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To cite this article: G. Ganeshan, H. Sekar, S. Reilly, C. Kuo, S. Singh, J. Michaels & W. Yoong (2024) The effect of the COVID-19 pandemic on the mental health of obstetrics and gynaecology trainees: a world-wide literature review, Journal of Obstetrics and Gynaecology, 44:1, 2319791, DOI: [10.1080/01443615.2024.2319791](https://doi.org/10.1080/01443615.2024.2319791)

To link to this article: <https://doi.org/10.1080/01443615.2024.2319791>



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Published online: 28 Feb 2024.



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REVIEW ARTICLE



The effect of the COVID-19 pandemic on the mental health of obstetrics and gynaecology trainees: a world-wide literature review

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ABSTRACT

Background: Coronavirus (COVID-19) pandemic has affected the training and wellbeing of obstetrics and gynaecology (O&G) trainees. The aim of this review is to offer a worldwide overview on its' impact on the mental health of O&G trainees, so that measures can be put into place to better support trainees during the transition back to the 'new normal'.

Methods: Key search terms used on PubMed and Google Scholar databases include: mental health, COVID-19, O&G, trainees, residents.

Results: Fifteen articles (cumulative number of respondents = 3230) were identified, of which eight employed validated questionnaires ($n = 1807$ respondents), while non-validated questionnaires were used in seven ($n = 1423$ respondents). Studies showed that COVID-19 appeared to exert more of a negative impact on females and on senior trainees' mental health, while protective factors included marriage/partner and having had children. Validated and non-validated questionnaires suggested that trainees were exposed to high levels of anxiety and depression. Their mental health was also affected by insomnia, stress, burnout and fear of passing on the virus.

Discussion: This review analyses the global impact of COVID-19 on O&G trainees' mental health, showing a pervasive negative effect linked to fear of the virus. Limited psychological support has led to prolonged issues, hindering patient safety and increasing sick leave. The study underscores the urgency of comprehensive support, particularly in female-dominated fields. Addressing these challenges is crucial for future pandemics, highlighting the need to learn from past mistakes and prioritise mental health resources for trainee well-being during and beyond pandemics.

PLAIN LANGUAGE SUMMARY

This review provides a worldwide overview of the impact Coronavirus (COVID-19) pandemic on the mental health of obstetrics and gynaecology (O&G) trainees. Fifteen articles were identified, of which eight employed validated questionnaires ($n = 1807$ respondents), while non-validated questionnaires were used in seven ($n = 1423$ respondents). The pandemic appeared to exert more of a negative impact on females and on senior trainees' mental health, while protective factors included marriage/partner and having had children. Studies suggested that trainees were exposed to high levels of anxiety and depression. Their mental health was also affected by insomnia, stress, burnout and fear of passing on the virus.

Limited psychological support has led to prolonged recovery issues and increasing sick leave. The study underscores the urgency of comprehensive support, particularly in female-dominated fields. Addressing these challenges is crucial for future pandemics, highlighting the need to learn from past mistakes and prioritise mental health resources for trainee well-being.

KEYWORDS

COVID-19; pandemic; obstetrics and gynaecology trainees; mental health; depression; anxiety

Introduction

The Coronavirus (COVID-19) pandemic presented an unprecedented challenge to public health and was declared a pandemic by the World Health Organisation (WHO) on 11 March 2020 (Riggin *et al.* 2021). Redeployment of doctors and urgent restructuring of services such as critical care, respiratory wards and emergency care in order to cope with the

acute rise in demand impacted heavily on the training and wellbeing of obstetrics and gynaecology (O&G) trainees. For example, a workforce survey conducted by the Royal College of Obstetricians and Gynaecologists (RCOG) identified that 53% of responding units had to redeploy some junior doctors while 22% has to redeploy all of their junior trainees (Relph *et al.* 2021). Almost half of the O&G trainees in a European survey had not received any specific training for treating

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COVID-positive patients – further, being placed in an unfamiliar work environment and tasked with duties outside their expertise can result in significant stress and depression symptoms (Boekhorst *et al.* 2021).

