HHS Public Access

Author manuscript

Eur J Trauma Dissociation. Author manuscript; available in PMC 2024 December 01.

Published in final edited form as:

Eur J Trauma Dissociation. 2023 December ; 7(4): . doi:10.1016/j.ejtd.2023.100349.

Monkeypox-Induced Secondary Traumatic Stress: An Exploratory Analysis of Young Sexual and Gender Minority Adults Living in Illinois

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Abstract

Objective: Prior epidemic literature suggests that the rapid proliferation of Monkeypox (Mpox) within the United States may trigger severe stress reactions that increase the risk of developing secondary traumatic stress among young adults most at risk of exposure. The present exploratory study aimed to investigate the degree to which proximity to Mpox (i.e. knowing people who acquired Mpox), was associated with symptoms of secondary traumatization.

Method: An online survey was administered to 253 participants enrolled in Keeping it LITE, a prospective U.S. cohort study of ethnically diverse, sexually active, sexual and gender minority persons ages 19–39 in September 2022. A multiple linear regression was used to examine the association between proximity to Mpox and secondary traumatic stress (STS) symptoms.

Results: Study findings demonstrated that Mpox morbidity was low (1%); however, 37% of participants reported knowing at least one person diagnosed with Mpox. For most individuals, this person was a friend (28%). 16% of participants were found to have at least one indicator of Mpox-related STS. Results of our multiple linear regression demonstrated a positive association between an individual's indirect exposure to Mpox via their interpersonal relationships and STS symptoms.

Conclusions: Findings suggest that the more adults' interpersonal relationships are saturated with people who have acquired Mpox, the more likely they are to develop symptoms of secondary traumatization. These findings provide tentative initial evidence that secondary exposure to Mpox via one's social network may undermine adults' mental health even after the conclusion of the outbreak.

Keywords

Monkeypox; Secondary Trauma; Interpersonal Relationships; Mental Health; Stress

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Introduction

Monkeypox (Mpox), a zoonotic disease caused by an orthopoxvirus, is a growing public health concern. Between January 1, 2022, and September 30, 2022, an outbreak of Mpox resulted in a total of 68,428 confirmed cases and 8 deaths; most cases were from countries where Mpox is not endemic (Centers for Disease Control and Prevention, 2022a). Of these, the outbreak was largest in the United States (U.S.), with the plurality of all cases at 25,850 (Centers for Disease Control and Prevention, 2022a). Mpox can be transmitted from one person to another by close contact with lesions, respiratory droplets, and contaminated materials such as bedding (Kaler et al., 2022). While epidemiological investigations to determine the origins of the current outbreak are ongoing, public health response efforts in the U.S. have generally focused on sexual transmission routes and have identified young men who have sex with men (MSM) among the most at-risk (Bragazzi et al., 2022). As of October 2022, daily reported cases of Mpox are steadily decreasing in the U.S. (Centers for Disease Control and Prevention, 2022b), yet the impact of the outbreak persists; public health scholars, policymakers, and interventionists must understand the mental health effects of the Mpox outbreak to provide comprehensive emergency support services, particularly among young sexual minority adults.

Epidemics, such as COVID-19 and Mpox, have been linked to a variety of negative mental health impacts (Ahmed et al., 2022; Kumar & Nayar, 2021). The signs and symptoms of Mpox, as well as the methods of controlling its spread (e.g., quarantining), have been linked to stressors such as fear, panic, anxiety, anger, boredom, exhaustion, social isolation, financial loss, and stigma (Aroyewun et al., 2022; Mungmunpuntipantip et al., 2022). Given the multiplicity of stressors associated with Mpox, it is highly plausible that the current outbreak could lead to severe mental stress among those at risk, including secondary traumatic stress (STS). STS refers to a set of psychological symptoms that mimic post-traumatic stress disorder (PTSD), but that are acquired through vicarious exposure to persons suffering the effects of trauma (Baird & Kracen, 2006; Beck, 2011). Symptoms of STS include feelings of exhaustion, hypervigilance, avoidance, and numbing (McEwen, 1999). Untreated STS can initiate a cascade of psychosocial impairments that negatively impact victims' health and wellbeing over the life course, including damage to the memory and hippocampal neuroplasticity as well as an increased risk of developing symptoms of traumatic stress (Bolton et al., 2004; McEwen, 1999). Secondary exposure to other infectious diseases, such as COVID and HIV, have been linked to an increased risk of both depression and secondary trauma (Kim & Park, 2017; Liu & Liu, 2020). For instance, Lee et al. (2022) demonstrated that among adults, who had never been diagnosed with COVID-19, fear of COVID-19 partially mediated the positive association between secondary exposure to COVID and STS. Furthermore, Graaf (2011) found that the overwhelming majority (93, 7%) of caregivers of people living with HIV or AIDs scored above the cut score for the 75th percentile for STS, indicating that most participants in their study were at relatively high risk of STS as a result of their vicarious exposure to people living with HIV or AIDs. Given this prior research, this an urgent need to examine the vicarious results of the Mpox outbreak.

