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# Generalized anxiety disorder and major depressive disorder among healthcare professionals in Mbarara city, southwestern Uganda: the relationship with professional quality of life and resilience

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## Abstract

**Background** Marking the lives of healthcare professionals (HCPs) are tensions arising from the conflict between fulfilling their duty of care and the demands of the healthcare setting, creating concern for HCPs' mental. In our study, we aim to determine the prevalence of major depressive disorder (MDD) and generalized anxiety disorder (GAD) among HCPs in Southwestern Uganda and to establish how the disorders' prevalence affects professional quality of life and resilience.

**Method** In total, 200 HCPs from two health facilities (one private and one public) in Southwestern Uganda enrolled in an analytical cross-sectional study. We used the Patient Health Questionnaire-9 (PHQ-9) to determine MDD, the Generalized Anxiety Disorder-7 (GAD-7) to determine GAD, the Professional Quality of Life Scale-5 (ProQOL-5) to determine professional quality of life and the Nicholson McBride Resilience Questionnaire (NMRQ) to determine resilience.

**Results** The prevalence of MDD was 11.0% and of GAD was 14.5%. High compassion fatigue increased the likelihood of MDD [aPR = 3.38, *p* value < 0.001]. However, high compassion satisfaction and exceptional resilience reduced the likelihood of GAD i.e., [aPR = 0.50, *p* value < 0.001] and [aPR = 0.50, *p* value < 0.001] respectively. Being male [aPR = 2.41, *p* value = 0.005] and being married [aPR = 1.79, *p* value = 0.017] increased the likelihood of having MDD. The likelihood of GAD among HCPs decreased with age, [aPR = 0.97, *p* value = 0.022].

**Conclusion** There is a significant occurrence of MDD and GAD among healthcare professionals (HCPs) in Southwestern Uganda. Compassion fatigue is linked to an elevated prevalence of MDD, while compassion satisfaction and high resilience scores are associated with a reduced prevalence of GAD. We recommend creation and execution of extensive mental health initiatives designed for HCPs.

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**Keywords** Generalized anxiety disorder, GAD, Major depressive disorder, MDD, Healthcare professionals, HCPs, Professional quality of life and resilience

## Introduction

Providing healthcare is a demanding and multifaceted endeavor [1, 2]. Healthcare professionals (HCPs) encounter a wide range of challenges, even outside of the clinical context, including poor renumeration, increased workload, work-life balance issues, resource shortages, ethical dilemmas, and limited access to training, especially in low-resource settings like Uganda [1, 2] such as administrative burdens, work-life balance, resource limitations, ethical dilemmas, and legal pressures inadequate staffing, lack of essential supplies, or limited access to specialized training, particularly in low-resource settings like Uganda. As a result, the professional lives of HCPs are marked by tensions arising from the natural conflict between their duty of care and demanding healthcare settings [3]. This makes the HCPs' mental health an issue of immense concern. Researchers have found high prevalence of mental disorders among HCPs working across different jurisdictions [4–10], with the most common being Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD) [4, 9, 11]. MDD is associated with functional impairment and suicide risk [12], while GAD is characterized by feelings of tension, recurrent intrusive worries and thoughts, and physical changes, such as increased blood pressure [9, 13, 14].

Diverse factors are linked to the increase in the prevalence of these disorders among HCPs; such as a high workload, impacts of family life, workplace pressures, patient complaints (and those of patients' family members), poor management styles, inadequate resources, inadequate training, low involvement in decision-making, low job satisfaction, and workplace harassment [2, 15–17]. As HCPs navigate long work hours, high stakes decision-making, and emotional intensity, there is often delicate balance between dedication to patient welfare and personal well-being becomes increasingly difficult to maintain [17, 18]. Balance is further disrupted by the complex interplay between mental health challenges, resilience, and professional quality of life (ProQOL), with no provisions for HCP mental well-being [17, 19, 20]. As a result, many resort to substance use to cope with these pressures [21].

