

# The Effect of the COVID-19 Pandemic on Confusion as the Primary Psychosomatic Symptom of Researcher Burnout

Carol Nash\*

Department of Psychiatry, University of Toronto, Toronto, Canada

## ABSTRACT

### Background

Uniquely, confusion represents the most reported psychosomatic symptom of one burnout reduction program. Several of the ten of this yearly program were during the COVID-19 pandemic's weekly meetings in a private Facebook group. For participants who reported confusion during the pandemic, this investigation assesses whether COVID-19 was an affecting factor.

**Keywords:** COVID-19; Psychosomatic; Burnout; Researchers; Confusion; Narrative Inquiry; Historical Analysis; Psychological Theories; DYMERS; Team Mindfulness

## INTRODUCTION

### Definition of Burnout

Burnout is an occupation-dependent syndrome arising from chronic workplace stress, energy depletion, or exhaustion. Its first description was in 1974 [1]. In 2019, the World Health Organization recognized that burnout results in mental distance, negativism, or cynicism by reducing professional efficacy and compromising work-related activity [2]. In 2021, a 50-expert, 29-country panel assessed 88 unique definitions, reaching a Delphi harmonized consensus that “occupational burnout or occupational physical AND emotional exhaustion state is an exhaustion due to prolonged exposure to work-related problems” [3]. A well-researched psychological phenomenon [4,5], burnout became a central focus of psychological research during COVID-19, with over 693,000 results generated from an author-conducted Google Scholar search of burnout on 30 September 2025.

### Investigating Research

Research is work that is creative, systematic, and intrinsically motivating [6], undertaken to increase and devise new applications of original, rigorous, and significant [7] knowledge [8]. The consideration is that it is original if it is novel within the standards of peer review [9] representing a primary goal of research [10]. Rigor requires intellectual integrity [11] in purpose,

methodology, results, and assessment to make it accountable [12]. Significance is an assessment that provides intellectually deep social value [13]. When limiting a Google Scholar search to “burnout in researchers” again on 30 September 2025, the returns amounted to only eight. Of these, the first four are publications by this author three peer-reviewed [14–16], and one pre-print [17] of [15]. Although [16] considers researcher burnout, it is the period before COVID-19. Relevant results from the COVID-19 pandemic for the eight included studies are two: [14] and [15] (see Supplementary S1). Modifying the search to “researcher burnout” produced 69 results. However, only 12 of these were empirical studies of researcher burnout during the COVID-19 pandemic, with [15] included among them (see Supplementary S1). Additionally, of these 12, seven alone considered the effect of COVID-19 on researcher burnout [15]. Thus, in total, there are nine publications [18–24].

### The COVID-19 Effects on Researcher Burnout

Table 1 presents the types of COVID-19 pandemic effects on researcher burnout in the nine publications. Notably, the reported effects are, for the most part, unique to the study. There are two publications each that mention a lack of team mindfulness [14,15], anxiety regarding no access to funding [18,23], and decreased mental health from delays [22,23]. Poor work/life balance was mentioned by three [21,23,24]. Additionally, three publications report three different symptoms [18,19,23]. These symptoms are exclusive to the study reported in

\*Correspondence to: Carol Nash, Department of Psychiatry, University of Toronto, Toronto, Canada, E-mail: carol.nash@utoronto.ca

Received: November 10, 2025; Manuscript No: JMHP-25-9917; Editor Assigned: November 12, 2025; PreQc No: JMHP-25-9917(PQ); Reviewed: November 14, 2025; Revised: November 18, 2025; Manuscript No: JMHP-25-9917(R); Published: February 05, 2026.

Citation: Nash C (2025) The Effect of the COVID-19 Pandemic on Confusion as the Primary Psychosomatic Symptom of Researcher Burnout. J Ment Health Psychiatry. Vol.2 Iss.1, February (2026), pp:23-33.

Copyright: © 2025 Carol Nash. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

[19]. There is a common symptom in the other two studies, [18] and [23]. What is evident is that no studies on researchers during the pandemic mention researcher confusion as a symptom of researcher burnout. This point is unexpected

because the self-descriptions, participant feedback forms, and Facebook entries of an author-facilitated, ten-year-old, yearly researcher burnout reduction program found confusion as the most common psychosomatic symptom associated with their burnout during COVID-19.

COVID-19 Effect on Researcher Burnout	Citation Number									
	[14]	[15]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	
Reduced doodling behavior	X									
Lack of team mindfulness	X	X								
Perceived need for academic misconduct			X							
Anxiety from no access to funding			X					X		
Higher stress and pessimism in women			X							
Increased risk of suicidal ideation				X						
Turnover intention				X						
Conflict with supervisors				X						
Poor coping with computer technologies					X					
Increased cynicism						X				
Poor work/life balance						X		X	X	
Decreased mental health from delays							X	X		

**Table 1:** The nine empirical studies on researcher burnout affected by COVID-19. They reveal twelve different effects. Most of the effects are unique to each publication. None of these publications identifies COVID-19 as affecting research confusion on researcher burnout.

**Description of Confusion**

Confusion was defined in 1990 as verbal or nonverbal disorientation regarding time, place, or persons in the environment, resulting in inappropriate communication or communication unusual for the person [25]. Confusion can be psychosomatic when associated with burnout [26,27]. Psychosomatic symptoms affect physiological functioning against the background of psycho-emotional stress [28]. One such stress is burnout [29].

Additionally, COVID-19 had a developmental effect on stress and worry [30]. Although there is extensive recent research on the relationship between psychosomatic conditions and burnout [31-35], no investigations consider whether COVID-19 causes burnout confusion in researchers as a psychosomatic symptom.