Much of the research concerning STS during epidemics has focused on the experiences of essential and frontline workers (Franklin & Gkiouleka, 2021; Orru et al., 2021). Several studies have demonstrated clinically significant levels of STS among nurses, doctors, and emergency healthcare workers, with some research indicating that healthcare workers' proximity to people who have contracted COVID-19 is positively associated with more severe manifestations of STS (Franklin & Gkiouleka, 2021). In the case of any epidemic, including both COVID-19 and Mpox, essential and frontline workers are not the only people vicariously exposed; Mpox often spreads via dense, interconnected interpersonal relationships (Holloway, 2022). As such it is not uncommon for individuals who have not contracted Mpox themselves to know many others who have. Studies to date have yet to investigate the secondary traumatization associated with vicarious exposure to Mpox via interpersonal relationships.

Given that the current U.S. Mpox outbreak is primarily spreading among young MSM and members of young MSM's sexual networks, there is a particular need to study this relationship among sexual and gender minority (SGM) youth and young adults, as these communities already experience undue stress burden, which is known to be associated with adverse mental health outcomes (Chang et al., 2022; Meyer, 2003). The current study therefore aimed to ascertain the association between vicarious exposure to Mpox via interpersonal relationships and STS symptoms in an existing virtual cohort study of SGM youth and young adults living in Illinois during September 2022. Examining the effects of vicarious Mpox exposure and STS among SGM youth and young adults requires consideration of preexisting factors associated with both vicarious exposure to Mpox and STS. SGM who have been vicariously exposed to Mpox may differ in life-course trajectories from those no exposed, resulting in a spurious association between becoming vicarious exposure to Mpox and STS. As such we controlled for factors that prior literature suggests might be associated with vicarious exposure to Mpox such as attempted to be vaccinated but could not, Mpox-related psychological distress, Mpox-related heterosexism, Mpox morbidity stigma, fear of social rejection due to Mpox, Mpox concealment, and Mpox vaccine uptake (Chang et al., 2022). We also controlled for several contextual factors potentially associated with STS including age, relationship status, single, identity-based discrimination, food insecurity, employed within the last 5 years, presence of a chronic illness, racial/ethnic identity, gender identity, and sexual identity (Dworkin et al., 2016).

Method

Parent Study

Keeping it LITE examined HIV risk factors in youth and young adults enrolled from December 2017 through December 2019 (n=3,444; Fitch et al., 2022). Baseline eligibility requirements include living in the U.S.; identifying as a cis- or transgender man, transgender woman, or non-binary person who has sex with persons assigned male at birth; being between the ages of 13 and 34; and reporting an HIV-negative test or receiving an HIV diagnosis in the last year. In addition, participants 18 and older were required to report at least one of the following in the last 6 months: 1) condomless anal sex; 2) sex with a partner living with HIV; or 3) a bacterial sexually transmitted infection (STI). Participants aged

13–17 were eligible if they reported engaging in condomless oral sex with a person assigned male at birth. Recruitment methods include word of mouth, digital advertising, social media messaging, text messaging, and social apps with an LGBT focus (Serrano et al., 2021).