Professional quality of life of HCPs refers to the overall sense of satisfaction and fulfillment they experience in connection with their role as helpers in their professional work [22, 23]. Both the positive and negative aspects of doing one's job influence one's professional quality of life [22]. A positive professional quality of life, defined by a sense of achievement, job contentment, and a clear sense of purpose, can positively impact mental health [20]. Those who derive meaning and satisfaction from their work are more likely to enjoy enhanced mental well-being [20]. Conversely, a negative professional quality of life, characterized by heightened stress, burnout, and compassion fatigue, may contribute to difficulties in mental health [20]. Resilience in HCPs refers to their capacity to adjust, recover, and sustain their well-being when confronted with challenges, stress, and adversity in the healthcare setting [24]. Resilience encompasses emotional and psychological fortitude, efficient coping strategies, and the ability to overcome setbacks or challenging circumstances [24]. HCPs possessing elevated levels of resilience are more adept at handling the stressors and challenges frequently encountered in their demanding positions, thereby promoting their mental well-being [25].

To create focused interventions intended to promote resilience and improve HCP well-being, we must comprehend the complex interaction between mental disorders (e.g., GAD and MDD) and the professional environment of healthcare. Our goal is to illuminate these relationships to offer knowledge that may guide organizational support structures, individual coping mechanisms, and policy decisions—all contributing to the development of a more robust and healthy healthcare workforce. The study, therefore, aimed to determine the prevalence of MDD, GAD among HCPs in southwestern Uganda and to establish the relationship between MDD and GAD with ProQOL and resilience.

## Methods

### Study area and design

We conducted an analytical cross-sectional study among HCPs at Mbarara Regional Referral hospital (MRRH) and Divine Mercy Hospital; in Mbarara city in southwestern Uganda between October-November, 2023. MRRH is a public regional referral hospital for the western region, serving multiple districts of Mbarara, Bushenyi, Ntungamo, Kiruhura, Ibanda, and Isingiro, Buhweju, Mitooma, Rubirizi, Sheema, Lyantonde, Rakai, Kabale, Kabarole, Kamwenge and neighboring countries of Burundi, Rwanda, Democratic Republic of Congo (DRC), and Tanzania [26, 27]. MRRH has a bed capacity of 350 beds, and offer general consultation management along with various special units for Internal medicine, Pediatrics, Surgery, Obstetrics and Gynecology, Ear Nose and Throat (ENT), Ophthalmology, Neurology, Physiotherapy, Oncology and Psychiatry. MRRH doubles as a teaching hospital for Mbarara University of Science and Technology. Divine Mercy Hospital is a private hospital

that offers specialist consultation in Obstetrics and gynecology, Internal Medicine, Pediatrics and Surgery [28].

#### Inclusion and exclusion criteria

Participants were nurses, midwives, medical doctors, clinical officers (a clinical associate holding a diploma in clinical medicine who play a crucial role in healthcare, especially in settings where there may be a shortage of fully qualified medical doctors) and laboratory technicians. These individuals are usually the first line of contact for general patients. We excluded HCPs who were on leave from work at the time of data collection.

#### Data collection and quality control

Four research assistants, each trained in data collection, research ethics, administration of questionnaires, and crafting tactful questions, collected the data. Eligible participants were identified and approached either in their offices or during unit/clinical meetings. All eligible HCPs were invited to participate, and those who provided consent were included were informed about the purpose of the study. After receiving their consent to participate, respondents were provided the questionnaire, which was to be completed during break, post shift, or at a convenient time; always prioritizing patient care over the survey's completion. At the time of the study, MRRH employed approximately 358 (HCPs), while Divine Mercy Hospital had about 45. Of the 200 participants who consented and fully completed the questionnaire, 79.5% (159 participants) were from MRRH, resulting in a response rate of 44.4%. The remaining 20.5% (41 participants) were from Divine Mercy Hospital, yielding a response rate of 91.1%. Overall, the combined response rate for the two hospitals was 49.6%.