**Assessing the COVID-19 Pandemic-Offered Burnout Reduction Programs**

Over the ten years of offering the author-designed and facilitated program, two varieties helped reduce health researcher burnout during the COVID-19 pandemic. They were the Health Narratives Research Group (HeNReG), available online from the start of the pandemic [36] until April 2022, and the Health Narratives Research Process (HeNReP) a one-on-one online

offering from October 2022 until the end of the pandemic, May 2023 [37].

Previous publications on the HeNReG [14-16], the HeNReP [42], and both together [43] provide information on the content and operation of these interventions from 2018 to 2024 [38-41].

This work will not repeat these findings. Instead, this study aims to examine self-descriptions, feedback forms, and Facebook entries regarding the burnout reduction program to determine whether the participants recognized COVID-19 as a cause of their reported confusion.

The purpose is to provide an account of the effects of COVID-19 on researcher burnout concerning confusion as a psychosomatic condition in this program to establish literature on the results of researcher burnout during COVID-19.

**MATERIALS AND METHODS**

The materials for this study are in (1) two author publications (for the HeNReG from [15] and for the HeNReP from [42]). (2) the descriptions participants provided of themselves regarding their research related to health on the first meeting of either the HeNReG or HeNReP, (3) the last contact with the author/facilitator in the submitted online feedback form, and (4) during the course of either program in the archived Facebook entries submitted to the author/facilitator by the Messenger app.

The methodology to interpret these data is narrative inquiry. Narrative inquiry representing historical analysis investigates responses by participants regarding the effect of COVID-19 on their burnout as part of the author-facilitated program. The

materials are in publications, author-archived participant descriptions, feedback forms, and Facebook postings.

### Narrative Inquiry through Historical Analysis

Narrative inquiry has a dual purpose (1) as a methodology through historical analysis [43], and (2) as a conceptual framework that focuses on stories or descriptions of a series of events [44]. Although a consensus on narrative inquiry is lacking [45], there is agreement that it challenges accepted meanings by deconstructing values, assumptions, and beliefs [46] by representing a form of interpretative phenomenology [47].

Beyond merely describing experiences, it reveals their meaning by understanding the personal and cultural significance of participant experiences. Achieving this result to understand the co-constructed nature of the data analysis necessitates reflexive dialogue between the researcher and participant, with the researcher acknowledging their interpretative role in the research process. The individual is the unit of analysis unexpectedly uncommon in most psychological research methods [48].

### METHODOLOGY SELECTION

Historical analysis is employed to interpret the (1) self-descriptions participants provide at the start of each yearly program, (2) responses to the feedback forms provided by the participants at endpoints in both the HeNReG and the HeNReP, and (3) the Facebook entries of participant responses to the writing prompts sent to them over the 28 sessions.

The analysis concerns the content and structure of these records with a social and historical contextualization of their meaning [49]. For historical data interpretation, the chosen approach is the most common [50,51] chronological descriptive ordering [52].

This approach is selected to reveal relevant aspects of the records regarding whether (1) COVID-19 was a contributing factor identified by the participants who (2) recognized confusion as an effect of their burnout in (3) at least one of the three sources providing the data. The expectation was that this methodology would be fruitful because it was recently adopted for an analysis of burnout [53].

### Data Analysis Process

Considering the two publications by the author with data on the two programs, [15] and [42], (1) there was a counting of (a) the number of participants and, of these, (b) those who expressed confusion as noted in those publications, and (2) the author calculated the total participant percentage of those expressing confusion.

Regarding their health-related research, during the first meeting for both programs, the author/facilitator received participant self-descriptions. These were collated into a single document each academic year and distributed to all yearly participants. The intent in distributing this document was to help participants relate their session responses to the prompts that followed. To determine what participants wrote about themselves in these

yearly archived documents, the author examined each document of self-descriptions to identify any phrases by participants that indicated confusion regarding their research.

Once all 28 prompts had a response on ending the HeNReG or the HeNReP, the feedback forms examined were those completed by participants. These feedback forms were yearly online Google Forms created by the author/facilitator that each participant received. The feedback forms included a Likert-scale component for some questions. Other questions required a short answer. The relevant data for this study are the short-answer question responses.

Short-answer questions that may have provided responses relating research confusion were in the replies to three feedback form questions: (1) In what ways was the HeNReG(P) valuable to you as a researcher?, (2) How might the HeNReG(P) be of help to you in the future?, and (3) Do you have other thoughts/comments on your experience as a participant in the HeNReG(P) this term, especially as a result of COVID-19? To extract relevant data, the author read the answers from the returned feedback forms, looking for phrases expressing confusion.

The Facebook results are those transferred by the author/facilitator into the yearly-created private Facebook group for either the HeNReG or HeNReP. They are from the answers that participants sent to the author/facilitator through the Messenger app. On receiving them from each participant, the author/facilitator transferred them to the Facebook group. Verification of their transfer accuracy was by the participant on their posting to the private Facebook group.

To gather data on research confusion, the author accessed each private Facebook group, searching all the participant responses to “why” questions that the author recalled as expressing research confusion. As such, there may be additional replies to prompts on these Facebook entries throughout the 28 sessions that express confusion. Since the aim was to find examples of the acknowledgement of research confusion by participants, not to identify all possible instances, the consideration was that limiting the search of each of the private Facebook groups to responses to the “why” question was sufficient.