Monkeypox Substudy

All Keeping it LITE participants living in Illinois who continued to actively participate through December of 2021 (n = 469) were offered the opportunity to participate in a substudy focused on the Mpox outbreak. Invitations to a REDCap survey were sent out to the 469 participants; 5 invitations were sent between 09/10/22 and 09/20/22. A total of 322 individuals (68.7%) completed the survey and were compensated with a $20 gift card for their time and attention. Participants provided written informed consent; all study activities were approved and overseen by Cook County Health's (CCH) Institutional Review Board (IRB #17-555-CORE). We limited the cases included in this study to those with no-missingness, resulting in a final analytic sample of 253 participants.

Measures

Mpox-Related Secondary Traumatic Stress.—A shortened 6-item version of the PTSD Checklist-5 (PCL-5) was used to measure the negative impact of indirect exposure to traumatic events (Blevins et al., 2015). Participants were asked to indicate how much each of the items bothered them related to Mpox, rating responses on a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*). Responses are summed to get an Mpox-STS score. Cronbach's alpha was .95.

Mpox Exposure.—Participants were asked if their family members, friends, serious partner/spouse, sexual partners, and coworkers had ever tested positive for Mpox. These dichotomized items (no = 0; yes = 1) were summed to produce a total Mpox exposure score.

Mpox Vaccination Attempts.—Participants responded either no (0) or yes (1) if they ever tried to get vaccinated against Mpox but were unable.

Mpox-Related Psychological Distress.—Mpox-related psychological distress was measured using an adapted 8-item version of the Pandemic Stress Index, which measures the impact of infectious disease outbreaks on participant wellbeing (Kujawa et al., 2020). Participants were asked to indicate to what degree they were impacted by negative events related to Mpox, rating responses on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Responses are summed to get an Mpox-related psychological distress score. Cronbach's alpha was .98.

Mpox-Related Heterosexism.—Captured by asking participants to rate their agreement on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) with the following three items: 1) Monkeypox infection means you are promiscuous. 2) A person with monkeypox has engaged in same-sex sexual behavior. 3) It is safe to assume that a person with monkeypox is gay. Cronbach's alpha was .83.

Mpox Morbidity Stigma.—Captured using a four-item scale. Participants were asked to rate their agreement using a 7-point Likert scale with the following statements: 1) I would avoid people who have monkeypox. 2) People with monkeypox have participated in immoral activities. 3) People with monkeypox engaged in irresponsible behavior. 4) It's one's own fault for contracting monkeypox. Cronbach's alpha was .74.

Mpox related fear of social rejection.—Three items were used to develop the scale of Mpox related fear of social rejection. Using the abovementioned 7-point Likert scale, participants were asked to rate their agreements with the following statements: 1) Those with monkeypox will face social rejection. 2) I will not share my monkeypox history even after recovery, out of the fear of rejection. 3) If I contract monkeypox, people will think I am gay. Cronbach's alpha was .78.

Mpox Concealment.—This scale was developed using the following two items: 1) If I contract monkeypox, I will not tell anyone. 2) I will not share my monkeypox history even after recovery, out of the fear of rejection.

Identity-Based Discrimination.—Experiences of identity-based discrimination were assessed using the 10-item version of the Intersectional Day-to-day Discrimination Index (Scheim & Bauer, 2019). Participants are asked how often a variety of experiences have happened to them in their "day-to-day life" in the past year. Items were rated for frequency on a 4-point Likert-type scale from 0 (*never*) to 3 (*yes, many times in the past year*). Items were summed to produce an identity-based discrimination sum score where higher scores correspond to a higher frequency of identity-based discrimination. Cronbach's alpha was .92.

Food Insecurity.—Participants reported either no (0) or yes (1) if they had recently bought food for their household in the last 12 months that did not last, and they were unable to purchase more.

Presence of a Chronic Illness.—Participants reported either no (0) or yes (1) if they had a chronic health problem, such as asthma or diabetes.

Mpox Vaccine Positive.—Participants reported either no (0) or yes (1) if they had received the Mpox vaccine.

Demographics.—Demographic information, including age, relationship status, employment status, racial/ethnic identity, gender identity, transgender identity, and sexual identity, was also collected.

