facilitator on how the group might be improved in the future. They were merely available for historical consideration extending to investigating whether they contained answers to the research question formulated once all feedback forms were in the possession of the facilitator. Furthermore, the interpretation of the three written answers on the forms presented in Tables 3, 4 and 5 is undertaken from the perspective of a historian conducting narrative research rather than that of a psychologist studying the effect of group participation or a neuroscientist in investigating changes in the amygdala and the hippocampus. As such, these results must be taken only as evidence, pointing to a direction for further research. In this regard, groups similar to the HeNReG would be set up and offered to those expressing research burnout for the deliberate purpose of seeing if they develop resilience [161] by creating an ordered personal narrative with respect to their research related to health. At the same time an appropriate, non-invasive test would be devised [94] to indicate the activity of the amygdala and hippocampus of each participant both before and after participation in these type or groups to see if, in fact, research-related memories were being stored and accessed in the hippocampus rather than the amygdala.

5. Conclusions

Depression and anxiety have become the most pressing health concerns of the industrialized world [1,2,3,4] and the pandemic of COVID-19 only served to increase the severity of these conditions [21,22,23,24,25]. The stringent and swift government responses to COVID-19 to contained the disease [43] had the effect of increasing fear in a number of ways and towards specific groups in the general population so that the result of COVID-19 on mental health went beyond fear of contracting the disease itself [56]. In recognizing both depression and anxiety as a fear of the unknown [63]—the former with respect to past and current matters [64] and the latter regarding possible future events [65]—treatment of depression and anxiety has been viewed primarily from the perspectives of changing brain chemistry directly through pharmaceutical interventions and indirectly through psychotherapy [84]. What has not been considered until now is redirecting how the person experiencing depression and/or anxiety orders their thoughts into a self-directing personal narrative focused on plot development rather than character through the use of a particular method of responding to writing prompts. Why looking to reorder thoughts in this way could be expected to be successful in dealing with depression and anxiety comes from considering the primary brain regions involved in depression and anxiety—the amygdala and hippocampus. Pharmaceutical treatment of these mental health issues has concentrated on either reducing the reaction of the amygdala [79], which records and accesses memories based on fear, or increasing the size of the hippocampus [82], where episodic memories are born and secured. Unfortunately, an increase to the size of the hippocampus is insufficient to abate either depression or anxiety as the hippocampus can create traumatic [100] as well as safe narratives [91]. The ability to develop protective narratives rather than traumatic ones relates to the concept of resilience [113]. Resilience comes from moving beyond the development of stable personal character [114]—the focus of psychotherapy [162]—to concentrating on ordering narrative through plot development [136]. Fears related to depression and anxiety remain housed in the amygdala as long as they remain non-verbal. To develop resilience, memories must become verbal [141]. How this was undertaken in a voluntary, equal access and supportive health narratives research group attractive to those experiencing burnout [141,142]—a psychological state directly related to depression and anxiety [144,145]—was the focus of this examination of the feedback provided by participants regarding their group experiences.

Results were obtained by examining the responses to three questions on the HeNReG feedback form completed at the end of the academic year over three years—starting with the year prior to COVID-19 restrictions and ending with the first full year of academic

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lockdown. These concerned the intellectual journey researchers were prompted to take in ordering their thoughts about their research from considerations that are most objective to those that are increasingly subjective through answering questions in the order of when, where, who, what, how and why. Their ability to lessen their feeling of burnout during both non-COVID-19 and COVID-19 years was evident and comparable from the feedback provided. This was true even though a number of HeNReG group members were part of those groups who were most discriminated against during COVID-19 and/or they were front-line health care workers experiencing exceptional demands on them during this pandemic [150]. Yet, rather than undergoing increased depression and anxiety as might have been expected, instead, they appeared to achieve the ability to construct safe self-directed personal narratives able to reduce their feeling of research burnout.

This historical study provides an intriguing and clear direction for potentially fruitful research in creating such safe narratives. What would be required for future research in this area is, 1) the development and testing of deliberate psychological studies using the method of ordered prompting devised with the HeNReG to construct safe narratives for the purpose of comparing resilience pre and post membership to the group, and 2) non-invasive neurological examination of the amygdala and hippocampus of those engaging in these research groups pre and post group participation. If the results of these type of studies of similar groups are able to show comparable abilities to create resilience as found with the HeNReG this method may be a new avenue for decreasing the incidence of depression and anxiety in the industrial world, especially in regards to COVID-19.

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Informed Consent Statement

Informed consent was obtained for publication from all participants in their agreeing to join the Health Narratives Research Group.

Data Availability Statement

Data available on request due to privacy restrictions. The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy restrictions expected by participants when they agreed to join the Health Narratives Research Group.

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Conflicts of Interest

The author declares no conflict of interest.

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