### RESULTS

There were 69 participants in the yearly burnout-reduction intervention over the pandemic years (see Table 2). The reports of confusion were from 28 participants. Per year, for the in-person HeNReG, the lowest percentage of those reporting confusion was 42% while the highest was 45%. Those who stated confusion diminished to 14% during the online HeNReP. Overall, 41% reported confusion regarding their research during the pandemic.

Parameters	HeNReG: 11 March 2020–2022			HeNReP	All
	2020	2020/2021[15]	2021/2022	2022/2023	2020–2023
# Participants	23	20	19	7	69
Confusion	10	9	8	1	28
% Confused	43	45	42	14	41

**Table 2:** HeNReG and HeNReP participants by academic year during the COVID-19 pandemic, the reporting of confusion, and the percentage of participants reporting confusion. For the HeNReG, at least 42% of the participants per year reported research confusion. Only 14% indicated research confusion during the pandemic for the one-on-one HeNReP. None who reported confusion as a symptom of their burnout in at least one of the ways archived indicated that COVID-19 was a factor in creating or prolonging their confusion.

Source: For the HeNReG from [15] and for the HeNReP from [42].

The reports of confusion were 28. However, these were from 19 participants (Table 3). All participants in the program were able to return to their research at the end of the program as a consequence of the narrative intervention. Seven of the participants who reported confusion reengaged with the program at some point during the pandemic years to reduce their burnout again.

Participant	HeNReG: 11 March 2020–2022			HeNReP
	2020	2020/2021	2021/2022	2022/2023
1			X	
2			X	
3	X			
4	X		X	
5	X	X	X	
6	X	X		
7	X	X	X	
8		X	X	
9	X			
10	X			
11	X	X		
12	X			
13	X			
14		X	X	
15		X		
16		X		
17		X		
18			X	
19				X

**Table 3:** Pandemic years participating in the burnout reduction program for those reporting confusion. Although there were 28 reports of research confusion, they were of 19 different participants. Several participants expressed their confusion when participating in two or more of the yearly programs.

HeNReP. T Participant numbers arranged by attendance since 2015 in the HeNReG or HeNReP, rather than the pandemic years alone.

Source: Data from yearly self-descriptions provided by each participant, archived by the author/facilitator. Participant numbers arranged by attendance since 2015 in the HeNReG or

No long-term alleviation of research confusion accompanied burnout-reduction program participation. However, their burnout reduction was sufficient for participants to consider that engaging in the program again would be helpful to them in this regard.

to comment on their health-related research. The entry point into the program (self-description) and the exit (feedback form) were opportunities for researchers to comment.

Also, participants at times reflected on their research

Throughout the intervention, participants had the opportunity throughout the intervention (in answer to prompts recorded in the yearly private Facebook group). Tables 4-7 present examples of the participants expressing research confusion in their descriptions, feedback forms, or from the Facebook group.

Part. #	Participant Comment	Source
3	By having a space to talk about my research through people asking questions to further clarify what my research is focusing on allowed me to better understand my ideas through perspectives I had not considered on my own.	Feedback
4	My research in respect to health has always been trial and error. For those that have followed my journey for a while, you've seen me do a lot of different things but never followed up on whether my projects had success or failure.	Description
5	I am someone who underwent personal trials and tribulations.	Description
	The HeNReG gave me perspective.	Feedback
6	The HeNReG helps me reorient my priorities and objectives in my research.	Feedback
7	Having weekly questions allows me to challenge my research process in ways that I would not be able to by myself.	Feedback
9	The HeNReG allowed me to talk about problems in my research. Talking helped me sort out problems.	Feedback
10	While being eager to get involved and make my mark, stumbling blocks thwart my efforts.	Description
11	In the future, the HeNReG might allow me to stay focused.	Feedback
12	Inspiration, random and constant. Productivity, cumulative and orderly. Doing, not thinking. Sometimes, in order to continue to communicate with others, you have to lose more effective ways that you have been able to communicate before.	Facebook
13	I still feel very far from what it means to 'do research' or to be a 'researcher'. I want to know what the way is. I wanted to join this group, because there should be a starting place for all these ideas to grow and slowly connect with one another.	Description

**Table 4:** Participant number (Part. #), participant comments regarding their confusion of those who reported confusion during 2020, and the source of the comment. These reflections suggest cognitive dissonance as a psychosomatic condition rather than pandemic-induced confusion.

Source: Data from yearly self-descriptions provided by each participant, feedback forms, and Facebook entries archived by the author/facilitator. Participant numbers arranged by attendance since 2015 in the HeNReG or HeNReP, rather than the pandemic years alone.

Part. #	Participant Comment	Source
5	I want to address communication ease, preparation and anticipation.	Description
6	The HeNReG helps me introspect and talk about my research	Feedback
	Everything regarding my research is more energy consuming.	Facebook
7	The HeNReG always allows me to challenge my research and think about it from different angles. I have a better grasp of how to ask and answer questions.	Feedback
	Sometimes I feel stuck. I'm not sure how this research will really progress forward.	Facebook
8	I had wonderful years as a researcher in Latin America. Now, I am unsure how to reflect on that experience, maintaining my contacts in Brazil, Chile, and Colombia.	Description
	Clarifying my thought is the main objective.	Feedback
11	I am still deciding what to research in the months to come... I look forward to this HeNReG as a chance to stay focused.	Description
14	I want a deeper exploration of my mental health.	Description
	The HeNReG provided opportunities to reflect on challenges and consider my work and approach to my work from different perspectives.	Feedback
15	I need to maintain my mental health to keep me motivated for doing research.	Description
	It's clearer for me to know what my value is.	Feedback
16	My research can be very frustrating and ego-defeating.	Facebook
17	I don't know how to incorporate my research into my daily routine.	Description
	The HeNReG helps me to focus on what truly matters and allows me to take action towards my research despite how small of a step it might be.	Feedback
	Research feels like work (or maybe because I've just lost interest in my topic) and I've been procrastinating really hard at the moment.	Facebook

**Table 5:** Participant number (Part. #), participant comments regarding their confusion of those who reported confusion during 2020/2021, and the source of the comment.