Analytic Approach

The following analyses were conducted: (a) a descriptive analysis of the variables (means and standard deviations); (b) Pearson correlation analysis of Mpox outbreak variables using the SPSS 26.0 program; and (c) multiple linear regression to examine the association between proximity to Mpox and STS symptoms while accounting for the contribution of

relevant crisis and contextual covariates using Mplus 28.0. The reliability of the scales used was established through Cronbach's alpha index.

Results

Descriptive Data and Correlations

Per Table 1, the sample primarily identified their gender as man/boy (82%). 13% of all participants identify as being transgender. The remainder of the sample identified as non-binary (9%), woman/girl (3%), Two-Spirit (1%), and questioning their gender identity (1%). Nearly three-quarters of the sample identified as gay (73%), with 10% identifying as bisexual. Substantially fewer individuals identified as heterosexual, lesbian, pansexual, or questioning. The sample was a mean age of 30 years (SD = 4.7). Most participants identified as White American (53%). The remainder of the sample identified as Black American (12%), Asian American (6%), Multiracial (10%), and Latinx American (18%). Finally, more than one third of the sample (36%) knew at least one person who had tested positive for Mpox.

Table 2 shows the two-tailed bivariate correlations among the variables included in the final analysis where Mpox-related secondary traumatic stress (DV) shows a moderately positive, and significant correlation with vicarious exposure to Mpox ($r = .15$), Mpox-related psychological distress ($r = .27$), and Mpox morbidity stigma ($r = .18$). Mpox-related heterosexism also shows a strongly positive, and significant correlation with Mpox morbidity stigma ($r = .60$) and a strong, positively significant correlation with Mpox-related fear of social rejection ($r = .46$).

Multiple Linear Regression

Table 3 presents the unstandardized results of the multiple linear regression; we provide standardized results in-text. An individual's indirect exposure to Mpox via their interpersonal relationships was positively associated with STS symptoms ($\beta = .16$, $p < .05$; 95% CI [.01, .30]). Furthermore, Mpox-related psychological distress ($\beta = .24$, $p < .01$; 95% CI [.07, .39]), Mpox morbidity stigma ($\beta = .21$, $p < .05$; 95% CI [.05, .37]), fear of social rejection due to Mpox ($\beta = -.22$, $p < .01$; 95% CI [−.37, −.05]), and identity-based discrimination ($\beta = .18$, $p < .05$; 95% CI [.02, .34]) emerged as significant predictors.

Discussion

Our findings demonstrated that despite low levels of Mpox morbidity, more than one-third of participants in our sample knew at least one person diagnosed with Mpox. Furthermore, 16% of participants were found to have at least one indicator of Mpox-related STS. We also found a positive association between vicarious exposure to Mpox and symptoms of STS. Results indicated that the more adults' interpersonal relationships were saturated with people who had acquired Mpox, the more likely they were to develop symptoms of secondary traumatization. Findings corroborate prior research that suggests that essential and healthcare workers can develop symptoms of STS when exposed to those who have been affected by an infectious disease such as Mpox or COVID-19 (Orru et al., 2021). For instance, Zhong et al. (2021) demonstrated that increased vicarious exposure to COVID-19,

and its effects, via social media were associated with increased STS and predicted health behavior change during the public health crisis. We extended research in this area by demonstrating that similar processes may be occurring among other populations with a higher likelihood of knowing individuals impacted by infectious diseases. Specifically, we observed this relationship among young SGM, particularly young MSM and individuals who are members of young MSM's sexual networks. A possible explanation for this association may be that vicarious exposure to the physical pain and psychological suffering associated with Mpox, and the fear of being infected, may serve as a persistent socioecological traumatic stimulus that increases individuals' likelihoods of developing STS symptoms. There is also the possibility that, given that our population of focus already experiences an undue burden of identity-related stress and discrimination, fear of further stigmatization associated with infectious diseases may contribute to traumatic stress responses; the significant role of identity-related discrimination in our model lends some credence to this interpretation. Each of these possibilities should be considered for future study.