#### Study tools and measures

The survey was composed of validated self-report scales measuring mental disorder prevalence, specifically generalized anxiety disorder and major depressive disorder. The survey also asked for socio-demographic information, including: age, sex, marital status, profession, hospital of work. Specifically, we assessed resilience using the Nicholson McBride Resilience Questionnaire (NMRQ) [29], professional quality of life using the Professional Quality of Life Scale-5 (ProQOL-5) [30], MDD using the Patient Health Questionnaire-9 (PHQ-9) [31], and GAD using the Generalized Anxiety Disorder-7 (GAD-7) [32].

##### *Study tools*

**The patient health questionnaire-9 (PHQ-9)** The PHQ-9 is a self-report tool that measures symptoms of depression. The scale is composed of nine items, with response items on a 4-point Likert scale that ranges from "not at all" (zero) to "nearly every day" (3). Items include, for example, "Little interest or pleasure in doing things" and "Difficulty focusing on things". Participants' responses are summed to create total scores ranging from 0 to 27. MDD is considered when the score total is of 10 or more and a score of 2 or more to either Question #1 or #2). We elected to use the PHQ due to excellent psychometric properties in African countries [33, 34] and a Cronbach alpha of 0.89.

**The generalized anxiety disorder-7 (GAD-7)** We used the GAD-7, a seven-item self-report scale to assess prevalence of GAD during the previous two weeks [35]. The scale inquires about being bothered by tense feelings or of being nervous or on edge and not knowing how to stop or control worrying, for example. Scores are displayed on a range of 0 to 21, with cut-off marks for mild, moderate, and severe anxiety at 5, 10, and 15, respectively. A suggested cut-off point for referral for additional assessment when screening for GAD is 10 or higher [36]. For our study the Cronbach alpha was 0.91.

**The professional quality of life scale-5 (ProQOL-5)** The ProQOL-5 measures the benefits and drawbacks of working with individuals who have endured severely stressful situations. The ProQOL-5 targets people in helping or caring professions and consists of 30 measures [30]. Three ProQOL subscales assess burnout, compassion satisfaction, and compassion fatigue, resulting in three distinct scores. Generally, a respondent is more likely to experience compassion fatigue if they score higher on the Compassion Fatigue subscale. Increased scores on the subscale measuring burnout suggests the respondent is susceptible to burnout symptoms (e.g., powerlessness and hopelessness) [30]. Higher scores on the Compassion Satisfaction subscale indicate the respondent is more satisfied with their ability to provide care (e.g., caregiving is an energy-enhancing experience, increased self-efficacy). The expected highest median score of 25 groups the participants into low versus high on the individual subscales. Our Cronbach alpha reliabilities for the scale structure was 0.65 for the Burnout scale, 0.77 for Compassion Fatigue, and 0.84 for Compassion Satisfaction.

**The Nicholson McBride resilience questionnaire (NMRQ)** We measured resilience using an abbreviated version of the NMRQ [29]. Each of the 12 items can be scored between 1 (strong disagreement) and 5 (strong agreement). A score between 0 and 37 indicated a developing level of resilience; 38–43 an established level of resilience; 44–48 a strong level of resilience; and 49–60 an extraordinary level of resilience. The NRMQ is internally reliable in a range of topic areas, particularly in Africa [37]. Our cronbach alpha was 0.83.

### Ethics

The Uganda National Council for Science and Technology (HS3037ES) and the research ethics committees of Mbarara University of Science and Technology (MUST-2023-779) provided ethical approvals and we followed the Declaration of Helsinki 2013 criteria. Hospital directors further provided administrative clearance for the study and each respondent provided written informed consent prior to completing the survey.

### Data analysis

We analyzed data using STATA version 15.0 (Stata Corp LLC, College Station, Texas, USA). Continuous and categorical variables were summarized, providing descriptive statistics. We accounted for clustering by hospital type; used Modified Poisson regression to analyze the association between MDD and GAD and professional quality of life. Following the bivariate analysis, age and gender were adjusted for in the multivariable analysis, which was performed using the stepwise backward approach. All variables with *p*-values less than 0.2 from the bivariate analysis were included in the multivariable model. We did the likelihood ratio test to assess interaction, also assessed confounding variables; deeming variables with a percentage change of more than 10% confounding. We used a 0.05 significance level.

