Ohio Journal of Public Health, Vol. 6, Issue 2 ISSN: 2578-6180

RESEARCH ARTICLE

"When COVID Hit": Psychosocial Impacts and Coping Strategies Among Ohio's Public Health Workforce

Kerri Lynn Knippen[1]; Jeanelle S. Sears[2]; Lauren Maziarz[1]; Michelle Bussard[3]; Lara Wilken[3]

[1]Department of Public and Allied Health, Bowling Green State University, Bowling Green, OH
[2]Department of Human Services, Bowling Green State University, Bowling Green, OH
[3]School of Nursing, Bowling Green State University, Bowling Green, OH

Corresponding Author: Kerri Lynn Knippen, 122 Health and Human Services, Bowling Green, OH 45403, kknippe@bgsu.edu
Submitted June 19, 2024 Accepted August 15, 2024 Published October 10, 2024 https://doi.org/10.18061/ojph.v6i2.9955

ABSTRACT

Background: The COVID-19 pandemic was associated with widespread occupational stress and burnout. Given the duties of public health, alongside the politicization of public health mandates in Ohio, we attempted to understand the potentially unique psychosocial impact of the pandemic on Ohio's public health workforce.

Methods: A mixed method study was conducted to understand the factors associated with everyday discrimination, burnout, perceived stress-anxiety, and commitment to continue in public health. Ohio public health workers were invited to participate in an anonymous online survey and/or confidential phone interview. Descriptive statistics, bivariate tests, and stepwise linear regression were calculated. Interpretive phenomenological analysis was used to evaluate the qualitative interview data.

Results: The majority reported symptoms of burnout, and nearly 1 in 3 indicated readiness to leave the public health workforce. Public facing response duties correlated with everyday discrimination, burnout, and commitment to continue. Everyday discrimination was associated with perceived stress-anxiety. Perceived stress-anxiety was linked to burnout. Job satisfaction correlated with both burnout and commitment to continue. Two qualitative themes focused on psychosocial impact and coping were organized into 7 subthemes which elaborated our understanding and affirmed the quantitative findings.

Conclusion: The findings represent a critical time of the COVID-19 pandemic and potential fallout on Ohio's public health workforce. Work is needed to develop and maintain a resilient workforce. To prevent burnout and loss of institutional knowledge, effective coping and capacity building efforts are needed to tackle the unpredictable conditions of public health. Initiatives to address the public's understanding and normative response to public health efforts are warranted.

Keywords: COVID-19; Public health workforce; Ohio; Mixed methods

INTRODUCTION

The COVID-19 pandemic placed health care workers and first responders at risk for traumatic stress, depression, generalized anxiety, insomnia, occupational stress and dysfunction, moral distress, and a general disinterest in work.[1-5] COVID-19-related occupational stressors (CROS) contributing to this decline included grief and loss, witnessing a patient decline in health, a lack of personal protective equipment, feelings of helplessness, and fears of contracting the virus.[2] In response, health care workers utilized a variety of coping mechanisms such as practicing personal protective measures, relying on friends and family for emotional support,

meditation, religious/spiritual activities, as well as exercise to relieve workplace stress to deal with COVID-19 stressors.[6]

Given these concerns, it is important to specifically investigate the potentially unique impacts on the public health workforce and its coping mechanisms. This workforce not only provided recommendations and interventions, but also enforced COVID-19 policies and mandates, positioning them for distinct CROS like work-based threats or harassment[1] as well as concerning rates of negative occupational outcomes such as burnout and resignation, even compared to other health care workers.[7,8] Rizzo, for example, found 57% of public health officials left their position due to COVID-19 related events,[9] a finding consistent with Leider et al, who found nearly half of all public health employees surveyed left their positions between 2017 and 2021.[10]

A previous publication indicated public health workers experience occupational stigma and stress in the eye of the public due to the politicization of COVID-19 and the public health response.[11] As an expansion on the original article, this paper elaborates on the psychosocial impacts and coping strategies employed by public health workers in the state of Ohio. Ohio provides a rich and nuanced context for this examination, while also retaining transferability, particularly across other states in the United States. As elsewhere, Ohio public health mandates were highly politicized with substantial impacts on the public health workforce.

For example, tumultuous backlash including the spread of anti-Semitic messages during an angry protest outside her home landed on The Ohio Department of Health's (ODH) director Amy Acton. Acton's subsequent resignation was an impactful loss for Ohio's public health workforce and a critical moment for public health's reputation and future in the state. Governor Mike DeWine's decisions during COVID-19 also received strong criticism, fueling debates about the future status and role of the public health workforce and its evolving relationship with the public. This background provides critical context for understanding the impacts of the COVID-19 pandemic on Ohio public health workers' psychosocial well-being (everyday discrimination, burnout, perceived stress-anxiety), commitment to continue in public health, and strategies for managing stress and staying, if at all, in their positions.

