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Cross-sectional survey of sexual health professionals' experiences and perceptions of the 2022 mpox outbreak in the UK

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ABSTRACT

Objective To understand the experiences and perceptions of sexual health professionals responding to the May 2022 mpox outbreak in the UK.

Design Cross-sectional, anonymous, online survey collecting quantitative and qualitative data. Convenience sample recruited via an international network of sexual health and HIV clinicians responding to mpox and promoted through clinical associations and social media. Survey domains included: clinical workload; preparedness, support, and training; safety at work; vaccination; and well-being. Qualitative descriptive analysis of open-text responses was conducted to support interpretation of the quantitative data.

Participants Participants who were employed as sexual health professionals in the UK and had direct clinical experience of mpox were included in the analysis. The survey was completed between 11 August and 31 October 2022 by 139 respondents, the majority of whom were doctors (72.7%), cis-female (70.5%) and White (78.4%).

Results 70.3% reported that they were required to respond to mpox in addition to their existing clinical responsibilities, with 46.8% working longer hours as a result. In the open-text data, respondents highlighted that workload pressures were exacerbated by a lack of additional funding for mpox, pre-existing pressures on sexual health services, and unrealistic expectations around capacity. 67.6% of respondents reported experiencing negative emotional impact due to their mpox work, with stress (59.0%), fatigue (43.2%) and anxiety (36.0%) being the most common symptoms. 35.8% stated that they were less likely to remain in their profession because of their experiences during the mpox outbreak. In the open-text data, these feelings were ascribed to post-COVID exhaustion, understaffing and frustration among some participants at the handling of the mpox response.

Conclusions These findings indicate that sexual health services require increased funding and resources, along with evidence-based well-being interventions, to support sexual health professionals' outbreak preparedness and recovery.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study is one of the first to explore the experiences of sexual health professionals responding to mpox in the UK, with data collected during the height of the outbreak.
- ⇒ The collection of qualitative data via open-text questions helped to contextualise quantitative findings and centre sexual health professionals' experiences and voices within the study.
- ⇒ The convenience sampling strategy means the respondents and perspectives presented in this study may not be representative of the wider UK sexual and reproductive health workforce.
- ⇒ The exploratory nature of the study constrained statistical analysis, as it was underpowered to explore associations between variables.

BACKGROUND

There is increasing awareness of the pressures that pandemics and their system-wide management place on healthcare professionals' physical, mental and emotional health.[1] The arrival of SARS-CoV-2 exposed multiple threats to healthcare professional well-being including fear of contagion (and subsequent transmission to others), exacerbated by a lack of adequate personal protective equipment (PPE), inadequate and rapidly changing guidance and training, and inconsistent information.[2–4] Staff also faced higher workloads, disruptions to daily routines and team dynamics, negative impacts on personal and professional identity, and threats to psychological safety.[2,5] Outside of work, healthcare professionals also experienced stigma in the community (related to fear of contagion) and disruptions to family relationships.[2,4]

May 2022 marked the beginning of what became the largest and geographically most widespread mpox (formerly monkeypox) outbreak to be reported outside the principal historically affected countries in western and central Africa. Within 3 months, the outbreak was declared a Public Health Emergency of International Concern by the WHO,[6] coinciding with a time when health systems were already significantly overstretched by the ongoing COVID-19 pandemic.[7]

Known risk factors for acquiring mpox include contact with fomites, bodily fluids and airborne droplets,[8–10] and the most evidenced and protective non-behavioural intervention is the smallpox vaccine.[11 12] The latest outbreak, however, differed from previous outbreaks and presented new challenges. First, the timing of the outbreak coincided with the lifting of travel and other restrictions associated with the COVID-19 pandemic, with early cases linked to the recommencing of large events, parties and increases in close social and sexual contact.[13] Second, unlike previous outbreaks of mpox, transmission has been associated with sexual networks of gay or bisexual men and other men who have sex with men. Third, clinical presentation has changed and now frequently includes anogenital lesions.[14] These combined factors have put sexual health professionals on the frontline of the response.