Source: Data from yearly self-descriptions provided by each participant, feedback forms, and Facebook entries archived by the author/facilitator. Participant numbers arranged by attendance since 2015 in the HeNReG or HeNReP, rather than the pandemic years alone.

Part. #	Participant Comment	Source
1	I have unfinished business that I don't know how to finish regarding my research related to health	Description
2	Describing myself feels strange at the moment. I'm not sure I'm being very clear here.	Description
	I did notice that the questions were signaling for me when I'm lacking patience - especially when there's an important question and I don't know the answer and instead of searching through writing I'm spiraling into vicious cycles.	Feedback
	Sometimes I lose my balance and start doubting myself and my research	Facebook
7	I'm just wanting to ensure my research is worth pursuing. Am I asking the right questions, is it going anywhere?	Facebook
8	I am now focused on my past, not my future.	Facebook
11	I think right now the research is how to cope with my position, figuring out protocols for going off into the deep-end (Twilight Zone-esque stuff), and putting it into writing.	Description
14	Though organizing and scheduling can be challenging and skills can be learned to aid in reaching goals in this area I continue to struggle. My brain has difficulty with time.	Description
	The HeNReG helps me with working through fears of expressing and communicating in writing.	Feedback
18	My research is slightly haphazard, with no particular order or organization to it.	Facebook

**Table 6:** Participant number (Part. #), participant comments regarding their confusion of those who reported confusion during 2021/2022, and the source of the comment.

Source: Data from yearly self-descriptions provided by each

participant, feedback forms, and Facebook entries archived by the author/facilitator. Participant numbers arranged by attendance since 2015 in the HeNReG or HeNReP, rather than the pandemic years alone.

Part. #	Participant Comment	Source
19	I generally allow myself to go where my interests take me, I move between disciplines a lot.	Facebook

**Table 7:** Participant number (Part. #), participant comment regarding their confusion of the participant who reported confusion during 2022/2023, and the source of the comment.

Source: Data from yearly Facebook group, archived by the author/facilitator.

Notably, none of the participants mentioned the pandemic as the cause of their confusion. To be considered is why.

Participants might not have mentioned the role of the pandemic in their research confusion because their focus in answering the

question was not the effect of COVID-19. For this reason, it is revealing that when questioned whether they had comments regarding the result of COVID-19, for those participants who answered this question, still no participants cited the pandemic as relevant to their research confusion. Six of the nineteen participants who expressed research confusion did not answer this question when provided the opportunity. Of these, four did not complete the feedback form. In contrast, two others completed the form but chose not to answer this question. It was their only question without a response. It is significant that although the researchers had research confusion, their responses

to a question about the effect of COVID-19 lacked confusion. In contrast, the participants expressed a positive frame of mind and assessed the process objectively. These reflections by participants suggest cognitive dissonance rather than pandemic-induced confusion.

## LIMITATIONS

This study has several limitations. One researcher created and facilitated the intervention, recorded the comments, archived the materials, and conducted the assessment. The informed consent provided by the participants makes the data private, permitting only anonymous reference in publications. Additionally, not all participants, when provided the opportunity to respond, answered whether COVID-19 affected their research.

## Future Research Directions

Future research on similar COVID-19 timed burnout-reduction programs is necessary to determine whether researchers expressed confusion regarding their investigations. If so, whether they stated any effect of the COVID-19 pandemic on their confusion is relevant. As pandemic conditions are over, this type of research must be historical, examining data recorded by the organizers of these programs. The point of these interventions may not have been to investigate researcher confusion, and even if recognized, the significance of confusion regarding burnout may not have been evident. Currently, few studies reexamine psychological data collected during the COVID-19 pandemic for additional insights [56–58]. Yet, such reexaminations do exist, demonstrating the possibility.

The significance of research confusion for the researchers who participated in either the HeNReG or HeNReP suggests that research confusion is a prominent issue for researchers that requires alleviation beyond considerations of pandemic effects or, perhaps, even burnout. Investigating this matter may be most productively accomplished by an examination through psychological theories.

## Psychological Theories

One applicable theory is self-efficacy. A 2015 examination of research confusion [47] argued that sense can be made of this confusion in an introductory physics class through the perspective of self-efficacy theory. Support for this research direction is a 2023 publication regarding confusion in post-secondary students [48]. Yet, however similar, students are not career researchers. Therefore, two recent studies of career researchers that consider the value of self-efficacy theory in interpreting research confusion are more relevant [49,50].

Another psychological theory that may be effective for investigating research confusion is coping theory. It is one used frequently regarding burned-out healthcare practitioners during COVID-19 [51,52]. In process-related coping theory [53,54], coping is a relationship between the objective environment and individual focus. The basis is the 1985 presentation of process-related coping by Lazarus [55], including a 1993 refinement by the same author [53]. From the adopted point of view, the individual cognitively appraises the sensed environment. If the

appraisal is negative, the selection is between emotion-focused and problem-focused coping responses, although these foci are not exclusive. The use of several coping strategies can be simultaneous [56]. Once the pandemic prolonged, the emotion-focused coping that oncologists (for example experienced was detachment [51]. However, this coping strategy was not one used at the beginning of COVID-19. Problem-focused coping was the first form of coping. These methods lack investigation for research confusion with burnout—they may be relevant.