METHODS

Mixed methods were used to evaluate the impact of the COVID-19 pandemic on Ohio public health workers. This paper expands on the qualitative findings previously reported on the experiences of Ohio public health workers.[11] This study's protocol was approved by the institutional review board of Bowling Green State University.

Participants

A non-probability sampling method with a snowballing recruitment strategy was used to recruit Ohio public health workers over the age of 18 years. Direct email invitation was sent to 472 public health workers in Ohio. Emails were publicly available via Ohio health department websites. Direct invitation was also sent to Ohio public health workers who attended continuing education events with Bowling Green State University. The Association of Ohio Health Commissioners and the Ohio Society of Public Health Educators also sent the electronic invitation to their respective members. Recipients were asked to forward the invitation to other Ohio public health workers.

Procedures

From the invitation, participants could choose to participate in an online survey and/or a qualitative phone interview. An electronic consent process was used and no personal information was collected during the consent. Those agreeing to the survey were routed to an anonymous electronic questionnaire. Participants who consented to only the interview were directed to a separate confidential sign-up using Cognito Forms (Cognito LLC, Columbia, SC). Interview participants were encouraged to use a personal email instead of their work email, as well as a pseudonym in the sign-up and interview process. If a participant agreed to both study activities, they were initially directed to the anonymous questionnaire and then redirected to the confidential sign-up.

Quantitative Data Collection and Measures

The anonymous electronic questionnaire was administered via Qualtrics XM survey software (Qualtrics, Provo, UT). Most items were closed ended with Likert scale response options; however, an opportunity for qualitative response was provided. The questionnaire collected data on independent and dependent variables; the measures are described below. Potential confounders such as demographic information, work history, COVID-19 work roles, health department size, and geographic location were also examined.

Dependent Variables

Everyday discrimination

The online questionnaire assessed frequency of experiencing everyday discrimination[12] because of their job during COVID-19 (ie, "You are treated with less courtesy because of your job," "You receive poorer service at local businesses (stores, restaurants, etc) because of your job," "Your family has been threatened or harassed because of your job"). A 5-point Likert scale was used for 13 items of everyday discrimination ranging from "never" through "very often."

Burnout

A single item burnout measure[13] was used to screen what proportion of the sample reported job related burnout symptoms. Participants were asked to respond to the statement, "Overall, which statement best describes how you feel about your job since COVID-19?" with 5 response options ranging from: "I enjoy my work. I have no symptoms of burnout" to "I feel completely burned out and often wonder if I can go on. I am at the point

where I may need some changes or may need to seek some sort of help." In addition, a 5-item composite scale related to work related burnout was used. Statements were adapted from a teacher burnout measure.[14] Participants were asked to rate their level of disagreement/agreement using a 4-point Likert scale to statements such as "I am weary with all my job responsibilities," "I feel frustrated at work," and "I no longer have an interest in my work."

Perceived stress-anxiety

Participants were asked about the frequency of perceived stress-anxiety (5-point Likert scale, "never" through "very often"). A total of 12 statements were selected from previous instruments[15,16] and used for this section (ie, "In the last month how often have you… been upset because of something that happened unexpectedly?" or "…felt that you were unable to control the important things in your life").

Commitment to continue in public health

A single item was used. Participants were asked to select 1 of 5 statements that described their commitment (ie, "I would like to stop working in public health," "I would stop if I could find any job in which I could earn at least as much money as I am earning now," or "I would not stop working in public health").

Independent Variables

Stigma

A composite scale was used to examine frequency of associative stigma[17,18] as a public health worker during COVID-19 (5-point Likert scale, "never" through "very often"). Sample statements included "People express the belief that public health workers are to blame for COVID-19 related challenges (ie, job loss, closure of business, restrictions)," "The media portrays public health workers as not being credible or trustworthy," "People stay away from me because they are afraid they might get COVID-19 from me," or "I have lost friends because of my job."

Mindfulness

A composite scale was used to assess frequency of engaging in mindfulness[19] related behaviors in the past 7 days (5-point Likert scale, ranging from "never or 0 days" through "very often or 6-7 days in the past week"). A total of 18 statements were used to assess frequency of behaviors such as relaxation activities, healthy eating, physical activity, meditation, time management, and positive self-talk.

Social support

We assessed social support from family, friends, and coworkers by asking participants to rate their level of disagreement/agreement to 10 statements adapted from previous instruments.[20,21] Sample statements included "I get the emotional help and support that I need from my family and friends," "My coworkers are understanding if I have a bad day," or "My local board of health supports the work we do."

Job satisfaction

Participants were asked to rate their job satisfaction before and during COVID-19 using a 5-point Likert scale ("I hate it" through "I love it"). Satisfaction was also ascertained by asking participants to compare their job satisfaction with other public health workers ("No one dislikes this job more than I do" through "No one likes being a public health worker better than me"). A third item asked if they would recommend being a public health worker to a friend or family member.

Cynicism

Participants were asked to evaluate their disagreement/agreement with 4 statements related to cynicism. Examples included "Many laws and/or standards of operating practice that we are supposed to enforce are not clear" or "The public seems to have more defiant attitudes than ever before."