Between 6 May 2022 to 30 September 2023, there were 3732 cases of mpox in the UK, with 95% of these cases confirmed in England.[15] At the peak of the outbreak, in July 2022, UK sexual health services were dealing with 350 cases of mpox every week.[15] The unanticipated pressure of mpox was layered on an already overstretched and depleted sexual and reproductive health workforce. In addition to COVID-19-associated disruption and burnout, sexual and reproductive health services were dealing with an ongoing crisis in recruitment and retention of staff[16–18] coupled with reduced funding and rising demand for services.[19] Unlike most clinical services, sexual health services in England are funded from highly constrained local authority public health budgets rather than from central health system's funds in the National Health Service (NHS). As well as risking increased transmission of mpox, clinical leaders noted that unexpected and unfunded mpox clinical activity was competing with and displacing core sexual and reproductive health services, threatening the sustainability of services and public health.[20]

Given this context, mpox likely placed a significant burden on sexual health professionals. However, beyond data on exposure risks of mpox in healthcare settings,[21 22] little is known so far about the wider experience and impact of the outbreak on sexual health professionals. We sought to address this gap by conducting a rapid appraisal of the experiences and perceptions of UK sexual health professionals involved in the response to the 2022 multicountry mpox outbreak.

METHODS

Between 11 August and 31 October 2022, a cross-sectional, anonymous, online survey was conducted with international healthcare professionals involved in the multicountry outbreak of mpox. The questionnaire (available at https://osf.io/dmu65) was developed using literature related to healthcare worker experience of infectious disease outbreaks[2–5] and the clinical expertise within the authorship team (VA, CD, LW, JA, CMO). It was also reviewed by clinical colleagues in several countries within SHARE-Net,[23] an informal network of researchers and clinicians responding to mpox from around the world, established at the beginning of the multicountry outbreak in May. The survey contained 87 new (non-validated) questions, assessing: clinical workload; preparedness, support and training; safety at work; mpox vaccination; well-being; and mpox research. Both closed (single-response and multiresponse questions) and open-text questions were used, as well as questions regarding demographic characteristics (eg, age, gender identity, sexual orientation and ethnicity). The survey was constructed using SmartSurvey software (SmartSurvey, Tewkesbury, UK)[24] and disseminated in English, Spanish, French and Portuguese.

International survey dissemination was via SHARE-Net, as well as via newsletters and social media channels of the British Association for Sexual Health (BASHH), the British HIV Association, European AIDS Clinical Society and International AIDS Society.

The analysis for this paper was restricted to respondents who reported working in sexual health in the UK, as this allowed for greater exploration of country-specific and context-specific factors influencing healthcare professionals' experiences. A manuscript analysing responses from the entire international sample is forthcoming.

Quantitative data analysis was undertaken by MS using Stata V.17 (StataCorp LLC)[25] following a prespecified statistical analysis plan (available at https://osf.io/2bufh). All authors provided iterative feedback. Denominators (n) are shown in the text when missing responses occurred.

The qualitative data collected expanded in open-text boxes on specific questions (eg, 'How satisfied were you with the support your clinic/service received from your national public health agency? Why/why not?'). Qualitative data were analysed using descriptive qualitative analysis[26] in NVivo V.1.7 (Lumivero, Burlington, Massachusetts, USA) as a pragmatic approach to handling large numbers of entries of short textual data. Open-text data were deductively organised by the question's survey domain, then RH inductively generated the coding categories and brief findings within these domains, with iterative feedback from remaining authors. Respondent quotations are provided in each section to provide context to the statistical findings.

Patient and public involvement

No patient and public involvement was conducted as part of this study as the research was focused on the experiences of healthcare professionals. However, our research team includes sexual health and HIV clinicians with firsthand experience of caring for patients with mpox during the 2022 outbreak (VA, CD, LW and CMO). We conducted a separate project to understand the experiences of communities affected by mpox which was coproduced with two community-based organisations involved in sexual health promotion and advocacy.[27]

RESULTS

Participant characteristics

A total of 139 UK respondents completed the survey; their demographics are presented in table 1. Most were doctors (72.7%) or nurses (25.9%). All respondents had been involved clinically with people with mpox. The main sites of care for patients with mpox were sexual health clinics (92.8%), specialist HIV clinics (22.3%), in-patient wards (9.4%) and emergency departments (5.8%). Most respondents identified as cis-female (70.5%). 13.0% of respondents identified as a gay or bisexual man. The majority of the sample identified as White (78.4%).