From a policy and intervention perspective, our results suggest that the Mpox outbreak may be having significant mental health effects that are currently going unacknowledged, undocumented, and untreated, and could be contributing to worsening mental health disparities among young SGM populations. Prior literature suggests that early intervention via strategic programming and policies can substantially reduce the proximal and longitudinal mental health effects of socionatural disasters (Orru et al., 2020). For instance, participating in SPIN-CHAT, a multi-faceted videoconference-based group intervention designed to provide mental health coping education and practice and foster social support to reduce isolation for those impacted by COVID-19, was associated with significant decreases in anxiety and depression symptoms 6 weeks after participation (Thombs et al., 2021). While prior interventions and policies have focused on ameliorating experiences of depression, anxiety, isolation, and loneliness, our findings indicate that future interventions may also need to attend to symptoms of STS. The need for such interventions may be especially important for young sexual minority adults, as this community is already disproportionately burdened by mental health and psychiatric disorders (Russell & Fish, 2016). These findings also highlight the need for further research examining the longitudinal associations between vicarious exposure to infectious disease morbidity and secondary traumatic stress among diverse groups of people with varying contexts.

Limitations

Our study had several limitations. First, this study used a nonprobability and cross-sectional sampling strategy, which limits our ability to generalize findings to broader populations or draw causal conclusions. Second, the study also implemented a retrospective self-report data collection strategy, which presents a risk for recall and social desirability biases. Despite these limitations, this study provides important insights into the association between vicarious exposure to Mpox via interpersonal relationships and symptoms of secondary traumatic stress.

Conclusions

Our findings suggest that the developing Mpox outbreak may be increasing individuals' vicarious exposures to physical pain and psychological suffering, which may be increasing rates of Mpox-related secondary traumatization among SGM and members of MSM's sexual networks. The prevalence of STS symptoms and its long-term effects on individuals' mental wellbeing need to be further investigated with longitudinal studies. Large-scale screening in highly exposed or more vulnerable populations is also needed to identify the most at-risk groups who may need targeted treatment to prevent long-term psychological and health consequences. Even as daily case rates of Mpox decrease in the U.S., the impacts of this outbreak are likely still being felt, and demand a compassionate, trauma-informed public health response.

Declaration of interests

Audrey L. French & Sybil G. Hosek reports financial support was provided by National Institute of Allergy and Infectious Diseases, National Institute of Mental Health, and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

This work was in part supported by the National Institute of Allergy and Infectious Diseases, National Institute of Mental Health, and the Eunice Kennedy Shriver National Institute of Child Health and Human Development under Grant Award Number UH3AI133676/UG3AI133676. The content is solely the authors' responsibility and does not necessarily represent the official views of the NIH. The analysis presented was not disseminated prior to the creation of this article; however, this study's dataset has been used in prior unrelated publications. We have no known conflicts of interest to disclose. M.G.C. conceptualized the study and led the analysis and writing. S. D., A. E. R. O., D. F., A. L. F., S. G. H., P. A. S., & G. P. II provided substantial contributions and supported the analysis, review, and editing of the article.

Reference

Ahmed SK, M-Amin HI, Abdulqadir SO, Hussein SH, Ahmed ZK, Essa RA, Khdir AA, Abdulla AQ, & Omar RM (2022). Timely mental health care for the 2022 novel monkeypox outbreak is urgently needed. Annals of Medicine and Surgery. https://doi.org/10/gr3dcx

Aroyewun TF, Olaleye SO, Adebisi YA, & Yusuf M (2022). Mental health implications of monkeypox: An urgent need for action. Ann Med Surg (Lond), 82, 104771. https://doi.org/10/gr3c54 [PubMed: 36164643]

Baird K, & Kracen AC (2006). Vicarious traumatization and secondary traumatic stress: A research synthesis. Counselling Psychology Quarterly, 19(2), 181–188. https://doi.org/10/cqnvhq

Beck CT (2011). Secondary traumatic stress in nurses: A systematic review. Arch Psychiatr Nurs, 25(1), 1–10. https://doi.org/10/dfd4f4 [PubMed: 21251596]

Blevins CA, Weathers FW, Davis MT, Witte TK, & Domino JL (2015). The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. J Trauma Stress, 28(6), 489–498. https://doi.org/10/f72jcr [PubMed: 26606250]

Bolton D, Hill J, O'Ryan D, Udwin O, Boyle S, & Yule W (2004). Long-term effects of psychological trauma on psychosocial functioning. J Child Psychol Psychiatry, 45(5), 1007–1014. https://doi.org/10/bzdmc7 [PubMed: 15225342]

Bragazzi NL, Khamisy-Farah R, Tsigalou C, Mahroum N, & Converti M (2022). Attaching a stigma to the LGBTQI+ community should be avoided during the monkeypox epidemic. Journal of Medical Virology.