## Results

In total, 200 HCPs participated in the survey. There was no statistical difference in the distribution of the participants' social demographic characteristics across MDD or GAD (see Table 1). Of the 200 HCPs, 97.5% ($n=193$) had high compassion satisfaction, 49.3% ($n=98$) had high compassion fatigue, and 37.9% ($n=75$) had high levels of burnout (see Table 2).

### Prevalence of major depressive disorder (MDD) and general anxiety disorder (GAD)

The prevalence of MDD was 11.0% ($n=22$), with a 95% Confidence interval (CI) of 7 – 16%. The prevalence of GAD was 14.5% ($n=29$), with a 95% Confidence interval (CI) of 10.2 – 20.1%. Nurses/midwives had the highest prevalence of MDD (59.1%) and GAD (44.8%), with medical doctors reporting 22.7% for MDD and 41.4% for GAD. Clinical officers and laboratory technicians showed lower rates of both disorders, although these differences were not statistically significant. (see Table 1).

### Distribution of MDD and GAD across professional quality of life and resilience

MDD was statistically more prevalent among those with high compassion fatigue (72.3% vs. 27.3%, $X^2=5.45$, $p$ value = 0.019). However, there was no statistical difference in GAD across resilience and professional quality of life measures (see Table 2).

### Relationship between MDD and professional quality of life

The likelihood of MDD among HCPs increased with having high compassion fatigue [aPR = 3.38, CI = 2.56–4.46, $p$ value < 0.001] (Table 3).

### Other factors associated with MDD

Being male [adjusted prevalence ratio (aPR) = 2.41, CI = 1.31–4.43, $p$ value = 0.005] and being married [aPR = 1.79, CI = 1.11–2.90, $p$ value = 0.017] increased the likelihood of MDD among HCPs (Table 3).

**Table 1** Participant socio-demographic characteristics distribution across presence of MDD or GAD

| Variable | MDD | | $X^2$ (*p*-value) | GAD | | $X^2$ (*p*-value) |
|---|---|---|---|---|---|---|
| | No *n* (%) 178 (89.0) | Yes *n* (%) 22 (11.0) | | No *n* (%) 171 (85.5) | Yes *n* (%) 29 (14.5) | |
| **Age (mean, *SD*)** | 31.9, 7.0 | 33.4, 7.0 | 0.368 | 32.2, 7.3 | 31.2, 5.4 | 0.501 |
| **Health profession** | | | | | | |
| Clinical officers | 8 (4.5) | 1 (4.5) | 1.96 (0.581) | 8 (4.6) | 1 (3.5) | 1.47 (0.688) |
| Laboratory technicians | 13 (7.3) | 3 (13.6) | | 13 (7.6) | 3 (10.3) | |
| Medical doctors | 62 (34.8) | 5 (22.7) | | 55 (32.2) | 12 (41.4) | |
| Nurses/midwives | 95 (53.4) | 13 (59.1) | | 95 (55.6) | 13 (44.8) | |
| **Gender** | | | | | | |
| Female | 102 (57.3) | 10 (45.5) | 1.11 (0.291) | 71 (41.5) | 17 (58.6) | 2.94 (0.086) |
| Male | 76 (42.7) | 12 (54.5) | | 100 (58.5) | 12 (41.4) | |
| **Marital status** | | | | | | |
| Single | 88 (49.4) | 8 (36.4) | 1.34 (0.257) | 81 (47.4) | 15 (51.7) | 0.19 (0.664) |
| Married | 90 (50.6) | 14 (63.6) | | 90 (52.6) | 14 (48.3) | |
| **Hospital type** | | | | | | |
| Private | 33 (16.0) | 8 (36.4) | 1.34 (0.247) | 34 (19.9) | 7 (24.1) | 0.275 (0.600) |
| Public | 145 (84.0) | 14 (63.6) | | 137 (80.1) | 22 (75.9) | |