Table 1 Survey respondent characteristics (n=139)

Category	N	%
Age		
18–25	1	0.7
26–30	12	8.6
31–34	13	9.4
35–40	19	13.7
41–50	47	33.8
51–60	38	27.3
60+	9	6.5
Gender		
Cis-Female	98	70.5
Cis-Male	35	26.2
Trans-Male	1	0.7
Non-binary	2	1.4
Prefer not to say	3	2.2
Do you identify as a gay or bisexual man?		
Yes	18	13.0
No	118	84.9
Prefer not to say	3	2.2
Ethnicity		
White	109	78.4
Black	3	2.2
Asian	13	9.4
Latino/Latinx	1	0.7
Arab	1	0.7
Mixed or multiple ethnic groups	10	7.2
Other	2	1.4
Professional role		
Doctor	101	72.7
Nurse	36	25.9
Health promotion worker	2	1.4
Where did you see suspected or confirmed clinical cases of monkeypox?*		
Sexual health clinic (community, public, private)	129	92.8
Infectious disease clinic	2	1.4
Emergency department	8	5.8
HIV clinic	31	22.3
Dermatology clinic	1	0.7
General practice	1	0.7
In-patient ward	13	9.4

*Participants could select multiple options.

Clinical workload

During the first four weeks of the UK mpox outbreak, over one-third of respondents (33.8%) reported that at least a quarter of their working time was taken up with mpox and 19.4% reported that more than half of their time was mpox-focused. The majority (70.3%) reported that their other existing clinical responsibilities had not been removed to allow them to focus on mpox-related work, with nearly half (46.8%) working longer hours as a result of mpox.

Respondents carried out a range of tasks as part of their mpox-related clinical work, most commonly direct patient care (97.1%), contacting mpox patients or their contacts (73.4%), and developing local protocols and operational guidance (59.0%).

Four themes were identified in the open-text data in relation to mpox-related workload: a lack of additional funding or resources, existing pressures on services, unrealistic expectations around capacity to respond to mpox, and implications for other sexual health services.

Many respondents noted that the increased workload associated with mpox was not matched by additional funding, with some describing a sense that mpox was being 'dumped' on sexual health services. Respondents had to work additional hours as a result and felt there was little recognition for this (including no paid overtime).

> "Expected to do a lot at speed with no additional support or resource."
>
> Respondent 12—Doctor, cis-female, Mixed or Multiple Ethnic Group, aged 35-40.

Others highlighted that understaffing due to COVID-19, along with previous budgetary cuts, meant that these additional responsibilities were being assigned to services already under extreme pressure.

> "I think even before covid the pressure within sexual health was such that it felt like you had to rush through patients and didn't have the time to give the care that was needed"
>
> Respondent 10—Nurse, cis-female, White, aged 35-40.

Reporting requirements to the national public health agency, the UK Health Security Agency (UKHSA) added significant pressure. Some respondents felt that UKSHA's expectations of how sexual health services should respond to the outbreak were unrealistic.

> "There was a significant mismatch between the resources we had and the resources we were expected to devote to the UKHSA processes (reporting cases, reporting on case management, patient follow-ups, attendance at meetings, infection control)"
>
> Respondent 78—Doctor, cis-male, White, aged 41-50.

Respondents attributed this to a lack of understanding about the reality of sexual health services such as staffing levels, the logistics of applying guidance designed for highly controlled in-patient settings to open-access clinics, and having the infrastructure in place for services such as 24-hour on-call rotas. Several respondents were concerned about the impact on other sexual health services.