Resilience

Six statements to assess resilience[22] were included in the survey and participants could select their disagreement/agreement using a 4-point Likert scale. Examples included "I tend to bounce back quickly after hard times," "It is hard for me to snap back when something bad happens," or "I tend to take a long time to get over setbacks in my life."

Quantitative Data Analysis

Survey data were evaluated using IBM Statistical Package for the Social Sciences (SPSS) for Macintosh, Version 28.0 (IBM Corp., Armonk, NY). Negatively worded measures were reverse coded. Composite scores and internal reliability were calculated for each scale. Cronbach alpha results ranged from .57 to .89 (job satisfaction $\alpha = .74$, everyday discrimination $\alpha = .85$, stigma $\alpha = .77$, work related burnout $\alpha = .89$, perceived stress-anxiety $\alpha = .88$, mindfulness $\alpha = .87$, social support $\alpha = .84$, resilience $\alpha = .91$, cynicism $\alpha = .57$). All composite scales, except cynicism, had acceptable internal reliability and were retained for further analysis.

Descriptive statistics were calculated to determine participant characteristics. A paired sample t test was calculated to evaluate the self-reported change in job satisfaction, from before to during COVID-19, and hours worked per week. Pearson correlation was calculated to examine the bivariate relationships among the composite variables. Stepwise linear regression was used to evaluate correlates of the dependent variables including everyday discrimination, perceived stress-anxiety, work related burnout, and commitment to continue in public health. Confounder variables were included in the stepwise linear regression and significant variables were retained in the final model. Collinearity statistics were evaluated for regression analyses.

Qualitative Data Collection and Analysis

Qualitative interviews complemented survey data by elaborating our understanding of participant experiences. We utilized

interpretive phenomenological analysis (IPA) which is appropriate for mixed methods inquiry.[23] Semistructured phone interviews were recorded and transcribed using the mobile application, TapeACall (TelTech Systems Inc., 2020). Initial noting and emergent themes analysis were conducted to create and apply a coding system using Lumivero's qualitative software, NVivo 12, released 2017. Additional details are described in a previous publication.[11] We enhanced trustworthiness through memo writing, a detailed paper trail, ongoing peer consultation, and member checking.

RESULTS

Quantitative Data

Survey responses were collected from public health workers in Ohio (n = 53). Most identified as female (75.5%), White (92.5%), non-Hispanic (98.1%), and having a 4-year degree (54.7%) (Table 1). Respondents reported a variety of roles/job titles, with registered sanitarian most often reported. Health departments/districts primarily served rural communities. Time working in public health ranged from less than 1 year to 38 years (mean (M) = 11.30, standard deviation (SD) = 11.42) and time in current position ranged from less than 1 year to 23 years (M = 4.92, SD = 5.36). Half had a supervisory role, and remote work was reported by 51% of the sample.

Based on the single item burnout screener, 73.6% of the respondents indicated some level of burnout (Table 2). We also observed an increase in reported hours during the pandemic; employees reported an increase in the average work hours per week from pre-COVID-19 (M = 36.69, SD = 11.36) to during COVID-19 M = 47.29, SD = 14.72), which was a significant increase (t = 6.34, p < .001). A shift in self-reported job satisfaction was observed, as

Table 1. Sample Characteristics of Ohio Public Health Workers Completing Survey Describing Public Health Worker Experiences During COVID-19 (n = 53)

Characteristic		n	%[a]
Sex			
	Male	12	22.6
	Female	40	75.5
	Other	1	1.9
Ethnicity			
	Non-Hispanic	51	98.1
	Hispanic or Latino or Spanish Origin	1	1.9
Race			
	Asian	1	1.9
	Black or African American	1	1.9
	White	49	92.5
	Other/Did not disclose	2	3.8
Education			
	High school diploma	1	1.9
	Associate degree	2	3.8
	4-year degree	29	54.7
	Master's degree	19	35.8
	Doctoral degree	2	3.8
Primary job title/position			
	Registered nurse/public health nurse/licensed practical nurse	5	9.4
	Registered sanitarian	13	24.5
	Director of environmental services	4	7.5
	Director of nursing	1	1.9
	Health educator	9	17
	Administrative assistant	2	3.8
	Epidemiologist	2	3,8
	Health commissioner	8	15.1
	Community response planner	1	1.9
	Public information officer	4	7.5
	Other	4	7.5
COVID-19 responsibilities			
	Contact tracing	40	75.5
	Enforcement	24	45.3
	Direct clinical care	10	18.9
	Communication with public on COVID-19	37	69.8
	Educating public on COVID-19	35	66
	Educating local businesses/organizations on COVID-19 guidelines	32	60.4
	Other (ie, vaccination, outbreak investigation, data management, etc)	19	35.8
Primary community(ies) served			
	Rural	33	62.3
	Suburban	13	24.5
	Urban	7	13.2
Size of department/district			
	< 20 employees	7	13.2
	21-30 employees	16	30.2
	31-49 employees	7	13.2
	50-74	0	0
	75+ employees	23	43.4

[a] % based on valid percentage

28.3% reported disliking or hating their work during the pandemic. There was a significant decrease in job satisfaction from before (M = 4.61, SD = .60) to during COVID-19 (M = 3.10, SD = 1.06) (t = 10.92, p < .001). Regarding commitment to continue in public health, 30.2% indicated an interest to stop working in public health all together.