**Table 2** Resilience and professional quality of life across MDD and GAD

| Variable | All participants *n* (%) | MDD | $X^2$ (*p*-value) | GAD | $X^2$ (*p*-value) |
|---|---|---|---|---|---|
| | | Yes | | Yes | |
| **Resilience** | | | | | |
| Developing | 23 (11.5) | 2 (9.1) | 1.55 (0.671) | 6 (20.7) | 3.33 (0.343) |
| Established | 44 (22.0) | 3 (13.6) | | 7 (24.1) | |
| Strong | 69 (34.5) | 8 (36.4) | | 9 (31.3) | |
| Exceptional | 64 (32.0) | 9 (40.9) | | 7 (24.1) | |
| ***Professional quality of life*** | | | | | |
| **Compassion satisfaction** | | | | | |
| Low | 5 (2.5) | 1 (4.5) | 0.41 (0.522) | 2 (6.9) | 2.63 (0.104) |
| High | 193 (97.5) | 21 (95.5) | | 27 (93.1) | |
| **Compassion fatigue** | | | | | |
| Low | 101 (50.7) | 6 (27.3) | **5.45 (0.019)** | 13 (44.8) | 0.47 (0.490) |
| High | 98 (49.3) | 16 (72.7) | | 16 (55.2) | |
| **Burn out** | | | | | |
| Low | 123 (62.1) | 12 (54.5) | 0.60 (0.437) | 15 (51.7) | 1.56 (0.212) |
| High | 75 37.9) | 10 (45.5) | | 14 (48.3) | |

**Table 3** Regression analysis for factors associated with MDD

| Variable | Bi variable analysis | | Multivariable analysis | |
|---|---|---|---|---|
| | Crude Prevalence ratio (95% confidence interval) | *p*-value | Adjusted Prevalence ratio (95% confidence interval) | *P*-value |
| **Age** | 1.02 (1.00–1.05) | 0.052 | 1.01 (1.00–1.03) | 0.213 |
| **Gender** | | | | |
| Female | 1 (reference) | | 1 (reference) | |
| Male | 1.53 (1.06–2.20) | 0.023 | 2.41 (1.31–4.43) | **0.005** |
| **Marital status** | | | | |
| Single | 1 (reference) | | 1 (reference) | |
| Married | 1.62 (1.11–2.34) | 0.011 | 1.79 (1.11–2.90) | **0.017** |
| **Health profession** | | | | |
| Clinical officer | 1 (reference) | | 1 (reference) | |
| Lab technician | 1.69 (0.57–5.01) | 0.346 | 1.67 (0.47–5.94) | 0.429 |
| Medical doctor | 0.67 (0.55–0.82) | < 0.001 | 0.67 (0.41–1.09) | 0.106 |
| Nurse/midwife | 1.08 (0.58–2.02) | 0.802 | 1.33 (0.29–6.14) | 0.716 |
| **Resilience** | | | | |
| Developing | 1 (reference) | | - | |
| Established | 0.78 (0.11–5.74) | 0.811 | | |
| Strong | 1.33 (0.59–2.99) | 0.486 | | |
| Exceptional | 1.62 (0.49–5.35) | 0.431 | - | |
| **Compassion satisfaction** | | | | |
| Low | 1 (reference) | | 1 (reference) | |
| High | 0.54 (0.41–0.73) | < 0.001 | 0.74 (0.45–1.22) | 0.239 |
| **Compassion fatigue** | | | | |
| Low | 1 (reference) | | 1 (reference) | |
| High | 2.75 (1.85–4.06) | < 0.001 | 3.38 (2.56–4.46) | **< 0.001** |
| **Burn out** | | | | |
| Low | 1 (reference) | | - | |
| High | 1.37 (0.81–2.31) | 0.242 | - | |

### Relationships between GAD and professional quality of life or resilience

Having high compassion satisfaction [aPR = 0.50, CI = 0.38–0.65, *p* value < 0.001] and exceptional resilience [aPR = 0.50, CI = 0.43–0.58, *p* value < 0.001] reduced the likelihood of having GAD (Table 4).