Centers for Disease Control and Prevention. (2022a). Global Map and Case Count. Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention. (2022b). US Monkeypox Case Trends Reported to CDC Data as of 10/07/2022. Day Daily Average.

Chang CT, Thum CC, Lim XJ, Chew CC, & Rajan P (2022). Monkeypox outbreak: Preventing another episode of stigmatisation. Tropical Medicine & International Health, 27(9), 754–757. https://doi.org/10/gr3c6d [PubMed: 35779015]

Dworkin ER, Sorell NR, & Allen NE (2016). Individual-and setting-level correlates of secondary traumatic stress in rape crisis center staff. Journal of Interpersonal Violence, 31(4), 743–752. https://doi.org/10/f76pp6 [PubMed: 25381285]

Fitch C, Haberer JE, Serrano PA, Muñoz A, French AL, & Hosek SG (2022). Individual and structural-level Correlates of Pre-exposure Prophylaxis (PrEP) lifetime and current use in a nationwide sample of young sexual and gender minorities. AIDS and Behavior, 1–13.

Franklin P, & Gkiouleka A (2021). A Scoping Review of Psychosocial Risks to Health Workers during the Covid-19 Pandemic. Int J Environ Res Public Health, 18(5), 2453. https://doi.org/10/gr3cv7 [PubMed: 33801517]

Graaf PM (2011). Associations between personal attributes and compassion fatigue, compassion satisfaction and burnout among caregivers of people living with HIV and AIDS [University of Zululand]. https://uzspace.unizulu.ac.za/items/cd99ea9b-352a-4294-baae-83931320ef4b

Holloway IW (2022). Lessons for Community-Based Scale-Up of Monkeypox Vaccination From Previous Disease Outbreaks Among Gay, Bisexual, and Other Men Who Have Sex With Men in the United States. American Public Health Association.

Kaler J, Hussain A, Flores G, Kheiri S, & Desrosiers D (2022). Monkeypox: A comprehensive review of transmission, pathogenesis, and manifestation. Cureus, 14(7).

Kim H-J, & Park H-R (2017). Factors affecting post-traumatic stress of general hospital nurses after the epidemic of Middle East respiratory syndrome infection. Journal of Korean Clinical Nursing Research, 179–188.

Kujawa A, Green H, Compas BE, Dickey L, & Pegg S (2020). Exposure to COVID-19 pandemic stress: Associations with depression and anxiety in emerging adults in the United States. Depress Anxiety, 37(12), 1280–1288. https://doi.org/10/gjz5r3 [PubMed: 33169481]

Kumar A, & Nayar KR (2021). COVID 19 and its mental health consequences. Taylor & Francis.

Lee S, Kim HR, & Kim B (2022). The impact of fear of COVID-19 on the impact of event and indirect trauma. Archives of Psychiatric Nursing, 41, 306–311. 10.1016/j.apnu.2022.09.003 [PubMed: 36428065]

Liu C, & Liu Y (2020). Media exposure and anxiety during COVID-19: The mediation effect of media vicarious traumatization. International Journal of Environmental Research and Public Health, 17(13), 4720. [PubMed: 32630054]

McEwen BS (1999). Stress and hippocampal plasticity. Annu Rev Neurosci, 22(1), 105–122. https://doi.org/10/cnfdjj [PubMed: 10202533]

Meyer IH (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. Psychological Bulletin, 129(5), 674. https://doi.org/10/ctz7wp [PubMed: 12956539]

Mungmunpuntipantip R, Sriwijitalai W, & Wiwanitkit V (2022). Anxiety, depression and monkeypox. Medp Psychiatry Behav Sci, 1(1).