> "We have had acutely unwell patients EG: Herpes, PID [Pelvic Inflammatory Disease] care unacceptably delayed by the need to phone triage and prioritise monkeypox testing."
>
> Respondent 25—Doctor, cis-female, White, aged 51-60.

Preparedness, support and training

When asked how personally prepared they were for the mpox outbreak, more than three-quarters (81.3%) of respondents said they were not at all or only slightly prepared. Over half (52.5%) of respondents had never heard of mpox prior to the outbreak. Respondents expressed a marked lack of confidence about their ability to care for people with mpox. Over half (56.8%) of respondents described themselves as not at all confident in managing suspected or confirmed mpox cases at the start of the outbreak, with 31.7% suggesting they had initially misdiagnosed a mpox-related rash.

However, 78.4% had received education, training, or instruction about mpox specifically. Most commonly this was in the form of written guidance (60.4%), in-house practice education (54.7%), practical PPE instruction (33.1%), and lectures, webinars, or presentations (31.7%). Of those who had received mpox-related training or education and rated it (n=108), 11.1% rated this entirely adequate, 79.6% rated it fairly or mostly adequate, and 9.3% rated it only slightly or not at all adequate. Less than one-third (27.3%) of respondents had completed any type of general infectious disease outbreak management education and training.

Nearly two-thirds (62.6%) of respondents agreed or strongly agreed that their employing institution had provided clear, timely and authoritative information about mpox. When asked how satisfied they were with the support their clinic or service received from the national public health agency (n=136), 61.8% said they were fairly, mostly or extremely satisfied, and 38.2% said they were only slightly or not at all satisfied.

In the open-text data, those who were satisfied with the response were understanding that the novelty of the outbreak meant that the public health agency initially lacked information about how best to respond, and guidance changed as understanding increased. Others said they felt the public health agency worked well with professional clinical bodies, and that the information and training provided was excellent.

> "UKHSA's knowledge of the infection (which was unavoidably not based on any previous outbreak as sexually transmitted epidemics of mpox are unprecedented in the UK) was made available very early on too via BASHH."
>
> Respondent 78—Doctor, cis-male, White, aged 41-50.

However, some respondents described a lack of strategic leadership which impeded an effective response to mpox. Several respondents described developing their own guidelines and procedures, and felt they were left to make decisions with little external support. Some respondents expressed surprise that so little of the learning from managing COVID-19 was being applied to the mpox outbreak.

> "Each clinic was constantly reinventing the wheel by developing local protocols for MPXV [mpox] patient management, PGD [Patient Group Directions] for vaccinations, vaccination procuring and delivery. This should all have been managed centrally. Nothing learned from the COVID pandemic has been translated to managing the MPXV response."
>
> Respondent 101—Doctor, cis-male, gay/bi man, White, aged 41-50.

Respondents described how the absence of strategic leadership they identified led to poor communication, with clinicians learning about policy changes through the media or from patients and frequent changes in guidance. Some respondents felt that the mixed messaging (particularly in relation to vaccine supply) contributed to patients' frustration, of which frontline clinicians bore the brunt. They felt that the realities of sexual health clinical care were poorly understood.

> "Poorly thought out, unhelpful, and mixed messaging from UKHSA. Unable to tell the truth to patients about vaccine supply leading to huge increase in abuse and aggression for frontline staff. Multiple meetings with multiple different groups—none of whom were talking to each other and many of whom had no idea how a sexual health clinic operated."
>
> Respondent 35—Doctor, cis-female, White, aged 41-50.

Safety at work

The majority (n=85.5%, n=138) of respondents reported that their clinic or service had performed a risk assessment to ensure staff safety when dealing with people with suspected or confirmed mpox. 93.5% rated the mpox infection control precautions in their clinic or service as fairly, mostly or entirely adequate. One respondent reported acquiring mpox, although it is unclear whether the exposure was occupational. Three respondents (2.2%) reported that colleagues had acquired mpox and no respondents reported family members acquiring mpox.

In the open-text data, some respondents expressed concerns about their safety at work, in particular those who felt especially at risk from complications from a potential infection, such as pregnancy, long-COVID, or planned surgery. Some reported feeling that their concerns were not adequately addressed by their employer.