O&G trainees who were not redeployed to support COVID care had to continue providing routine obstetric cover and this translated into increased workload, longer hours and inevitably, a greater emotional toll. The elevated risk of exposure, uncertainty, fatigue, fear of contracting and spreading COVID-19, are some of the key factors which surmounted to very challenging conditions. In fact, in a major European O&G trainee survey, the United Kingdom (UK) scored the lowest on ‘safety’ measures and adequate provision of personal protective equipment (PPE) during the pandemic (Boekhorst *et al.* 2021). Unsurprisingly, all of these factors increased trainees’ vulnerability to mental health conditions such as anxiety, depression and burnout. A General Medical Council (GMC) survey identified that 23% of trainee doctors were more likely to be at moderate-to-high risk of burnout post-pandemic compared to pre-pandemic levels (Gunasekera *et al.* 2022) while the British Medical Association (BMA) found that the pandemic played a crucial role in instigating burnout, emotional distress and fatigue (Gunasekera *et al.* 2022).

The prevalence of mental health conditions in trainees is exacerbated by the altruistic expectations created within the healthcare system where healthcare professionals are encouraged to prioritise the needs of others (‘care giver’ syndrome) (Gerada 2022) allied with the stigma associated with seeking help for themselves.

In this study, we aim to offer a worldwide literature overview on the impact of the pandemic on the mental health of O&G trainees in order to gain a better understanding, so that measures can be put into place to better support trainees during the transition back to the ‘new normal’.

Methods

In this study, a thorough search was performed of primary research articles evaluating the various aspects of psychological wellbeing associated with the COVID-19 pandemic amongst O&G trainees. The search was conducted via PubMed and Google Scholar databases with the search strategy comprising three key components – mental health, O&G trainees and COVID-19 pandemic. Key search terms are listed as follows: mental health, COVID-19, O&G, trainees and residents.

Papers were considered eligible if they were published in English language peer review journals, included the use of validated and non-validated questionnaires to determine the impact on mental health and involved subjects who were specifically O&G trainees. Studies that reviewed multiple medical specialty trainees but did not include a separate analysis of O&G trainees were omitted from the data analysis.

Data points collected included source, country, study design and key findings. Quantitative data from studies where validated questionnaires were used were summarised using descriptive statistics (Table 1). Studies comprising non validated questionnaires were analysed using thematic analysis

(Table 2). Brief explanations for each type of validated questionnaires described in the studies are listed in Appendix 1.

Ethics approval

Ethics approval was not necessary as this was a review article and registration of subjects was not applicable in this review.

Results

Using our search terms, 15 articles were identified that analysed the impact of COVID-19 on O&G trainees’ mental health. Of the 15 studies (cumulative number of respondents = 3230), eight employed validated questionnaires ($n = 1807$ respondents), while non-validated questionnaires were used in seven studies ($n = 1423$ respondents). Four of the studies (Vafaei *et al.* 2020, Piccolo *et al.* 2021, Yaunin *et al.* 2021, Al Zarooni *et al.* 2023) using validated questionnaires included allied healthcare professionals and trainees from other specialties as well as O&G trainees. The countries of origin of the 15 articles are depicted in Figure 1.

Validated questionnaires

Eight studies that used validated questionnaires were identified and 11 types of validated standardised questionnaires were utilised to assess various components of mental health with the main focus on anxiety and depression. This global representation of data correlated with the wide range of validated screening tools used to assess mental health such as Global Anxiety Disorder Assessment (GAD), Depression Anxiety and Stress Scale (DASS) and Patient Health Questionnaire (PHQ). Overall, studies showed that COVID-19 appeared to exert more of a negative impact on females and on more senior trainees’ mental health, while protective factors included marriage/partner and having had children.

Anxiety

Of the validated questionnaires, anxiety was assessed in five studies, utilising GAD-7, DASS-21 and DASS-42, with the latter two screening tools incorporating ‘anxiety subscales’. Levels of clinically insignificant anxiety ranged from 31.3% (Prasad *et al.* 2021) to 85.2% (Harzif *et al.* 2022), while severe levels were reported in between 1.18% (Harzif *et al.* 2022) and 42.7% (Prasad *et al.* 2021). London trainees were three times more likely to have moderate to severe anxiety (via GAD-7) when compared to the baseline general UK population (Gunasekera *et al.* 2022). Prasad *et al.* (2021) showed that Indian trainees’ levels of clinical anxiety (using DASS 21) was 3.5 times more than other health workers while their levels of severe anxiety were the highest (severe anxiety – 42.5%, mean: 15.58) compared to the other validated studies (Yaunin *et al.* 2021, Gunasekera *et al.* 2022, Harzif *et al.* 2022, Al Zarooni *et al.* 2023). Data from O&G doctors working in the United Arab Emirates (UAE) (Al Zarooni *et al.* 2023) suggested similar findings with these respondents reporting the highest mean anxiety levels (GAD-7 mean score 20 ± 0) compared to other specialties.