Burnout represented a significant problem for all employees during the COVID-19 pandemic. Mental healthcare practitioners [57], nurses [58], gig workers [59], corporate professionals [60], and working parents [61] were the focus of the studies, investigating whether experiencing the psychological flow investigated by Csikszentmihalyi might avoid it. Psychological flow was found to be a form of mental immunity to burnout, similar to biological immunity [57] statistically significant in quantitative studies and promising for mitigating burnout in qualitative ones [62]. With the result of burnout avoidance, psychological flow was possible during COVID-19 for various employee types [62]. This outcome suggests that focusing on achieving flow in the workplace during pandemics would diminish the incidence of employee burnout. Whether attaining psychological flow would reduce research confusion has yet to be investigated.

The act of researching may itself produce confusion by questioning values with, for example, traditional religious understanding and practice. About the increasing role of AI in research, this confusion may be especially concerning regarding religious experience and psychological behavioral patterns [63]. The results of this study suggest that research on spiritual confusion requires frameworks of individual religious psychology with institutional adaptation to the technological change created by AI. Simultaneously, developmental patterns that influence spiritual-technological integration require acknowledgment. However, psychologists receive little or no training in spiritual issues, partially because there is no agreement on spiritual competencies or training guidelines [64]. Developing such competencies and training guidelines is necessary before the relationship between research and spiritual confusion, as an aspect of researcher burnout, can be studied for soundness and validity.

## DYMERS

Dysregulation of Mood, Energy, and Social Rhythms Syndrome (DYMERS [65] is the term for the combination of poor sleep, behavioral, and social rhythms that affects burnout levels. During the pandemic, healthcare professionals were the focus of DYMERS investigations [66]. From this perspective, research confusion may be more a function of poor biological/social rhythms than psychological disturbances. COVID-19 altered these rhythms [67]. Therefore, although the HeNReG and HeNReP participants during the pandemic did not consider COVID-19 as a cause of their research confusion, they may have been unaware that COVID-19 had altered their biological/social rhythms. Research on the effect of DYMERS on burnout remains in its infancy [68].

## Team Mindfulness

Encouraging team mindfulness to reduce burnout is an effective means among health researchers. A construct developed in 2017 [15,69], it represents “a shared belief among team members that their interactions are defined by a non-judgmental awareness and an attention in processing within-team experiences” [70]. The finding is that it enhances work-related personal fulfilment [71]. Team mindfulness is evident with collective, regular, non-judgmental acknowledgement of each team member’s experiences, tasks, objectives, roles, and structures. It reduces burnout in groups [72] by promoting trust among team members, which has positive effects on employee well-being and performance [73,74] especially during COVID-19 [75,76] when studies on trait mindfulness, as something that can be learned [77], were conducted regarding COVID-19 [75,77,78]. Team mindfulness, like trait mindfulness, can help team members respond with conscious awareness to pandemic challenges and accept the restrictive situation to a greater degree, unlike maladaptive coping strategies such as blaming [78]. Apart from studies by this author [15,17,69], there is a paucity of research on team mindfulness in reducing burnout among health researchers. There is no research regarding how team mindfulness might help alleviate confusion regarding researcher burnout.

## DISCUSSION

The phenomenon of researcher confusion has received little investigation. The last work to consider this problem was published in 2019 [54]. The evidence presented by these authors is that confusion is the starting point of all research. The need to assess researcher confusion is especially relevant, as a recent study found that confusion can continue and be evident in the final publication of a researcher if it is not alleviated [55]. Researchers might experience confusion unrelated to COVID-19 due to internal research challenges [44], identity conflicts [45], or epistemic uncertainty [46].

## CONCLUSION

Confusion is associated with burnout, and burnout increased during the COVID-19 pandemic. Yet, no investigation into whether researcher confusion was affected by the COVID-19 pandemic previously was available. Identified, through historical narrative analysis of one intervention available throughout the COVID-19 pandemic, was that although confusion was the most often reported psychological symptom of burnout in researchers, COVID-19 did not influence this burnout. This study is the first on the pandemic about researcher burnout confusion. It lays the groundwork for further historical research on this topic. This study points to the need to investigate research confusion in researchers from various psychological theories, DYMERS, and team mindfulness. These results suggest that, concerning the effect of the COVID-19 pandemic alone, modifications are unnecessary to the author’s burnout reduction program to improve researcher well-being regarding the psychosomatic symptom of confusion. However, research confusion among researchers is significantly problematic. Investigating the matter regarding various psychological theories, biological/social

dysregulation (DYMERS), and team mindfulness may be productive. This study is the first to consider the effect of COVID-19 on confusion. It contributes to improving the current paucity of literature on the subject.

## SUPPLEMENTARY MATERIALS

The following supporting information can be downloaded at: <https://doi.org/10.5281/zenodo.17566585>, Supplementary S1: 30 September 2025 searches of Google scholar of (1) “burnout in researchers” and (2) “researcher burnout”.

## FUNDING

This research received no external funding.

## INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable as this is a historical study of an intervention that was not a research study.

## INFORMED CONSENT STATEMENT

All participants in the HeNReG or the HeNReP provided their agreement in writing to the following statement, “By joining, participants agree their responses may be anonymously referenced in presentations given and/or scholarly articles written by the facilitator regarding the results of the HeNReG(P)”.

## DATA AVAILABILITY STATEMENT

Anonymous data are available for inspection.