### Other factors associated with GAD

The prevalence of GAD among HCPs decreased with age, explicitly younger HCPs were more likely to have GAD [aPR = 0.97, 95% confidence interval (CI) = 0.94–0.99, *p* value = 0.022]– (Table 4).

**Table 4** Regression analysis for factors associated with GAD

| Variable | Bi variable analysis | | Multivariable analysis | |
|---|---|---|---|---|
| | Crude Prevalence ratio (95% confidence interval) | *p*-value | Adjusted Prevalence ratio (95% confidence interval) | *P*-value |
| **Age** | 0.98 (0.96–1.01) | 1.148 | 0.97 (0.94–0.99) | **0.022** |
| **Gender** | | | | |
| Male | 1 (reference) | | 1 (reference) | |
| Female | 0.55 (0.30–1.02) | 0.059 | 0.52 (0.18–1.46) | 0.213 |
| **Marital status** | | | | |
| Single | 1 (reference) | | 1 (reference) | |
| Married | 0.86 (0.81–0.91) | < 0.001 | 1.24 (0.87–1.77) | 0.243 |
| **Health profession** | | | | |
| Clinical officer | 1 (reference) | | 1 (reference) | |
| Lab technician | 1.69 (0.57–5.01) | 0.346 | 1.27 (0.36–4.50) | 0.704 |
| Medical doctor | 1.61 (0.95–2.73) | 0.076 | 1.11 (0.59–2.09) | 0.736 |
| Nurse/midwife | 1.08 (0.58–2.02) | 0.802 | 1.07 (0.71–1.64) | 0.723 |
| **Resilience** | | | | |
| Developing | 1 (reference) | | 1 (reference) | |
| Established | 0.61 (0.31–1.21) | 0.157 | 0.82 (0.29–2.32) | 0.713 |
| Strong | 0.50 (0.41–1.76) | 0.281 | 0.63 (0.18–2.18) | 0.462 |
| Exceptional | 0.41 (0.39–0.45) | < 0.001 | 0.50 (0.43–0.58) | **< 0.001** |
| **Compassion satisfaction** | | | | |
| Low | 1 (reference) | | 1 (reference) | |
| High | 0.35 (0.29–0.42) | < 0.001 | 0.50 (0.38–0.65) | **< 0.001** |
| **Compassion fatigue** | | | | |
| Low | 1 (reference) | | 1 (reference) | |
| High | 1.27 (1.25–1.28) | < 0.001 | 1.05 (0.70–1.60) | 0.808 |
| **Burn out** | | | | |
| Low | 1 (reference) | | 1 (reference) | |
| High | 1.53 (0.86–2.71) | 0.143 | 1.29 (0.57–2.93) | 0.547 |

## Discussion

This study investigated the prevalence of MDD and GAD among healthcare professionals HCPs in Mbarara city in southwestern Uganda, and explored the associations between GAD and MDD with ProQOL and resilience. The prevalence of MDD and GAD was high. A positive screen for high compassion fatigue was associated with an increased prevalence of MDD. However, high compassion satisfaction and high resilience scores decreased the prevalence of GAD. Males and married HCPs were more likely to have MDD, but increased age was associated with a decrease in GAD prevalence.

The high prevalence of MDD in this study was similar to that of 12% reported among HCPs in USA [38]. However it was much higher than the 1% reported among Italian nurses attending to Alzheimer's disease patients [10], and higher than the 6.7% reported among health care workers in Saudi Arabia [39]. The higher prevalence in this study is likely due to differences in study settings and populations. In this study, healthcare professionals operated in a resource-limited environment, facing considerable stressors like limited mental health support, inadequate staffing, and heavy workloads [40]. These challenges, coupled with socio-cultural factors specific to Uganda—such as mental health stigma, cultural expectations of resilience, healthcare system limitations, and socio-economic difficulties [40]—may lead to higher levels of stress and mental health issues compared to more resource-rich settings with better support systems, like those in the USA, Italy, and Saudi Arabia.