Table 1. Results: studies using validated questionnaires ($n = 8$).

Author	Sample size and population	Tools used	Key findings
Gunasekera <i>et al.</i> (2022) UK	177 O&G trainees	GAD-7 PHQ-9	(1) There were three times as many trainees (20.9%) with moderate to severe anxiety compared to the UK population estimates (7%). (2) Similarly trainees were twice as likely to have moderately severe and severe depression (9%) compared to the general UK population (4%). (3) Within the study population, median GAD 7 score was 7 (mild) and the median PHQ-9 was 6 (mild).
Prasad <i>et al.</i> (2021) India	96 O&G trainees	DASS-21 Stress DASS-21 Anxiety DASS-21 Depression K-10 ISI FCV-19S	(1) O&G residents within this study demonstrated significant levels of suffering from stress (66.7%), anxiety (68.7%) and depression (61.5%). This is in stark contrast to studies conducted in other medical health workers where the prevalence of stress, anxiety and depression were 9.5%, 19.5% and 17%, respectively. (2) According to K-10, 57.3% of residents showed features of distress. (3) The ISI highlighted that 65.6% of residents suffered from insomnia. (4) On the FCV-19 scale, the mean score was 18.79 ± 6.782 suggesting residents generally had a mild to moderate level of fear from COVID-19.
Zoorob <i>et al.</i> (2021) USA	179 (all specialty trainee doctors although O&G trainee specific metrics present)	RSWBI BRS	(1) 24% of O&G residents were deemed at risk (RSBWI ≥ 5) of burnout, medical errors and suicidal ideation. O&G residents reported significantly higher RSWBI scores. (2) 8.9% of O&G residents reported low resilience scores (BRS < 3). (3) Females showed disproportionately lower scores in both tools compared to their male counterparts.
Piccolo <i>et al.</i> (2021) Italy	169* O&G HCPs (consultants, trainees, midwives grouped together)*	GHQ-12	(1) 51.5% of respondents had a GHQ-12 score of ≥ 3 (clinically significant psychological distress). (2) Females were twice more likely than men to have a GHQ-12 score of ≥ 3 .
Al Zarooni <i>et al.</i> (2023) UAE	105* (all specialty HCPs (O&G consultants & trainees grouped together)*	GAD-7 PHQ-9	(1) Compared to other specialties, O&G doctors reported the highest mean score for depression (21 ± 0) and anxiety (20 ± 0). (2) Moderate anxiety risk was mostly noted in O&G doctors (18.3%) when compared to other specialties.
Vafaei <i>et al.</i> (2020) Iran	130* O&G HCPs (trainees and Med students grouped together)*	PHQ-9 SF-36 (Mental)	(1) The mean PHQ-9 score for O&G Residents and medical students was 8.6 ± 6.8 , which was higher than that for O&G Consultants (7.4 ± 5.7). (2) Incidence of depression negatively correlated to all domains of SF-36 (Mental) – Social functioning, energy/fatigue, limitations due to emotional problems and emotional well-being.
Harzif <i>et al.</i> (2022) Indonesia	169 O&G trainees	GAD-7 PHQ-9 PCL-C-17	(1) Although the results in this study showed a lower value than previous studies, particularly in the outcome of anxiety and depression, 31.3% of participants still reported decreasing morale during the pandemic. (2) Prevalence of psychological trauma with severe symptoms was mostly found in trainees at higher level of training.
Yaunin <i>et al.</i> (2021) Indonesia	448 (all specialty doctors of which 63 were O&G)	DASS-42 Stress DASS-42 Anxiety DASS-42 Depression	(1) With regards to the various DASS-42 subscales, 16.9% had clinically significant depression, 15.6% had clinically significant anxiety and 24.4% struggled with stress.

Table 2. Results: studies using non-validated questionnaires ($n = 7$).