## CONFLICTS OF INTEREST

The author declares no conflicts of interest.

## REFERENCES

1. Freudenberger HJ. Staff burn-out. *Journal of social issues*. 1974 Jan;30(1):159-65.
2. World Health Organization. Burn-out an “occupational phenomenon”: *International Classification of Diseases*. May 28, 2019
3. Canu IG, Marca SC, Dell’Oro F, Balázs Á, Bergamaschi, et.al. Harmonized definition of occupational burnout: A systematic review, semantic analysis, and Delphi consensus in 29 countries. *Scandinavian journal of work, environment & health*. 2021 Mar 1;47(2):95.
4. Jacob J, Jayalakshmi G. Burnout in Healthcare Professionals on Understanding the Role of Job Stress. In *Multidisciplinary Approaches to AI, Data, and Innovation for a Smarter World 2025* (pp. 365-380). IGI Global Scientific Publishing.
5. Ensour W, Al Maaitah H. Investigating Sustainable Employee Well-Being: A Decade of Research on Burnout Studies. *Corporate Governance and Organizational Behavior Review*. 2024;8(3): 29-39.
6. Kools FR, Fox CM, Prakken BJ, van Rijen HV. One size does not fit all: an exploratory interview study on how translational researchers navigate the current academic reward system. *Frontiers in medicine*. 2023 May 5;10:1109297.
7. Ghezzi C. What is research and why we do it. In *Being a Researcher: An Informatics Perspective 2020* Jun 23 (pp. 1-23). Cham: Springer International Publishing.