Orru G, Marzetti F, Conversano C, Vagheggini G, Miccoli M, Ciacchini R, Panait E, & Gemignani A (2021). Secondary Traumatic Stress and Burnout in Healthcare Workers during COVID-19 Outbreak. Int J Environ Res Public Health, 18(1), 337. https://doi.org/10/gj83p3 [PubMed: 33466346]

Russell ST, & Fish JN (2016). Mental health in lesbian, gay, bisexual, and transgender (LGBT) youth. Annual Review of Clinical Psychology, 12, 465. https://doi.org/10/gfj4mw

Scheim AI, & Bauer GR (2019). The Intersectional Discrimination Index: Development and validation of measures of self-reported enacted and anticipated discrimination for intercategorical analysis. Social Science & Medicine, 226, 225–235. https://doi.org/10/ggw6nt [PubMed: 30674436]

Serrano PA, Daubert E, Munoz A, Hosek SG, & French AL (2021). Effect of Truvada lawsuit advertising on preexposure prophylaxis attitudes and decisions among sexual and gender minority youth and young adults at risk for HIV. AIDS, 35(1), 131–139. https://doi.org/10/gmmr7s [PubMed: 33031102]

Thombs BD, Kwakkenbos L, Levis B, Bourgeault A, Henry RS, Levis AW, Harb S, Tao L, Carrier M-E, & Bustamante L (2021). Effects of a multi-faceted education and support programme on anxiety symptoms among people with systemic sclerosis and anxiety during COVID-19 (SPIN-CHAT): A two-arm parallel, partially nested, randomised, controlled trial. The Lancet Rheumatology, 3(6), e427–e437. https://doi.org/10/gmz2s8 [PubMed: 33899008]

Zhong B, Huang Y, & Liu Q (2021). Mental health toll from the coronavirus: Social media usage reveals Wuhan residents' depression and secondary trauma in the COVID-19 outbreak. Computers in Human Behavior, 114, 106524. [PubMed: 32836728]

Clinical Impact Statement

Prior literature has demonstrated how the acquisition of certain infectious diseases, such as Monkeypox (Mpox), can trigger severe stress reactions that, when left untreated, can initiate a cascade of psychosocial impairments that negatively impact individuals' mental health and wellbeing. The current study expands upon prior research by demonstrating how secondary exposure to Mpox (i. e. via one's social network) can trigger similar severe stress reactions, even when individuals have never directly acquired the virus. Our results further emphasize the importance of addressing the detrimental effects of secondary infectious disease exposure in future intervention-prevention programming and policy.

Table 1.

Participant Demographics

Characteristic	M	SD	(*n* = 253)
Exposure to Mpox			
Self			5 (2%)
Family Member			2 (1%)
Friends			88 (28%)
Serious partner/spouse			2 (1%)
Sexual partners			10 (3%)
Co-workers			9 (3%)
Crisis Factors			
Mpox -Related Traumatic Stress	1.56	4.09	
Mpox Exposure	.40	.64	
Mpox Vaccination Attempts			53 (21%)
Mpox -Related Psychological Distress	18.75	17.10	
Mpox -Related Heterosexism	2.36	1.40	
Mpox Morbidity Stigma	1.94	1.14	
Fear of Social Rejection Due to Mpox	3.65	1.70	
Mpox Concealment	2.39	1.57	
Contextual Factors			
Age	30.25	4.70	
Single (yes/no)			115 (46%)
Identity-Based Discrimination	10.53	7.71	
Food Insecurity	.29	.57	
Employed within the last 5 years			236 (93%)
Presence of a Chronic Illness			45 (18%)
Racial/Ethnic Identity			
White American			135 (53)
Black American			30 (12%)
Asian American			16 (6%)
Multiracial			26 (10%)
Latinx American			46 (18%)
Gender Identity			
Questioning my gender identity			2 (1%)
Woman/Girl			8 (3%)
Man/Boy			207 (82%)
Two-Spirit			3 (1%)
Non-Binary			23 (9%)
Identified as Transgender			34 (13%)
Sexual Identity			

Characteristic	**M**	**SD**	**(*n* = 253)**
Questioning my sexual orientation			2 (1%)
Bisexual			25 (10%)
Pansexual			3 (1%)
Gay			184 (73%)
Lesbian			2 (1%)
Straight (Heterosexual)			3 (1%)

Table 2.