Author	Sample size, n (population)	Tools used	Contribution to mental health stated	Key findings
Afridi <i>et al.</i> (2023) Pakistan	98	5-Point survey Multiple choice	Yes	(1) 51% of respondents claimed a significant negative impact on mental health and 42.9% said some negative impact on mental health (2) 86.7% were most fearful of infecting their families, and this was followed closely by the fear of isolation (37.8%), fear of being socially stigmatised (11.2%) and fear of death (11.2%). (3) 78% of trainees suffered due to inadequate opportunities for elective surgeries. (4) The largest challenge reported by 85% of trainees was the inability to practice social distancing in the workplace.
Bitonti <i>et al.</i> (2020) Italy	476	45-Point survey Multiple choice	Yes	(1) 96% of respondents reported a negative impact on their mood and 84% had fears about the future. (2) More than 50% reported anxiety relating to the pandemic and 79% felt that they suffered from an irreversible training compromise.
Duggan <i>et al.</i> (2022) UK	67	36-Point survey 5-Point Likert scale Free text comments	No	(1) 60.3% of respondents reported an ongoing negative impact on their mental health.
Gothwal <i>et al.</i> (2022) India	280	Survey point not stated Multiple choice Variable Likert scales	Yes	(1) 78.9% of trainees reported anxiety due to fear of contracting virus and due to discomfort of PPE. (2) 96.1% of trainees reported fear of COVID-19 transmission to family. (3) 82.8% reported a negative impact on their mood. (4) 87.1% expressed anxiety relating to their professional futures.
Mallick <i>et al.</i> (2021) UK	87	33-Point survey 3-Point Likert scale	No	(1) 77% of respondents reported a negative impact on their wellbeing.
Bahat <i>et al.</i> (2020) Turkey	253	79-Point survey Multiple choice	Yes	(1) 78.2% of trainees felt anxious when caring for COVID-19 patients and 64.8% reporting falling into 'despair' during the pandemic. (2) 74.4% of trainees were afraid of getting sick.
Wädell <i>et al.</i> (2022) Sweden	162	28-Point survey Multiple choice	Yes	(1) 44% of respondents had either slightly or very increased stress levels during the pandemic.

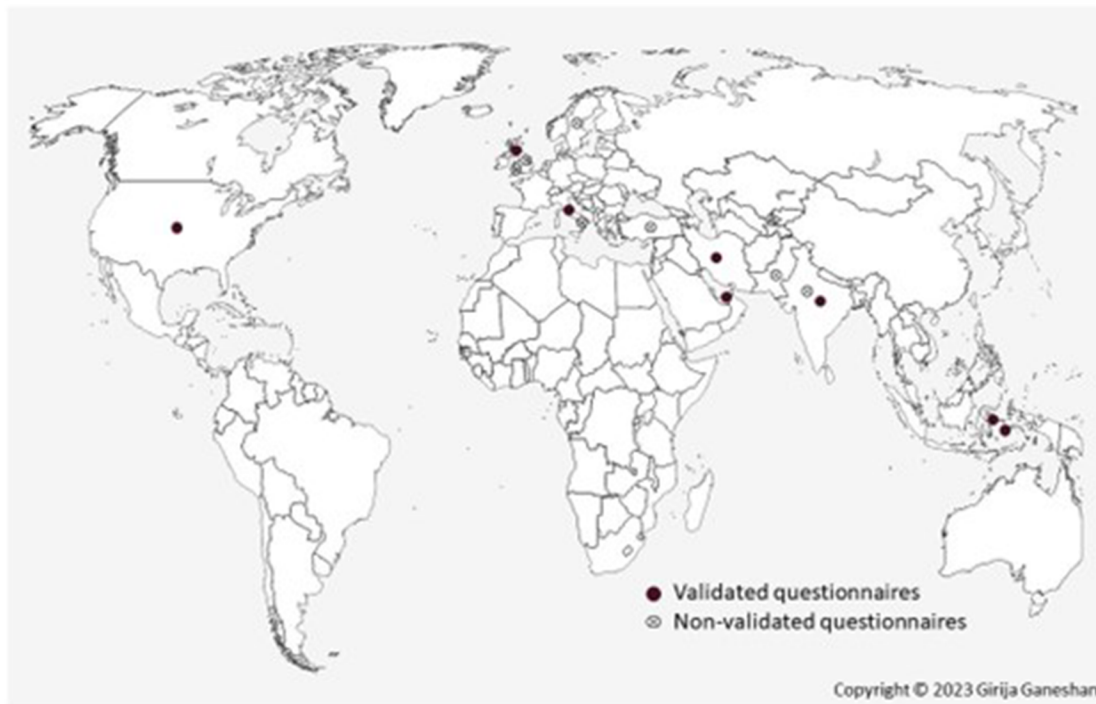


Figure 1. World map showing countries of origin of the 15 articles on COVID-19 and mental health of O&G trainees. Closed circle depict studies using validated questionnaires ($n = 8$) while crosses indicate studies using non-validated questionnaires ($n = 7$).