8. Frascati M. Guidelines for collecting and reporting data on research and experimental development. *The Measurement of Scientific, Technological and Innovation Activities*. 2015.
9. Buckley R. Originality in research publication: Measure, concept, or skill?. *Journal of Travel Research*. 2023 May;62(5):1159-63.
10. Rodriguez Sanchez I, Mantecón A, Williams AM, Makkonen T, Kim YR. Originality: the holy grail of tourism research. *Journal of Travel research*. 2022 Jul;61(6):1219-32.
11. Nguyen LT, Tuamsuk K. Factors influencing researchers' scientific integrity in scholarly publishing: A path analysis approach. *Research Ethics*. 2025 Jul;21(3):384-407.
12. Bonn NA, Pinxten W. Rethinking success, integrity, and culture in research (part 2)—a multi-actor qualitative study on problems of science. *Research Integrity and Peer Review*. 2021 Jan 14;6:3.
13. Hiebert J, Cai J, Hwang S, Morris AK, Hohensee C. Significance of a study: Revisiting the "so what" question. In *Doing Research: A New Researcher's Guide 2022 Dec 3* (pp. 105-124). Cham: Springer International Publishing.
14. Nash C. COVID-19 Limitations on Doodling as a Measure of Burnout. *European Journal of Investigation in Health, Psychology and Education*. 2021 Dec 16;11(4):1688-705.
15. Nash C. Team mindfulness in online academic meetings to reduce burnout. *Challenges*. 2023 Mar 2;14(1):15.
16. Nash C. Doodling as a measure of burnout in healthcare researchers. *Culture, Medicine, and Psychiatry*. 2021 Dec;45(4):565-98.
17. Nash C. Increasing Evidence of Impaired Team Mindfulness in Online Academic Meetings Intended to Reduce Burnout.
18. Stuart C, Neuman K, Truant R. The impact of the COVID-19 pandemic on perceived publication pressure among academic researchers in Canada. *PloS one*. 2022 Jun 22;17(6):e0269743.
19. Boitet LM, Meese KA, Colón-López A, Schwiebert LM, Rogers DA. An investigation of organizational correlates of distress in non-clinician biomedical researchers in the United States. *Journal of Multidisciplinary Healthcare*. 2023 Dec 31:333-43.
20. Marrinhas D, Santos V, Salvado C, Pedrosa D, Pereira A. Burnout and technostress during the COVID-19 pandemic: The perception of higher education teachers and researchers. In *Frontiers in Education 2023 Jul 13* (Vol. 8, p. 1144220). Frontiers Media SA.
21. Boone A, Vander Elst T, Vandebroek S, Godderis L. Burnout profiles among young researchers: a latent profile analysis. *Frontiers in Psychology*. 2022 May 27;13:839728.
22. Sood M, Chawla N, Shukla T, Patel R, Bhogal J, et.al. Challenges in Conducting Mental Health Research during the Coronavirus Disease 2019 Pandemic and Approaches to Handle Them. *World Social Psychiatry*. 2021 Sep 1;3(3):215-20.
23. Hogg HD, Low L, Self JE, Rahi JS. Impact of the COVID-19 pandemic on the research activities of UK ophthalmologists. *Eye*. 2023 Jul;37(10):2089-94.
24. Okeke-Uzodike OE, Gamede V. The Dilemma of Unrelenting Workload Amidst Covid-19 Pandemic: An Agenda for University Female Academics. *Journal of Research in Higher Education*. 2021 Jan 1;5(1).
25. Rasin JH. Confusion. *Nursing Clinics of North America* [Internet]. 1990 ;25(4):909-18.
26. Dhale P. Psychosomatic Disorder. *IJRASET* [Internet]. 2024 7]; 12(4):264-7.
27. Voloshyna V, Popeliushko R, Romanovska L, Kravchyna T, Oliynyk K, et.al. The Influence of Emotional Burnout on the Occurrence of Psychologist's Psychosomatic Diseases in the Conditions of War. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*. 2025 Feb 4;16(1):366-85.
28. Tatayeva R, Ossadchaya E, Sarculova S, Sembayeva Z, Koigeldinova S. Psychosomatic aspects of the development of comorbid pathology: A review. *Medical journal of the Islamic Republic of Iran*. 2022 Dec 12;36:152.
29. Nash C. Physician Burnout: Historical Context, Psychosomatic Division, Evolution, Results, Solutions, and Recommendations. *Encyclopedia*. 2025 May 28;5(2):74.
30. Moradi Y, Mollazadeh F, Karimi P, Hosseingholipour K, Baghaei R. Psychological disturbances of survivors throughout COVID-19 crisis: a qualitative study. *BMC psychiatry*. 2020 Dec 17;20(1):594.
31. Keffane S, Bouazza S. Emotional exhaustion and psychosomatic symptoms for doctors working in hospitals resulting Coronavirus pandemic outbreak. *Advances in Educational Technology and Psychology*. 2021;5(5):58-66.
32. Daumiller M, Rinas R, Breithecker J. Elite athletes' achievement goals, burnout levels, psychosomatic stress symptoms, and coping strategies. *International Journal of Sport and Exercise Psychology*. 2022 Mar 4;20(2):416-35.
33. Voloshyna V, Popeliushko R, Romanovska L, Kravchyna T, Oliynyk K, et.al. The Influence of Emotional Burnout on the Occurrence of Psychologist's Psychosomatic Diseases in the Conditions of War. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*. 2025 Feb 4;16(1):366-85.
34. Llorca-Pellicer M, Gil-LaOrden P, Prado-Gascó VJ, Gil-Monte PR. The role of psychosocial risks in burnout, psychosomatic disorders, and job satisfaction: lineal models vs a QCA approach in non-university teachers. *Psychology & health*. 2025 Apr 3;40(4):681-95.
35. Łopatkiewicz A, Kwaśnicka A, Nowicki P, Furmańczyk K, Zieliński W, et al. Occupational burnout and mental health. A study of psychiatric nurses from six European countries. *Advances in Cognitive Psychology*. 2023;19(1):80.
36. World Health Organization. *Timeline: WHO's COVID-19 Response*. WHO: Geneva, Switzerland. 2022.
37. World Health Organization. *Statement on the Fifteenth Meeting of the IHR (2005) Emergency Committee on the COVID-19 Pandemic*. World Health Organization: Geneva, Switzerland. 2023.
38. Nash C. Report on digital literacy in academic meetings during the 2020 COVID-19 lockdown. *Challenges*. 2020 Sep 7;11(2):20.
39. Nash C. Online meeting challenges in a research group resulting from COVID-19 limitations. *Challenges*. 2021 Nov 12;12(2):29.
40. Nash C. Enhancing hopeful resilience regarding depression and anxiety with a narrative method of ordering memory effective in researchers experiencing burnout. *Challenges*. 2022 Jun 30;13(2):28.
41. Nash C. Challenges identifying and stimulating self-directed learning in publicly funded programs. *The Digital Era of Education: Novel Teaching Strategies and Learning Approaches Designed for Modern Students*. 2020:259-300.
42. Nash C. Historical study of an online hospital-affiliated burnout intervention process for researchers. *Journal of Hospital Management and Health Policy*. 2025 Mar 30;9.
43. Nash C. Psychosocial Outcomes from Self-Directed Learning and Team Mindfulness in Public Education Settings to Reduce Burnout. *Societies*. 2025 Jun 27;15(7):181.
44. TUMIRAN MA. Research methodology confusion among novice Social Sciences and Humanities researchers. *Quantum Journal of Social Sciences and Humanities*. 2024 Feb 26;5(1):115-25.
45. Yang S, Shu D, Yin H. "Teaching, my passion; publishing, my pain": Unpacking academics' professional identity tensions through the lens of emotional resilience. *Higher Education*. 2022 Aug;84(2):235-54.
46. Chen YC. Epistemic uncertainty and the support of productive struggle during scientific modeling for knowledge co-development. *Journal of Research in Science Teaching*. 2022 Mar;59(3):383-422.
47. Dowd JE, Araujo I, Mazur E. Making sense of confusion: Relating performance, confidence, and self-efficacy to expressions of confusion