The 14.5% prevalence of GAD in our study is lower than the 20% reported for emergency HCPs in Saudi-Arabia [9] and similar to the 15% reported among HCPs in India [9]. However, the GAD prevalence was much lower than the 25.6–35.4% reported in a systematic review of papers during COVID-19 [8], likely because this study was not conducted during a crisis. The higher prevalence during the COVID-19 pandemic is attributed to the stress of the pandemic response. In Ethiopia, however, GAD prevalence was only 6.3% among HCPs during the early waves COVID-19. Moreover, GAD prevalence may have intensified as the pandemic progressed for HCPs. Nevertheless, the consistent finding remains that GAD is prevalent among HCP, thus communities, healthcare organizations, and legislators must work together to recognize and support the mental health of HCPs, particularly in times of crisis.

The finding that having high compassion fatigue is associated with an increased likelihood of having MDD among HCPs emphasizes the intricate relationship

between severe mental health outcomes and the physical, emotional, and psychological effects of serving others. Compassion fatigue may result from the emotional strain of providing care, particularly in high-stress and emotionally charged circumstances [19]. High compassion fatigue may therefore increase the risk of mental disorders, such as MDD [19]. The emotionally taxing nature of the healthcare industry, coupled with long hours and a high patient load, can have an adverse effect on mental health outcomes [2, 15–17, 19]. Recognizing and addressing compassion fatigue early on, may serve as a preventive measure for more severe mental health conditions [19], which may be negated by regular mental health check-ins, counseling services, and education programs to strengthen HCPs' resilience and coping skills.

High compassion satisfaction was associated with a reduced prevalence of GAD, which aligns with research revealing the positive effects of job satisfaction, fulfillment, and positive work environments on HCPs' mental health [41, 42]. HCPs reporting higher levels of compassion satisfaction may be more resilient to stress and less prone to developing GAD [43]. More resilient individuals are better able to handle stress and less prone to developing GAD [44, 45]. This explains why extraordinary resilience was a protective factor against GAD. Thus, compassion satisfaction and resilience may work in concert to lower the risk for GAD, as resilience can enhance an individual's capacity to navigate challenges, while compassion satisfaction provides positive emotional rewards derived from helping others [45, 46]. Recognizing and fostering resilience and compassion satisfaction may be integral components of strategies for promoting mental well-being in the healthcare workforce [47].

We found that male HCPs had a higher prevalence of MDD, which counters findings where MDD is more prevalent among females [48, 49]. Why MDD was more prevalent among male HCPs is unclear, as all sexes are affected by the demanding nature of healthcare professions, which are marked by rigorous schedules, exposure to trauma, and vast responsibilities—all contributors to MDD [4, 11]. However, perhaps because men, in general, may be less inclined to seeking healthcare [50, 51], they may be more likely to experience MDD versus symptoms of depression that would be easier to treat. Male HCPs (less prone to seeking assistance for their mental health concerns), may face heightened vulnerability to the adverse effects of occupational stress, potentially increasing the prevalence of MDD. Moreover, the intersection of cultural elements, such as cultural expectations, limited social support systems, and distinct challenges encountered by males in African countries, e.g., traditional expectation of stoicism and emotional restraint placed on men [52], could be influencing the identified association [53]. Our finding underscores the importance of tailored mental health awareness initiatives and support programs designed to address gender-specific obstacles, such as workshops on Emotional Well-being of men, public awareness campaigns seeking help for mental health issues among men and peer Support programs where men can support one another. Warranted are efforts directed toward destigmatizing mental health concerns and encouraging help-seeking behaviors, particularly among male HCPs. All areas necessitate further research, including qualitative studies to provide context around the statistics, which in turn can guide interventions aimed at addressing mental health difficulties among male HCPs.