Conversely, the two studies from Indonesia (Yaunin *et al.* 2021, Harzif *et al.* 2022) showed lower incidences of severe anxiety (using DASS-42 and GAD-7) (severe anxiety 0.59% and 2.7%, respectively) with over 80% of participants reported minimal or normal anxiety levels.

Depression

Depression was assessed in six studies, predominantly using PHQ-9, DASS-21 and DASS-42, with the latter two screening tools including a depression subscale. In these studies, data on depression broadly mirrored trends seen with anxiety levels in GAD-7 and DASS-21 and DAS-42. Levels of 'none' to 'clinically insignificant' depression ranged from 38.5% (Prasad *et al.* 2021) to 82.8% (Yaunin *et al.* 2021), while reported levels of 'severe' depression varied from 1.18% (Harzif *et al.* 2022) to 41.7% (Prasad *et al.* 2021). London trainees were twice as likely to have moderate to severe depression in comparison to the general UK population (Gunasekera *et al.* 2022). Similarly, the prevalence of clinical depression (using DASS-21) in Indian O&G trainees was 3.6 times more than other health workers (Prasad *et al.* 2021) while their levels of severe depression were the highest (severe depression: 38.5%, mean: 16.60) amongst studies using validated questionnaires. Al Zarooni *et al.* (2023) stated that O&G trainees had the highest mean for depression (using PHQ-9; score 21 ± 0) compared to other specialty trainees within the UAE. Amongst Iranian trainees, 19.1% had moderately severe and severe depression scores (using PHQ-9) but contact with COVID positive patients did not appear to influence this (Vafaei *et al.* 2020). The prevalence of severe depression was low amongst Indonesian O&G trainees, reported as 4.2% (DASS-42) (Yaunin *et al.* 2021)

and 1.18% (Harzif *et al.* 2022), respectively, with >70% reporting normal or minimal depression levels.

Stress

Four of the eight studies included a subsection on 'stress' and authors screened respondents for: (a) levels of stress (DASS-21 and DASS-42), (b) psychological distress (K-10, GHQ-12) and (c) post-traumatic stress disorder (PTSD) (PCL-C17). Prasad *et al.* (2021) noted that O&G trainees were seven times more likely to suffer from stress compared to their counterpart health workers in India (Mathur *et al.* 2020). In addition, 37.5% of them experienced severe psychological distress and at least 57.3% experienced some level of psychological distress that was much higher when compared to international studies (Prasad *et al.* 2021). Piccolo *et al.* (2021) reported that 51.1% had experienced clinically significant psychological distress – this was twice as likely in females. Studies from Indonesia showed that 75.4% and 79.8% of their participants reported none to minimal levels of stress (Yaunin *et al.* 2021) and PTSD (Harzif *et al.* 2022), respectively.

Other factors which may affect anxiety and depression

The remaining validated questionnaires assessed other aspects that can impact and be impacted by poor mental health. These included (a) Sleep (Insomnia Severity Index), (b) Fear of COVID-19 (FCV-19S), (c) Wellbeing and Burnout (Resident/Fellow Well-Being Index), (d) Resilience (Brief Resilience Scale) and (e) Quality of life (SF-36).

These components were analysed in three articles that highlight the complex quantification of mental health: Prasad

et al. (2021) used a variety of the above scales. When assessing insomnia, it was noted that the majority of trainees experienced it to some degree (65%), with four in 10 participants experiencing moderate to severe clinical insomnia. In the same study group using FC-19S, it was noted that Indian trainees displayed a mild to moderate level of fear of the contagion. This was positively correlated with anxiety, depression, stress and insomnia. Similar results demonstrating an impact from the virus were demonstrated in the United States (Zoorob *et al.* 2021) with lower participant's wellness and resilience scores in regions with higher prevalence of COVID cases.

When reviewing risk of burnout, medical errors and suicidal ideation, Zoorob (2021) reported that nearly one quarter of O&G residents were deemed at risk. This was significantly higher when compared to other specialty residents with 8.9% of O&G residents reporting subsequent low resilience scores. Vafaei *et al.* (2020) noted that family support, friend support and social support were positively correlated with energy/fatigue and emotional wellbeing in trainees who had known positive/negative COVID-19 exposure. In addition, depression had a negative correlation with all domains of mental health.