Bivariate correlation tests are summarized in Table 3. Everyday discrimination was associated with a higher level of stigma and a lower commitment to continue in public health. Work related burnout correlated with a higher level of perceived stress-anxiety, a lower level of job satisfaction, and decreased commitment to continue in public health. Job satisfaction, resilience, and mindfulness were associated with a lower level of perceived stress-anxiety. Social support correlated with higher levels of mindfulness and resilience.

Stepwise linear regression results are summarized in Table 4. Stigma, communication with the public on COVID-19, and educating local businesses on guidelines correlated with a higher level of everyday discrimination. A lower level of resilience correlated with a higher level of perceived stress-anxiety, while everyday discrimination, burnout, and size of health department were associated with a higher level of perceived stress-anxiety. Correlates of burnout included job satisfaction, perceived stress-anxiety, and educating the public on COVID-19. Job satisfaction was correlated with a higher level of commitment, while educating the public on COVID-19 and number of years in current position were correlated with a lower level of commitment to continue.

Qualitative Results

Qualitative data were collected from 11 public health workers in both administrative and educational roles.[11] At the time of interview, participants' length of employment in their current position ranged from 1.5 years to 23 years (M = 6.22 years, SD = 6.33), and ages ranged from 24 years to 61 years (M = 43 years, SD = 10.39). Nearly all identified as White (n = 10, 90.91%) and female (n = 8,

Table 2. Burnout Screening, Self-rated Job Satisfaction Before and During COVID-19, Commitment to Continue in Public Health Workforce

Variable	n	%[a]
Burnout screener		
I enjoy my work. I have no symptoms of burnout.	2	3.8
Occasionally I am under stress, and I don't always have as much energy as I once did, but I don't feel burned out.	12	22.6
I am burning out and have one or more symptoms of burnout, such as physical and emotional exhaustion.	22	41.5
The symptoms of burnout that I'm experiencing won't go away. I think about frustration at work a lot.	9	17.0
I feel completely burned out and often wonder if I can go on. I am at the point where I may need some changes or may need to seek some sort of help.	8	15.1
Job satisfaction before		
It was okay	3	5.9
I liked it	14	27.5
I loved it	34	66.7
Job satisfaction during		
I hate it	3	5.7
I dislike it	12	22.6
It's okay	21	39.6
I like it	10	18.9
I love it	7	13.2
Commitment to continue in public health		
I would like to stop working in public health	2	3.8
I would stop working at once if I could get any other kind of job	2	3.8
I would stop if I could find any job in which I could earn at least as much money as I am earning now	12	22.6
I am not eager to stop, but I would do so if a better job opportunity in public health came along	21	39.6
I would not stop working in public health	16	30.2

[a] % based on valid percentage

Table 3. Bivariate Associations Among Composite Scales Assessed in Survey of Ohio Public Health Workers During COVID-19

Variable	V1	V2	V3	V4	V5	V6	V7	V8	V9
V1 - Everyday discrimination	--								
V2 - Stigma	**.67****	--							
V3 - Work related burnout	0.26	0.19	--						
V4 - Job satisfaction	-0.18	-0.16	**-.79****	--					
V5 - Commitment to continue	**-.29***	-0.22	**-.53****	**.54****	--				
V6 - Perceived stress-anxiety	0.19	0.19	**.61****	**-.45****	-0.13	--			
V7 - Resilience	0.02	0.04	**-.41****	**.36****	0.07	**-.62****	--		
V8 - Social support	0.04	-0.01	**-.29***	0.19	-0.004	-0.22	**.45****	--	
V9 - Mindfulness	-0.12	0.02	-0.13	0.13	-0.05	**-.31***	**.39****	**.39****	--

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

72.7%). The analysis revealed 2 main themes and 7 subthemes which are summarized below and in Table 5.

Theme 1: Psychosocial Impacts

Qualitative analysis revealed workers' experiences of "when COVID hit." They confronted new challenges in their community by bearing the burden of top-down mandates and public backlash. Their role demanded more time and effort, limited the ability to separate the personal and professional, and intensified their emotional labor and the subsequent impacts. Table 5 illustrates the 3 subthemes categorizing these psychosocial impacts.