How being married is associated with a higher prevalence of MDD among HCPs, counters prior research showing marriage has mental health benefits tied to provision of emotional support and companionship [54, 55]. The demands of healthcare occupations, including extended work hours and exposure to challenging situations, may intersect with family demands, thus negatively affecting mental health [6, 56]. Married HCPs may encounter challenges in achieving a harmonious work-life balance, particularly when stressors from work spill over into their personal lives [57, 58]. Moreover, expectations linked to both their professional responsibilities as HCPs and their roles as spouses may generate role strain [58]. Juggling the demands of the profession and familial obligations and expectations can contribute to heightened stress and, in consequence, MDD [58]. Furthermore, stigma associated with mental health, arguably rather intense in Uganda, may hinder help-seeking behaviors as married HCPs may fear judgment within their family unit, increasing prevalence of MDD [59].

Increased age is associated with a lower prevalence of GAD among HCPs, which aligns with broader trends observed in mental health research [60–62]. As individuals age, they often develop greater emotional maturity, improved coping skills, increased psychological resilience and career stability [63]. Accumulated professional and life experiences may lead to a better perspective on challenges and a more adaptive response to stress, all protective factors potentially contributing to reduced vulnerability to GAD among HCPs.

#### Implications for clinical care and policy

The considerable prevalence of MDD and GAD among HCPs in southwestern Uganda underscores the critical necessity for targeted mental health interventions and support within the healthcare sector. The link between compassion fatigue and an elevated occurrence of MDD emphasizes the profound impact of delivering care in challenging circumstances on mental health. Advocating for early recognition and proactive management of compassion fatigue is crucial as a preventive measure

for severe mental health conditions, with regular mental health check-ins, counseling services, and educational programs enhancing HCPs' resilience and coping skills.

Acknowledging and nurturing resilience, in conjunction with compassion satisfaction, should be pivotal elements in strategies aimed at fostering mental well-being among healthcare professionals, thereby contributing to a more resilient response to stressors. The heightened prevalence of MDD among male HCPs underscores the imperative for gender-specific mental health initiatives, especially tailored to address the reluctance of males to seek healthcare. Recommending customized awareness programs, public campaigns, and peer support initiatives for male HCPs becomes essential to tackle cultural expectations and limited social support systems.

Collaboration among policymakers, healthcare organizations, and communities is vital to acknowledge and support the mental health of HCPs. Tailored mental health awareness initiatives, support programs, and interventions need to be devised, taking into account gender-specific challenges, cultural expectations, and the distinct demands of healthcare professions. Additionally, further research, including qualitative studies, is warranted to offer contextual insights that can inform effective interventions targeting mental health challenges among male HCPs.

### Study limitations

The present study has some limitations. Firstly, we employed a cross-sectional design, making it challenging to establish a causal relationship between changes in MDD, GAD, and other factors. Consequently, it is advisable to conduct larger and more comprehensive prospective studies. Secondly, the sample of health professionals may not be fully representative of the broader experiences of health professionals in the country, as participants were drawn from two health facilities within one region with low response rates. Moreover, the assessment tools used to measure MDD, GAD, resilience, and professional quality of life have not been validated for applicability in the Ugandan context.

## Conclusion

There is a high prevalence of MDD and GAD among HCPs in Mbarara city in southwestern Uganda. Having compassion fatigue is associated with an increased prevalence of MDD. However, compassion satisfaction and high resilience scores decrease the prevalence of GAD. Males and married HCPs have higher prevalence of MDD, but increase in age is associated with a decrease in GAD prevalence. We recommend development and implementation of comprehensive mental health programs for HCPs.

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**Data availability**
The dataset is publicly available under the following DOI: https://doi.org/10.6084/m9.figshare.25288033.

## Declarations

**Ethical approval and consent to participate**
The current study adhered to the principles outlined in the 2013 Declaration of Helsinki. Approval for the study was obtained from the Mbarara University of Science and Technology Research Ethics Committee (MUST-2023-779) and the Uganda National Council for Science and Technology (HS3037ES). Prior to participating in the study, all participants furnished informed written consent. Furthermore, all information pertaining to the participants was presented anonymously in this study.

**Consent to publish**
Not applicable.

**Competing interests**
The authors declare no competing interests.

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