Non-validated questionnaires

Seven studies that used non-validated questionnaires were identified from worldwide literature (Bahat *et al.* 2020, Bitonti *et al.* 2020, Mallick *et al.* 2021, Duggan *et al.* 2022, Gothwal *et al.* 2022, Wädell *et al.* 2022, Afridi *et al.* 2023). All seven focused on O&G trainees and were conducted during the time of the pandemic. Majority of the studies were from Europe ($n = 4$) but there were also authors from India ($n = 1$), Pakistan ($n = 1$) and Turkey ($n = 1$). The studies were multi-centre with data collection using on-line questionnaires sent out to participants. Surveys used a variety of Likert scales, multiple-choice and open ended questions. Questionnaire sample sizes ranged from 67 to 476. Mental health was assessed as a component of all studies and formed the main research question in only one study (Bahat *et al.* 2020).

Anxiety/depression outcomes

As studies used non-validated questionnaires, anxiety and depression diagnoses and grading of severity were not formally assessed and categorised. Terminology used to assess mental health impacts included 'negative impact', 'fears', 'stress' and 'anxiety related to the pandemic'. Only one study (Gothwal *et al.* 2022) further categorised negative effect on mood into depressive symptoms and low mood. Five of the seven studies specifically asked participants about COVID-19 and its subsequent impact on mental health. The majority of participants in the studies reported a negative impact on mood with incidence ranging from 60 to 96% (Bitonti *et al.* 2020, Duggan *et al.* 2022, Gothwal *et al.* 2022).

Continuing impact on mental health

Only Duggan *et al.* (2022) used a follow-up survey to determine the ongoing impact of the pandemic on mental health with 60% of trainees reporting a continuing negative impact.

Contributing factors to mental health

Further sub-analysis on contributing factors to the negative impact on mental health was not included in all studies. Afridi *et al.* (2023) and Gothwal (2022) reported that the main source of trainees' concerns stemmed from fear of family members being infected (86.7% and 96.1%, respectively). Bahat (2020) and Gothwal (2022) also noted that the trainees' individual fears were directly related to the virus with 74.4% and 78.9% feeling afraid of becoming sick, respectively. More than 50% of trainees' anxiety was directly linked to the pandemic (Bitonti *et al.* 2020) while 78.2% reported feelings of anxiety when caring for COVID patients (Bahat *et al.* 2020). Most of the studies (Mallick *et al.* 2021, Duggan *et al.* 2022, Wädell *et al.* 2022, Afridi *et al.* 2023) highlighted trainees' concerns with regards to the pandemic's negative impact on training and stress during redeployment. Further, trainees expressed a great degree of anxiety relating to their professional futures (Bitonti *et al.* 2020, Gothwal *et al.* 2022).

Discussion

This literature review is the first worldwide analysis focusing on the impact of COVID-19 on O&G trainees' mental health. It has highlighted the universal negative effect on psychological wellbeing that transcends country, culture and healthcare system. This long-term impact continues to still be felt and 60% of trainees in one study (Duggan *et al.* 2022) reported an ongoing negative impact on their mental health almost three years on.

Although contributing factors were not assessed in all studies, common to many of the studies, was fear of the virus itself and the impact it could have on individuals and family members. Prasad *et al.* (2021) described stress, depression and having a mental disorder being positively correlated to fear of COVID-19 and vice versa. These results were replicated in the non-validated studies in which the negative impact on wellbeing was attributed largely to fears of the virus (Bahat *et al.* 2020, Bitonti *et al.* 2020, Gothwal *et al.* 2022, Afridi *et al.* 2023). Despite the uncertainty of the virus and its trajectory being a major source of mental health problems, only a few studies referenced sources of psychological support or counselling for trainees affected during this time (Unankat and Farquhar 2020).

This paucity of resources and support for trainees was echoed in national data in the UK. In the post-pandemic 2021 GMC National Training Survey, only 52% of trainees in the high burnout risk category said they knew who to contact in their trust to discuss matters relating to occupational health and wellbeing (General Medical Council 2021). Being a traditional surgical specialty, O&G trainees tend to adopt an identity associated with imperturbable competence, stoicism and invincibility (Raiff *et al.* 2021). This inherently prevents trainees from asking for help as they fear they would be classified as 'weak' and 'vulnerable'. If support resources are not openly advertised, trainees are unlikely to seek them out (Zaman *et al.* 2022) – providing accessible and timely support structures to trainees is likely to reduce the risk of protracted burnout; while the fear of contracting COVID-19 has

significantly dissipated since the onset of the pandemic, it is apparent that the failure to provide adequate support has depleted the psychological reserves of a significant number of trainees.