To begin, public health workers endured professional isolation through physical distancing through remote work, limited in-person contacts, and quarantining. This was exacerbated by a disconnect from state leaders, whom they perceived as devaluing local needs and contexts and failing to provide critical resources and information. Tensions surrounding public health mandates exposed a lack of understanding and empathy among the public. In turn, the role of the public health worker was increasingly stigmatized. This tenuous context only exacerbated the emotional toll on workers which included genuine distress over some of the actions they had to take. Participants found themselves feeling trapped and overwhelmed by the constant bombardment of COVID-19-related discussion in the media and among family and friends. One individual even compared the experience to an abusive relationship, as they were in a constant state of hyperarousal, anxiety, and exhaustion.

Theme 2: Coping Strategies

In response to these psychosocial impacts, we found that workers employed a variety of emotional strategies, behaviors, and thoughts to help with adjusting. Table 5 elaborates on these through 4 subthemes. Firstly, participants revealed distancing as a strategy for managing their identity and the role strain they experienced. Most commonly, participants refrained from engaging on social media. Others became more selective about when and where they spent time in the community. Yet, this was not often fully possible due to the nature of the work. Politicization of the public health response, for example, strained many workers' personal relationships and necessitated firm boundaries. Relatedly, workers felt the need to "get away" and "let go" through short retreats or just a day off. Participants also took "mental unwind time" through hobbies, creative activities, exercise, and time outdoors. However, several noted the ongoing challenge of maintaining their desired routines and strategies given work demands. Several participants admitted getting away through an increase in alcohol consumption. One worker noted the importance of seeking therapy, while another indicated reservations about admitting they needed support. A supervisor from another location relayed that opportunities to take a mental health break from work were underused by workers.

A third major coping strategy was connecting through activities like "venting" with friends. Interviewees described the importance of coworkers in supporting one another. Another unintended benefit of the pandemic response and social distancing seemed to be that it "allowed us to truly focus on family" and "improve relationships." In this sense, distancing from everything else made room for more personal connection and opportunities to reevaluate priorities. Spiritual connection was also mentioned as important for emotional support and guidance, as a way to distance from worldly concerns and responsibility. With that, there were moments of intense questioning requiring mindfulness in the

Table 4. Stepwise Linear Regression Results[a]—Correlates of Psychosocial Outcomes Including Everyday Discrimination,[b] Perceived Stress-Anxiety,[c] Burnout,[d] Commitment to Continue in Public Health[e]

Correlates	Beta	t	p	95% CI[f] Lower	95% CI Upper	VIF
Stigma	.56	5.65	<.001	.44	.94	1.07
Communication with the public on COVID-19	.31	2.92	.006	1.59	8.73	1.25
Educating local businesses on COVID-19 guidelines	.23	2.19	.034	.27	6.69	1.17
Dependent Variable - Perceived Stress-Anxiety Correlates						
Resilience	-.46	-4.35	<.001	-1.04	-.38	1.17
Everyday discrimination	.27	2.46	.018	.05	.54	1.29
Burnout	.32	2.64	.012	.17	1.29	1.52
Size of health department	.26	2.57	.014	.29	2.45	1.09
Dependent Variable - Work Related Burnout Correlates						
Job satisfaction	-.65	-7.40	<.001	-1.43	-.82	1.16
Perceived stress-anxiety	.28	3.14	.003	.04	.20	1.17
Educating public on COVID-19	.19	2.39	.021	.23	2.72	1.01
Dependent Variable - Commitment to Continue in Public Health Correlates						
Job satisfaction	.50	4.38	<.001	.13	.35	1.00
Educating public on COVID-19	-.29	-2.56	.014	-1.13	-.13	1.04
Years in current position	-.24	-2.03	.049	-.096	.00	1.04

[a] Collinearity tolerance and variance inflation rate (VIF) were acceptable for all final models.
[b] Everyday discrimination [higher score indicates higher level of everyday discrimination], $R^2 = .61$, $F = 21.98$, $P < .001$.
[c] Perceived stress-anxiety [higher score represents higher level of perceived stress-anxiety], $R^2 = .60$, $F = 15.47$, $P < .001$.
[d] Work related burnout [higher score represents higher level of work related burnout], $R^2 = .71$, $F = 34.87$, $P < .001$.
[e] Commitment to continue in public health [higher score represents higher commitment to staying in public health], $R^2 = .45$, $F = 11.49$, $P < .001$.
[f] CI = confidence interval.

Table 5. Qualitative Themes, Subthemes, and Exemplar Quotes from Phone Interviews with Ohio Public Health Workers During COVID-19