> "I didn't receive a risk assessment at all, just told 'to stay away from Monkeypox', yet I was around potential Monkeypox patients in the waiting room, in clinic and around colleagues seeing patients and diagnosing Monkeypox. Especially inadequate as I couldn't get vaccinated."
>
> Respondent 76—Doctor, cis-female, White, aged 31-34.

In contrast, some respondents felt that infection control procedures were prioritised over patient dignity, resulting in care provision perceived to be stigmatising to patients. The downgrading of mpox from a high-consequence infectious disease classification was perceived by some respondents to have taken too long, contributing to a sense that infection control requirements were excessive and potentially stigmatising given the perceived level of risk.

Vaccination

Less than a quarter (21.7%) of respondents (n=138) had received smallpox vaccination prior to the 2022 mpox outbreak in the UK. By the time of the survey, 69.1% had been offered vaccination against mpox, of whom 70.1% had received the vaccine. However, of those vaccinated (n=83), 34.9% felt they had not received the vaccine in a timely and equitable manner. Overall, 55.8% of respondents (n=138) considered mpox vaccination access in the UK to be not at all adequate, with the key focus being on access for patients. The term 'chaotic' was used by several to describe vaccine delivery to patients, and some respondents felt they were made to provide misleading information to patients about vaccine availability. Several respondents described how the inadequate vaccine supply and poor communication around this meant that delivery was inequitable in its impact on marginalised patients.

> "Not fair that we can't vaccinate everyone in need and that outside London coverage has been terrible. Also, that there's been no decent public messaging, and everything's had to be spread through word of mouth. Disadvantages the un-connected gays."
>
> Respondent 88—Doctor, non-binary, White, aged 31-34.

Well-being

Ninety-four respondents (67.6%) reported experiencing some form of negative emotional impact due to their mpox work, with 50.4% reporting multiple symptoms. The most commonly reported symptoms were stress (59.0%), fatigue (43.2%) and anxiety (36.0%). Stress, fatigue and anxiety were also the most common symptoms experienced by respondents prior to their work on mpox, but at lower rates (38.1%, 30.9%, 20.1%, respectively).

A substantial proportion of respondents reported feeling some level of burnout, either as a result of responding to mpox and COVID-19, or even prior to these outbreaks. 10.8% of all respondents reported feeling considerably or completely burnt out due to their work on mpox, while 54.0% reported feeling slight or moderate feelings of burnout, and 35.3% reported feeling not at all burnt out. Of the 77 (55.4%) respondents who had provided care to COVID-19 patients in the preceding two years, 13.0% reported feeling considerably or completely burnt out prior to the COVID-19 pandemic, 55.8% reported feeling slight or moderate feelings of burnout, and 31.2% reported feeling not at all burnt out.

When asked whether the experience of mpox in addition to the COVID-19 pandemic made them more or less likely to remain in health as a profession, 35.8% stated that they were less likely to remain, only 4.4% stated they were more likely to remain, and the remainder (59.8%) reported no change.

Many respondents ascribed these feelings to exhaustion from having to deal with another outbreak so soon after COVID-19. Some respondents felt that there was a lack of acknowledgement or consideration for the pressure that staff were already under prior to the mpox outbreak.

> "This work coincided with increasing service pressures, and without a resolution of the Covid pandemic (still very stressful to staff). We have had to adapt and shift other clinical tasks, redesign clinics and services without necessarily acknowledging the amount of low staff morale and distress we have all been through."
>
> Participant 50—Doctor, cis-male, White, aged 51-60.

Some respondents described how understaffing meant they did not always feel they could deliver adequate care, which exacerbated their stress. In addition, some felt the way in which the mpox response was handled contributed to the distress and anger of patients.

> "Listening to the very distressing accounts from the MPX [mpox] patients especially those who are frightened & isolating alone and not being able help or support them better."
>
> Participant 8—Doctor, cis-female, White, aged 51-60.

A few respondents expressed anger at patients who they felt did not take the outbreak seriously or lacked empathy for the situation clinicians also found themselves in.