Supporting staff in this way is a critical element in maintaining patient safety. Deteriorating mental health amongst trainees is likely to result in increased sick leave, staff turnover with implications for organisational costs. In fact, longitudinal analyses of data from the NHS Staff Survey in England have consistently shown associations between staff reports of stressful work environments and poorer patient satisfaction, quality of patient care and increased patient mortality (Powell *et al.* 2014).

Furthermore, 60% of the O&G workforce in the UK is female dominated (General Medical Council 2022). Studies by Piccolo *et al.* (2021) and Zoorob *et al.* (2021) reported higher levels of mental health issues in female respondents with males having higher levels of wellness. It is therefore even more pertinent that resources are available in a specialty that is not only very demanding on trainees but also has a demographic which may be more disproportionately affected by the pandemic.

Across several studies (Bitonti *et al.* 2020, Gothwal *et al.* 2022, Afridi *et al.* 2023), trainees globally expressed anxiety about their professional careers and concerns relating to irreversible training compromise during the pandemic. In contrary to popular public belief that gynaecology operating services have been restored to pre-pandemic levels, approximately 70% of respondents in the RCOG member survey indicated that they were currently operating at least part of their service at less than they were before the start of the pandemic (RCOG 2022). Training opportunities, thus, are still significantly impacted as pressures to reduce waiting lists would further reduce the training time available, as providing experience for trainees lengthens the amount of time it takes to get through surgical lists and clinics. In fact, gynaecology waiting lists across the UK have now reached a combined figure of over 570,000 women across the UK, which is just over a 60% increase on pre-pandemic levels (RCOG 2022). As indicated by Duggan (2022), building a robust gynaecological training programme supported by the RCOG framework with simulation training could be considered key to safeguarding surgical training while tackling the monumental backlog of cases.

In parallel with this, it is important to recognise the additional support that is required for trainers to support their trainees' learning needs. Twenty-five percent of secondary care trainers felt burnt out to a high or very high degree due to their work, which was an increase since pre-pandemic levels (General Medical Council 2021). Trainers are essential to providing pastoral and mentorship support to trainees and this should not go unnoticed. Trainers need to be valued and their wellbeing prioritised, otherwise, there is a risk of attrition of experienced senior doctors who can ensure that good practice is handed down to subsequent generations (General Medical Council 2021).

The COVID-19 pandemic was novel in terms of the global impact and the restrictions that were imposed by authorities which evidently continue to have profound repercussions. Additional longitudinal studies are needed to further analyse the impact of COVID-19 on the mental health of trainees in more ethnically diverse populations. Furthermore, cultural change is essential to breaking down barriers to mental

health support for trainees and most importantly, we need to learn from the past so that precautionary measures in future pandemics do not result in the same mistakes.

Disclosure statement

W. Yoong is the Deputy Editor in Chief of The Obstetrician and Gynaecologist and is a member of the RCOG Patient Safety Committee. All authors declare no conflict of interest.

Funding

The author(s) reported there is no funding associated with the work featured in this article.

Data availability statement

The authors confirm that data supporting the findings of this study are available within the article.

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Appendix 1

PHQ-9 (Nine-Item Patient Health Questionnaire). Screening and severity monitoring tool of depression. It includes nine items, each requiring four responses. Each response is scored according to the following: not at all = 0, several days = 1, more than half a day = 2 and almost every day = 3. The total depression score may range from 0 to 27. A total score of 0–4 indicates a risk of minimal depression, with a score of 5–9 signifying a mild risk of depression. A total score of 10–14 indicates a moderate risk of depression, with scores of 15–19, and 20–27, demonstrating the moderately severe and severe risk of depression, respectively.

GAD-7 (Generalised Anxiety Disorder assessment). Screening and severity monitoring tool of anxiety. Each item requires four responses, and each response is scored as follows: not at all = 0, several days = 1, more than half a day = 2 and almost every day = 3. The total Anxiety score may range from 0 to 21. A total score of 0–4 indicates a minimal risk of anxiety, with a total score of 5–9 demonstrating a mild risk of anxiety. Total scores of 10–14, and 15–21 indicate moderate and severe risk of anxiety, respectively.