Theme 1: Psychosocial Impact	
Subtheme	**Exemplar Quotes**
Isolation and stigmatization	I feel I'm not getting proper training…. I haven't even met half of my coworkers... I don't want a relationship, but rapport. (female sanitarian) We are from your community…Whatever side of the mask debate you fall on, whatever political affiliation you have …. We're all doing our best with the resources and information we have...Just be nice. (female sanitarian and health inspector)
Emotional toll	I'm a community member...people know who I am... I use [these] services, and to go and tell them and say they couldn't be open, it was just awful just to see the hate and the anger in their eyes. And it wasn't the hate towards me, it was just for the situation. (male sanitarian) I talked to a gentleman being admitted [to the hospital] …[Later] I got a call from his parish because they were called to give the last rites. They wanted to know what the priest had to do to protect himself…Those are very emotional things that people in the public don't know and they don't understand. (female health commissioner)
Feeling trapped	People felt guilty if they were not working all the time…. There's no real defined line anymore between when you're working and when you're not working…There isn't really any way to avoid it at all. You're always there. (male health commissioner) One of the most difficult parts of it is, even if you're away from here, you're not away from COVID. It's in the media. It's everywhere…There isn't an escape. (male health commissioner)
Theme 2: Coping Strategies	
Subtheme	**Exemplar Quotes**
Managing identity and role strain	I read for the church once a month. I still do that...But it's just kind of difficult when you know that there are a lot of people who don't necessarily agree with what you do for a living…It's just kind of hard to separate that. (female health commissioner) I don't know if I will ever go in public again, at least for the coming years, displaying that I am a public health worker...I am constantly thinking, 'Oh my gosh...they're going to know I work for the health department.' I don't know what's going to happen, but I know it's not going to be a positive interaction. (female sanitarian and health inspector)
Getting away, taking space	I do like to work out…I like to do yoga. I did stop doing that...because I'd come home, and I was so tired. I would just collapse in the chair...You're literally working all day and sometimes into the evening. Then you go home and sleep, and then I get back up and it's all over again. (female environmental health director) I probably drink a little bit more…Not a lot, but yeah there's times where I need a beer. And not that I didn't before, but it's a little more than I used to. (female health educator and public information officer)
Connecting	Sometimes people in your personal life...don't understand... But I'm just grateful for the support that I had going through this. I think that was a definite positive and something I try to keep remembering, even on days where it's kind of difficult...Thank goodness for all my public [health] friends. (female environmental health officer) There were times I probably should have prayed more, but by the time you get home you're just kind of drained...But that is something that I try to do all the time...pretty much just reminding myself that it doesn't all fall on me, and we can get through this...just understanding that we're not alone. (female health commissioner)
Mindfulness and meaning making	You have got to let your mind not focus on things. You need a short memory. And I'm lucky, I can do that for the most part. You can feel stressed, but it's just part of life, you know? I post pictures of sunsets and beautiful things I see. I want people to still see the beauty in the world, not the hate. I've always been that way. (male sanitarian) I just had [to] reset, rewind. This is just a little blurb in what my career is going to look like...I really enjoy working for public health...But there were times...I had to look at myself in the mirror and be like, "What are you doing? Why do you want to do this?" But then reality sets in, and you're like "No, this too shall pass. And we will get back to normal, whatever that looks like." (female sanitarian and health inspector)

everyday and making meaning or peace with their professional identity and practice. This included focusing on the good and viewing the pandemic as a piece of history, and a temporary opportunity to learn and adapt.

DISCUSSION

Researchers were interested in determining the experiences and impacts of COVID-19 specifically on public health workers in Ohio. The combination of quantitative and qualitative data better tells the unique story of Ohio public health workers including the various stressors involved, how relationships and mental health were impacted, as well as the coping mechanisms used by workers. Our findings reveal unique perspectives of public health workers and provide a context for the importance of building and maintaining a resilient public health workforce.

The prevalence of burnout was quite high in the survey sample, and nearly 1 in 3 considered leaving public health altogether. The data are concerning, and it has been estimated that by 2025 nearly half of the public health workforce would leave or retire.[10] Although we did not assess if retirement was a factor in one's commitment, we did observe that number of years in position correlated with a lower level of commitment to continue. This could lead to limited institutional knowledge of the public health workforce.[24] Burnout was connected to job satisfaction and

perceived stress-anxiety. Further, we found that COVID-19 response roles that required public interaction were associated with negative psychosocial outcomes and a lower level of commitment to continue. It is conceivable that public facing roles increased the potential for stigma and discrimination which contributed to psychosocial impact.

Regarding psychosocial impacts, our interpretation is that participants experienced isolation and stigmatization, an emotional toll, and feeling trapped. These findings mirror those that report negative mental health impacts on health care workers, particularly those that experienced "long-work hours," "inability to take time off," and "inadequate compensation."[1] Tiesman and colleagues demonstrated that, among public health workers, these negative impacts were worse for those having experienced workplace harassment and violence.[25] Although workers reported these impacts, at least one administrator found employees did not take advantage of onsite mental health support. While this may be surprising, it is consistent with previous research. For example, Rose et al found nurses, physicians, and other health care workers were unlikely to utilize mental health services as a coping tool while concurrently agreeing that availability of mental health services in the workplace would help to decrease work related stress in future health emergencies.[6]