DISCUSSION

Our study, undertaken at the intersection of two major infectious disease outbreaks in the UK in 2022, gives important insights into the challenges that pandemics pose to health professionals. It is one of the first studies to explore the experiences of sexual health professionals responding to mpox in the UK, with data collected at the height of the outbreak. Through the combination of quantitative and qualitative data, our findings paint a picture of an understaffed, under-resourced and underprepared workforce with little resilience to adapt to the challenges of a novel outbreak soon after a recent pandemic. Staff well-being has suffered, with high levels of stress and burnout contributing to staff reporting that they are more likely to leave their profession.

The experiences of respondents in our study support the view that mpox landed on services that were already under huge financial and workforce pressure. Previous studies have identified that inadequate funding and resources for the mpox response has had negative implications for routine sexual healthcare—risking efforts to tackle the competing public health threats of HIV and increasing sexually transmitted infection (STI) rates. A service evaluation of a UK clinic described the temporary cancellation of routine sexual health services, such as warts clinics and vaccinations, in response to the increased workload brought about by the mpox outbreak.[28] Similarly, a US study reported a significant decline in HIV PrEP enrolment and STI testing when STI care was deprioritised by a need to upscale mpox vaccination with limited staff resource.[29] HIV testing rates among certain population groups such as heterosexual men and heterosexual and bisexual women are yet to return to the levels they were prior to the COVID-19 pandemic.[30] Disruption to routine sexual health services including HIV testing threatens the UK's progress towards elimination of HIV transmission.

In addition to concerns about their ability to deliver core sexual health services, respondents highlighted worries about their ability to ensure optimal care for people with or at risk of mpox. A key source of distress identified by this study was the rapidly changing and inadequate information and guidance—also highlighted as an issue by UK healthcare professionals responding to the COVID-19 pandemic.[3] This does not appear to be unique to the UK, with healthcare professionals across the globe grappling with a quagmire of fluctuating (and sometimes contradictory) mpox policies and guidance during the outbreak,[31] combined with the additional pressure of vaccine shortage and inequitable global provision.[32] Rapidly changing guidance has knock-on effects for affected communities: our previous survey of communities at risk of mpox in the UK highlighted perceptions of poor communication by health authorities and a lack of trust in the early public health response to mpox, especially among groups who already face social and structural barriers to care.[27]

Producing reliable, coordinated and consistent guidance is a common challenge in novel outbreaks where knowledge is evolving, and it takes time for consensus to emerge. However, while some examples of effective collaboration were highlighted in this study, concerns about a lack of strategic coordination nationally and conflicting messaging indicate that communication and coordination between key stakeholders must be improved to avoid repeating past mistakes. Lessons can be learnt from other countries as well as previous epidemics—a recent policy report on the UK mpox response pointed to the US government's national mpox response team as an example of strategic leadership 'between and within organisations'.[33]

Encouragingly, we found high levels of acceptability of mpox vaccination among UK sexual health professionals, which contrasts with findings among healthcare professionals in other countries.[34–37] Most respondents felt safe at work, with very few mpox acquisitions reported. This corresponds with the reported low number of cases of occupational transmission of mpox across Europe.[38] Notably, most of the respondents to this survey encountered mpox in outpatient services, where the risk of occupational infection is expected to be lower than inpatient settings.[39 40]

Finally, the high levels of stress, fatigue and anxiety reported by sexual health professionals responding to mpox are deeply concerning. This issue is endemic in the NHS more generally, with 44.8% of NHS staff reported feeling unwell due to work-related stress in 2022.[41] While COVID-19 undoubtedly created new pressures,[42] poor mental health among healthcare professionals pre-dates the pandemic and the mpox outbreak.[43] As well as being challenging for staff, this also presents economic implications for the health system (poor staff well-being has been estimated as costing the NHS £12.1 billion a year[44]) and implications for the quality and safety of patient care.[45]