MSPSS (Multidimensional Scale of Perceived Social Support). To assess the sufficiency of each participant's social support. This questionnaire contained 12 items scored from 1 (very strongly disagree) to 7 (very strongly agree). These items evaluated family, friends and other types of social support. A total final score from 1 to 2.9, from 3 to 5, or from 5.1

to 7 was considered as a low, moderate or high level of perceived social support, respectively.

SF-36 (Short Form-36). Evaluation of quality of life. This survey had 36 items for evaluating the status of the two main aspects of physical and mental health. The main aspect of physical health had four subgroups, i.e. physical functioning, pain, general health and limitations due to physical health, and limitations due to emotional problems, emotional well-being, social functioning and energy/fatigue were the subgroups included in the mental health aspect of quality of life. The parts assessing physical and mental health were scored separately from 0 to 100. Lower scores indicated severe impairment and higher scores represented better functions in each item.

Brief-COPE. Evaluation of coping strategies. It is composed of 28 items describing different coping strategies self-evaluated by respondents on a four-point Likert scale ranging from 1 ('not doing it at all') to 4 ('doing it a lot'). The coping strategies were grouped into emotions-focused, problems-focused and dysfunctional coping strategies.

GHQ-12 (Generalised Health Questionnaire-12). Screening tool for non-psychotic psychological distress. The questionnaire includes 12 items at a four-level scale scored as 0, 0, 1 and 1. A GHQ-12 score ≥ 3 was considered positive for the presence of clinically significant psychological distress.

PCL-C17 (PTSD CheckList-Civilian Version). Standardised self-report rating scale for PTSD comprising 17 items that correspond to the key symptoms of PTSD. It is calculated by assigning score of 1, 2, 3, 4 and 5. The total range will score between 17 and 85. Cut off points of 17–29, 30–44 and 45–85 were interpreted as little to no severity, moderate severity and high severity.

RSWBI (Resident/Fellow Well-Being Index). It is a seven-question tool that asks about feelings of burnout, symptoms of depression, and signs of fatigue to determine the level of wellness of each resident and/or fellow. The scores range from 0 to 7, with higher scores having poorer wellness. A score of 2.64 is the average, based on a national survey in the US, with a standard error of 0.02. RSWBI scores of 5 or more are considered 'at risk' as they have a higher incidence of burnout, medical errors and suicidal ideation.

BRS (Brief Resilience Scale). It is a six-question tool that measures a person's resilience, which is the ability to recover from stress. The score can range from 1 to 5, with 3.70 being the average with a standard deviation of 0.68. It has good internal consistency and test-retest reliability. Resilience scores less than 3.00 suggest low resilience while those above 4.30 suggest high resilience.

DASS-42 (Depression, Anxiety and Stress Scale-Long Form). Assesses severity of the core symptoms of depression, anxiety and stress using a 42 item self-reporting scale divided into these three categories. Each question is scored ranging from 0 to 3 with 0 = none/never, 1 = sometimes, 2 = often and 3 = almost every time. Scores from each category are added up to give an overall score relating to normal, mild-moderate or severe-crushing levels.

K-10 (Kessler Psychological Distress Scale). Simple measuring tool of psychological distress. The scale involves 10 questions about emotional states each with a five-level response scale. The measure can be used as a brief screen to identify the level of distress. Each item is scored from 1 (none of the time) to 5 (all of the time) and scores of 10 items are then summed, yielding a minimum score of 10 and a maximum score of 50. Low scores indicate low levels of psychological distress and a high score indicates high levels of psychological distress.

ISI (Insomnia Severity Index). This is a seven-item self-report questionnaire assessing the nature, severity and impact of insomnia. The usual recall period is the last month. A five-point Likert scale is used to rate each item (0 – no problem to 4 – very severe problem), yielding a total score ranging from 0 to 28. The score is interpreted as follows absence of insomnia (0–7), sub-threshold insomnia (8–14), moderate insomnia (15–21) and severe insomnia (22–28).

DASS-21 (Depression, Anxiety and Stress Scale-21 items). This is a shorter version of the above mentioned DASS-42 questionnaire. The DASS-21 has 21 items in three subscales of seven items each. They ask about depressive, anxiety and general stress symptoms. Response options are on a four-point Likert scale (0 – did not apply to me at all to 3 – applied to me very much). Higher scores indicate higher psychological distress.