As a result of these and other psychosocial impacts, participant coping strategies included managing identity and role strain, getting away - taking space, connecting, and mindfulness and meaning making. Connecting with others is insightful given the simultaneous feeling of isolation and stigmatization from family, friends, and the public. These effects also heightened feelings of role strain, pressure to manage, and even to conceal their occupational identity. Given these realities, future research on the post-pandemic climate should explore how, if at all, public attitudes have shifted and the subsequent impacts and adjustments among this unique workforce. We observed that resilience was associated with a lower level of perceived stress-anxiety. Although resilience was not a primary outcome, the bivariate evaluation revealed a relationship with mindfulness as well as job satisfaction and commitment. Implications for practice include preparing a resilient workforce equipped with skills to resolve conflict, build relationships, employ stress management and coping strategies such as mindfulness, and prioritize self-care to mitigate burnout. It is conceivable that these efforts could foster job satisfaction, while minimizing psychosocial impact, and thus improve commitment to stay in public health. Ensuring public health agencies have the resources to support the workforce while carrying out essential duties is vital as is increasing efforts to elevate public understanding and receptivity to public health efforts.

Strengths and Limitations

A strength of this study is the focus specifically on public health workers and within the generous context of the state of Ohio. Participants represented various public health positions. Still, limitations include generalizability outside of Ohio, limited diversity in the sample, and the possibility that factors not examined (ie, retirement intention) impacted the outcomes assessed in this study. We did not explore possible correlates (ie, leadership or management style, work-life balance, salary) of job satisfaction which might influence burnout and commitment to continue. Data were collected from October 2020 through March 2021. Timing may have influenced respondent's perceptions and experiences. We collected limited information regarding such factors as political orientation. We supported trustworthiness of the qualitative analysis through peer consultation, collaborative coding, and memo writing as well as formal and informal member checking with each subsequent participant.

PUBLIC HEALTH IMPLICATIONS

Our results suggest providing public health workers with education on effective coping strategies could help mitigate negative psychosocial effects, even as the COVID-19 public health emergency has ended. Public health remains an environment of unpredictability—full of potential for being volatile, uncertain, complex, and ambiguous (VUCA). An additional recent example relative to the Ohio public health workforce is the East Palestine train derailment.[26] Having an agile and resilient workforce is critical for future public health responses. As future pandemics and public health emergencies arise, promoting health and wellness, mindfulness, connectedness with coworkers, and taking time for oneself could ensure public health workers do not burnout and leave the profession. Employers can also implement evidence-based strategies to improve employee well-being such as paid time off for mental well-being[27] and flexible working hours.[28] Finally, more work is needed to understand the public's normative response to public health efforts and the impact on public health workers.

DECLARATIONS

Funding: not applicable. Conflicts of interest/competing interests: none to disclose.

ACKNOWLEDGMENTS

We recognize Vivian Miller, Melissa Burek, Beth Sanders, and Bradley Fevrier for their assistance with the study concept and survey development. We also recognize Lydia McGillvary and Isabelle Kennedy for their assistance with qualitative data analysis.

Author Contribution

All authors contributed to the concept and design of the study. Kerri Lynn Knippen conducted recruitment, quantitative data collection, and analysis. Jeanelle Sears, Lauren Maziarz, Michelle Bussard, and Lara Wilken conducted qualitative interviews and qualitative data analysis. All authors contributed to the initial draft and subsequent revisions of the manuscript. All authors agreed to the final version to be published.

REFERENCES

1. Bryant-Genevier J, Rao CY, Lopes-Cardozo B, et al. Symptoms of depression, anxiety, post-traumatic stress disorder, and suicidal ideation among state, tribal, local, and territorial public health workers during the COVID-19 pandemic - United States, March-April 2021. *MMWR*

Morb Mortal Wkly Rep. 2021;70(48):1680-1685. https://doi.org/10.15585/mmwr.mm7048a6