- in an introductory physics class. *Physical Review Special Topics-Physics Education Research*. 2015 Jun 1;11(1):010107.
48. Reifman JB, Sims M, Penarroyo M, Torres L, White M. Investigating Student Confusion and Self-Efficacy with SLOs to Support Student Learning. *Learning Assistance Review*. 2023;28(1):50-74.
  49. Matos MD, Iaochite RT, Sharp JG. Lecturer self-efficacy beliefs: An integrative review and synthesis of relevant literature. *Journal of Further and Higher Education*. 2022 Feb 7;46(2):225-45.
  50. Mason S, Merga M. Communicating research in academia and beyond: Sources of self-efficacy for early career researchers. *Higher Education Research & Development*. 2022 Sep 19;41(6):2006-19.
  51. Nash C. Scoping Review of Peer-Reviewed Research Regarding Oncologist COVID-19 Redeployment to Emergency Care: The Emergency, Burnout, Patient Outcome, and Coping. *COVID*. 2025 Apr 22;5(5):61.
  52. Nash C. Burnout in Medical Specialists Redeployed to Emergency Care during the COVID-19 Pandemic. *Emergency Care and Medicine*. 2024 Jun 13;1(2):176-92.
  53. Lazarus RS. Coping theory and research: past, present, and future. *Biopsychosocial Science and Medicine*. 1993 May 1;55(3):234-47.
  54. Lazarus RS. Fifty years of the research and theory of RS Lazarus: An analysis of historical and perennial issues. Psychology Press; 2013 Jun 17.
  55. Lazarus RS. The psychology of stress and coping. Issues in mental health nursing. 1985 Jan 1;7(1-4):399-418.
  56. Smallwood N, Karimi L, Pascoe A, Bismark M, Putland M, et al. Coping strategies adopted by Australian frontline health workers to address psychological distress during the COVID-19 pandemic. *General Hospital Psychiatry*. 2021 Sep 1;72:124-30.
  57. Al Eid NA, Arnout BA, Al-Qahtani TA, Farhan ND, Al Madawi AM. Psychological flow and mental immunity as predictors of job performance for mental health care practitioners during COVID-19. *PLoS one*. 2024 Nov 1;19(11):e0311909.
  58. Choe NS, Yelle M. Building Nurse Resilience Through Art Therapy and Narrative Medicine Integration. *Art Therapy*. 2025 Feb 1:1-1.
  59. Lang JJ, Yang LF, Cheng C, Cheng XY, Chen FY. Are algorithmically controlled gig workers deeply burned out? An empirical study on employee work engagement. *BMC psychology*. 2023 Oct 24;11(1):354.
  60. George ES, Antony JM, Wesley MS. Positive Coping and Well-Being of Corporate Professionals during the COVID-19 Pandemic: A Single Case Study. *J. Posit. Sch. Psychol*. 2022;6:5189-94.
  61. Perold I, Knott B, Young C. The COVID-19 pandemic's effect on family leisure activities of working parents with pre-school aged children. *World Leisure Journal*. 2024 Apr 2;66(2):267-90.
  62. Nash C. A Scoping Review of Burnout Avoidance by Employees During the COVID-19 Pandemic: The Role of Psychological Flow. *Encyclopedia*. 2025 Apr 28;5(2):56.
  63. Alkhouri KI. Spiritual confusion in the era of artificial intelligence: a psychology of religion perspective. *International Review of Psychiatry*. 2025 Jul 4;37(5):540-53.
  64. Vieten C, Lukoff D. Spiritual and religious competencies in psychology. *American Psychologist*. 2022 Jan;77(1):26.
  65. Carta MG, Fornaro M, Primavera D, Nardi AE, Karam E. Dysregulation of mood, energy, and social rhythms syndrome (DYMERS): A working hypothesis. *Journal of Public Health Research*. 2024 Apr;13(2):22799036241248022.
  66. Cappadona R, De Giorgi A, Boari B, Tiseo R, Lopez-Soto PJ, et al. Nurses, sleep disturbances, desynchronization of circadian rhythms, and performance: a dangerous liaison? A narrative mini-review. *European review for medical and pharmacological sciences*. 2021;25(22):6924-33.
  67. Merikanto I, Dauvilliers Y, Chung F, Holzinger B, De Gennaro L, et al. Disturbances in sleep, circadian rhythms and daytime functioning in relation to coronavirus infection and long-COVID-A multinational ICOSS study. *Journal of Sleep Research*. 2022 Aug;31(4):e13542.
  68. Nash C. An Initial Scoping Review of Dysregulation of Mood, Energy, and Social Rhythms Syndrome (DYMERS) Regarding Burnout in Healthcare Professionals During COVID-19. *Journal of Clinical Medicine*. 2025 Feb 6;14(3):1035.
  69. Nash C. Team Mindfulness for Healthcare Burnout Reduction. *Journal of Mental Health Disorders*. 2023 Oct 8;3(1):16-7.
  70. Yu L, Zellmer-Bruhn M. Introducing team mindfulness and considering its safeguard role against conflict transformation and social undermining. *Academy of Management Journal*. 2018 Feb;61(1):324-47.
  71. Liu S, Xin H, Shen L, He J, Liu J. The influence of individual and team mindfulness on work engagement. *Frontiers in psychology*. 2020 Jan 21;10:2928.
  72. Klatt M, Westrick A, Bawa R, Gabram O, Blake A, et al. Sustained resiliency building and burnout reduction for healthcare professionals via organizational sponsored mindfulness programming. *Explore*. 2022 Mar 1;18(2):179-86.
  73. Jaskevičiūtė V, Stankevičiūtė A, Diskienė D, Savickė J. The relationship between employee well-being and organizational trust in the context of sustainable human resource management. *Problems and perspectives in management*. 2021 May 21;19(2):118-31.
  74. Jaškevičiūtė V. Trust in organization effect on the relationship between HRM practices and employee well-being. In: *SHS web of conferences 2021* (Vol. 120, p. 02021). EDP Sciences.
  75. Suthatorn P, Charoensukmongkol P. Effects of trust in organizations and trait mindfulness on optimism and perceived stress of flight attendants during the COVID-19 pandemic. *Personnel Review*. 2023 May 2;52(3):882-99.
  76. Pradhan RK, Panda M, Hati L, Jandu K, Mallick M. Impact of COVID-19 stress on employee performance and well-being: role of trust in management and psychological capital. *Journal of Asia Business Studies*. 2024 Jan 18;18(1):85-102.
  77. Dillard AJ, Meier BP. Trait mindfulness is negatively associated with distress related to COVID-19. *Personality and individual differences*. 2021 Sep 1;179:110955.
  78. Schmiedeler S, Reichhardt A, Schneider L, Niklas F. Trait mindfulness, self-efficacy, and coping strategies during COVID-19. *Anxiety, Stress, & Coping*. 2023 Nov 2;36(6):674-89.