Two-Tailed Bivariate Correlations Among Study Variables

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Mpox -Related Secondary Traumatic Stress	1														
2	Mpox Exposure	.15*	1													
3	Mpox Vaccination Attempts	.07	.07	1												
4	Mpox -Related Psychological Distress	.27**	.01	−.04	1											
5	Mpox -Related Heterosexism	.12	.13*	−.04	.09	1										
6	Mpox Morbidity Stigma	.18**	−.07	−.12	.13*	.60**	1									
7	Fear of Social Rejection Due to Mpox	−.07	.00	.15*	.01	.46**	.30**	1								
8	Mpox Concealment	.01	−.05	.07	−.06	.32**	.30**	.40**	1							
9	Age	−.04	.23**	.05	−.10	.06	−.09	−.04	−.06	1						
10	Single (yes/no)	.07	.04	−.04	.06	.04	.09	−.04	−.04	−.04	1					
11	Identity-Based Discrimination	.07	−.05	.16**	−.07	.13*	−.07	.09	.00	−.16**	−.10	1				
12	Food Insecurity	.12	−.05	−.03	.12	−.01	.15*	−.15*	−.02	−.25**	.12*	.25**	1			
13	Employed within the last 5 years	−.12	.07	.11*	−.03	−.13*	−.21**	−.07	−.12	.11*	−.05	−.03	−.22**	1		
14	Presence of a Chronic Illness	.00	−.03	.10	−.01	−.12*	−.07	−.11	−.11	−.07	−.05	.17**	.21**	−.09	1	
15	Mpox Vaccine Positive	.00	.30**	.10	−.09	.00	−.15*	−.11	−.12	.22**	.03	−.20**	−.30**	.23**	−.16**	1

Table 3.

Unstandardized results of multiple linear regression analysis predicting Monkeypox-related secondary traumatic stress

		B	SE	*P*	95% CI	
					Lower	*Upper*
Crisis Factors						
Mpox Exposure		1.11	.55	.042	.059	2.189
Mpox Vaccination Attempts		1.15	.71	.102	−.097	2.631
Mpox - Related Psychological Distress		.06	.02	.021	.014	.112
Mpox - Related Heterosexism		.13	.21	.536	−.247	.588
Mpox Morbidity Stigma		.75	.30	.013	.194	1.380
Fear of Social Rejection Due to MPOX		−.53	.23	.020	−1.010	−.109
Mpox Concealment		.02	.16	.898	−.299	.313
Contextual Factors						
Age		−.08	.06	.191	−.214	.037
Single (yes/no)		.08	.49	.865	−.897	1.024
Identity-Based Discrimination		.09	.04	.016	.013	.167
Food Insecurity		.05	.56	.930	−1.004	1.186
Employed within the last 5 years		−1.93	1.46	.184	−4.909	.767
Presence of a Chronic Illness		.07	.30	.823	−.498	.667
Mpox Vaccine Positive		.06	.19	.760	−.372	.408
Racial/Ethnic Identity *						
Black American		−.60	.94	.520	−2.351	1.269
Asian American		.08	.75	.913	−1.535	1.454
Multiracial		−.76	.79	.337	−2.337	.782
Latinx American		.02	.78	.979	−1.437	1.652
Gender Identity						
Questioning my gender identity		−.50	1.45	.732	−3.706	2.103
Woman/Girl		−.34	2.11	.874	−4.772	3.609
Man/Boy		−.09	.85	.920	−2.051	1.365
Two-Spirit		−2.75	2.19	.208	−8.360	.743
Non-Binary		.40	.98	.680	−1.619	2.312
Identified as Transgender		−.74	.50	.135	−1.757	.178
Sexual Identity						
Questioning my sexual orientation		−2.96	1.86	.111	−7.257	.431
Bisexual		.09	1.19	.937	−1.945	2.729
Pansexual		1.05	1.67	.527	−2.513	4.151
Gay		.62	.80	.435	−.773	2.431
Lesbian		−1.22	1.20	.312	−4.404	.723

		B	SE	*P*	95% CI	
					Lower	*Upper*
Straight (Heterosexual)		1.07	2.69	.690	−3.834	6.581

Note. SE = standard error,

* = vs White