2. Hendrickson RC, Slevin RA, Hoerster KD, et al. The impact of the COVID-19 pandemic on mental health, occupational functioning, and professional retention among health care workers and first responders. *J Gen Intern Med*. 2022;37(2):397-408. https://doi.org/10.1007/s11606-021-07252-z
3. Hennein R, Lowe S. A hybrid inductive-abductive analysis of health workers' experiences and wellbeing during the COVID-19 pandemic in the United States. *PLoS One*. 2020;15(10):e0240646. https://doi.org/10.1371/journal.pone.0240646
4. Jones AM, Clark JS, Mohammad RA. Burnout and secondary traumatic stress in health-system pharmacists during the COVID-19 pandemic. *Am J Health Syst Pharm*. 2021;78(9):818-824. https://doi.org/10.1093/ajhp/zxab051
5. Sonis J, Pathman DE, Read S, Gaynes BN. A national study of moral distress among US internal medicine physicians during the COVID-19 pandemic. *PLoS One*. 2022;17(5):e0268375. https://doi.org/10.1371/journal.pone.0268375
6. Rose S, Hartnett J, Pillai S. Healthcare worker's emotions, perceived stressors and coping mechanisms during the COVID-19 pandemic. *PLoS One*. 2021;16(7):e0254252. https://doi.org/10.1371/journal.pone.0254252
7. Preti E, Di Mattei V, Perego G, et al. The psychological impact of epidemic and pandemic outbreaks on healthcare workers: rapid review of the evidence. *Curr Psychiatry Rep*. 2020;22(8):43. https://doi.org/10.1007/s11920-020-01166-z
8. Stone KW, Kintziger KW, Jagger MA, Horney JA. Public health workforce burnout in the COVID-19 response in the US. *Int J Environ Res Public Health*. 2021;18(8):4369. https://doi.org/10.3390/ijerph18084369
9. Rizzo S. Local health official report threats, vandalism and harassment during the pandemic, study finds. *Washington Post*. March 17, 2022.
10. Leider JP, Castrucci BC, Robins M, et al. The exodus of state and local public health employees: separations started before and continued throughout COVID-19. *Health Aff (Millwood)*. 2023;42(3):338-348. https://doi.org/10.1377/hlthaff.2022.01251
11. Sears JS, Maziarz L, Wilken L, Bussard M, Knippen K. Public health in the public eye: experiences of Ohio's public health workforce during COVID-19. *Health Promot Pract*. 2024;25(2):227-234. https://doi.org/10.1177/15248399221124598
12. Williams DR, Yan Yu, Jackson JS, Anderson NB. Racial differences in physical and mental health: socio-economic status, stress and discrimination. *J Health Psychol*. 1997;2(3):335-351. https://doi.org/10.1177/135910539700200305
13. Dolan ED, Mohr D, Lempa M, et al. Using a single item to measure burnout in primary care staff: a psychometric evaluation. *J Gen Intern Med*. 2015;30(5):582-587. https://doi.org/10.1007/s11606-014-3112-6
14. Richmond VP, Gorham J, Wrench JS. *Communication Affect & Learning in the Classroom: A Text, Workbook and Study Guide*. Tapestry Press; 2001.
15. Cohen S, Williamson, G. Chapter 3. Perceived stress in a probability sample of the United States. In Spacapan S, Oskamp S eds. *The Social Psychology of Health: Claremont Symposium on Applied Social Psychology*. Sage; 1988.
16. Robeldo, C. COVID19 Impact on health and wellbeing survey (CIHWS). The University of Texas Rio Grande Valley School of Medicine. Accessed June 12, 2024. https://www.phenxtoolkit.org/toolkit_content/PDF/UTRGV_CIHWS_Anxiety.pdf
17. Yanos PT, Vayshenker B, DeLuca JS, O'Connor LK. Development and validation of a scale assessing mental health clinicians' experiences of associative stigma. *Psychiatr Serv*. 2017;68(10):1053-1060. https://doi.org/10.1176/appi.ps.201600553
18. King M, Dinos S, Shaw J, et al. The stigma scale: development of a standardised measure of the stigma of mental illness. *Br J Psychiatry*. 2007;190:248-254. https://doi.org/10.1192/bjp.bp.106.024638
19. Cook-Cottone CP. *Mindfulness and Yoga for Self-Regulation: A Primer for Mental Health Professionals*. Springer Publishing Company; 2015.
20. Zimet GD, Powell SS, Farley GK, Werkman S, Berkoff KA. Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *J Pers Assess*. 1990;55(3-4):610-617. https://doi.org/10.1080/00223891.1990.9674095
21. Hammer TH, Saksvik PØ, Nytrø K, Torvatn H, Bayazit M. Expanding the psychosocial work environment: workplace norms and work-family conflict as correlates of stress and health. *J Occup Health Psychol*. 2004;9(1):83-97. https://doi.org/10.1037/1076-8998.9.1.83
22. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med*. 2008;15(3):194-200. https://doi.org/10.1080/10705500802222972
23. Smith JA, Flowers P, Larkin M. *Interpretative Phenomenological Analysis. Theory, Method and Research*. Sage; 2009.
24. Hare Bork R, Robins M, Schaffer K, Leider JP, Castrucci BC. Workplace perceptions and experiences related to COVID-19 response efforts among public health workers - Public Health Workforce Interests and Needs Survey, United States, September 2021-January 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(29):920-924. Published July 22, 2022. https://doi.org/10.15585/mmwr.mm7129a3
25. Tiesman HM, Hendricks SA, Wiegand DM, et al. Workplace violence and the mental health of public health workers during COVID-19. *Am J Prev Med*. 2023;64(3):315-325. https://doi.org/10.1016/j.amepre.2022.10.004
26. Kent State University College of Public Health. The public health response to the East Palestine train derailment. Updated February 13, 2024. Accessed June 12, 2024. https://www.kent.edu/today/news/public-health-response-east-palestine-train-derailment
27. Kim D. Does paid vacation leave protect against depression among working Americans? A national longitudinal fixed effects analysis. *Scand J Work Environ Health*. 2019;45(1):22-32. https://doi.org/10.5271/sjweh.3751
28. Shiri R, Turunen J, Kausto J, et al. The effect of employee-oriented flexible work on mental health: a systematic review. *Healthcare (Basel)*. 2022;10(5):883. https://doi.org/10.3390/healthcare10050883