The study has limitations, and our findings should be interpreted with caution. This was an exploratory study intended to provide foundational knowledge regarding the experiences of clinicians responding to a novel presentation of an unfamiliar disease. Consequently, it relied upon a convenience sample and cannot be described as representative. While demographic data for the overall sexual health and HIV workforce are not available for comparison, there were estimated to be 531 consultants working in sexual health and HIV in the UK in 2022, of whom 66.0% were female, 63% were White, and the median age group was 45–49, which broadly aligns with the demographics of our sample.[46] Using a single source of data (a survey) may have resulted in limited representation of sexual health professionals' views. A power calculation was not conducted and therefore statistical analysis was limited to describing results as the study was underpowered to explore associations between variables and potential differences between subgroups (eg, based on gender, professional role, geography, race and ethnicity). Further, those who responded to the open-text questions and provided lengthier responses were generally those with negative experiences of responding to the outbreak. More robust research is needed in future to explore inequities in sexual health professionals' experiences of the mpox outbreak and to identify protective factors which supported more positive experiences that can shape responses in the future.

CONCLUSION

With future infectious disease outbreaks an inevitability, these findings indicate that greater investment and coordination are required to ensure an effective national response and limit negative impact on healthcare professional well-being. Sexual health services need adequate funding to support outbreak preparedness, address existing epidemics and improve workforce retention. Mechanisms to improve strategic coordination and communication between key stakeholders, including representatives of clinicians and affected populations, are vital to ensure clear and consistent messaging. Finally, sustained investment in coordinated, equitable partnerships between government agencies, clinical services and communities on the ground is essential to deliver evidence-based interventions to support healthcare professional well-being, sustain patient–provider relationships and promote psychological resilience.

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Contributors RH was responsible for qualitative analysis of the open-text data, interpretation of the results, and drafting of the original manuscript and subsequent versions. FD contributed to the interpretation of the results, the drafting of the original manuscript, and with comments and input to subsequent versions. MS was responsible for the statistical analysis of the closed text data and interpretation of the results and contributed to the design of the study and with comments and input on different drafts of the manuscript. SP contributed to the qualitative analysis of the open-text data and interpretation of the results, and with comments and input on different drafts of the manuscript. VA was responsible with CMO for conceiving and designing the study, contributed to the interpretation of results, and with comments and input on different drafts of the manuscript. CD contributed to the design of the study, supported data collection, and contributed to the interpretation of the results and with comments and input on different drafts of the manuscript. LW contributed to the design of the study, supported data collection, and contributed to the interpretation of the results and with comments and input on different drafts of the manuscript. JA contributed to the design of the study, supported data collection, and contributed to the interpretation of the results and with comments and input on different drafts of the manuscript. CMO was responsible with VA for conceiving and designing the study, contributed to the interpretation of results, and with comments and input on different drafts of the manuscript. CMO is also the guarantor for the manuscript, and accepts full responsibility for the finished work and the conduct of the study, had access to the data, and controlled the decision to publish. All authors approved the final version and agreed to be accountable for all aspects of the work.

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Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by Queen Mary University of London Ethics of Research Committee (QMERC22.297). Participants gave informed consent to participate in the study before taking part.

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Data availability statement Data are available upon reasonable request. The authors commit to making the relevant anonymised participant level data available on reasonable request and following consultation with the Queen Mary University of London Ethics of Research Committee.

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	**Recommendation**	**Page No**
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	2, 5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5-6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	SAP[1]
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5, SAP[1]
Bias	9	Describe any efforts to address potential sources of bias	16
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6, SAP[1]
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	SAP[1]
		(*b*) Describe any methods used to examine subgroups and interactions	SAP[1]
		(*c*) Explain how missing data were addressed	SAP[1]
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	NA
		(*e*) Describe any sensitivity analyses	NA
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6-7
		(b) Indicate number of participants with missing data for each variable of interest	NA
Outcome data	15*	Report numbers of outcome events or summary measures	NA
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted	6-14

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[1] Available at https://osf.io/2bufh

		estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	
		(*b*) Report category boundaries when continuous variables were categorized	NA
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	14-16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	14-16
Generalisability	21	Discuss the generalisability (external validity) of the study results	14-16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.