Factors associated with burnout amongst healthcare workers providing HIV care in Malawi

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Abstract

Context

High rates of burnout have been reported in low and medium income countries and can detrimentally impact healthcare delivery. Understanding factors associated with burnout amongst health care workers providing HIV care may help develop interventions to prevent/treat burnout.

Objectives

We sought to understand factors associated with burnout amongst health care workers providing HIV care in Malawi.

Methods

This was a sub-study of a larger cross-sectional study measuring burnout prevalence amongst a convenience sample of healthcare workers providing HIV care in 89 health facilities in eight districts in Malawi. Burnout was measured using the Maslach Burnout Inventory. Anonymously administered surveys included questions about sociodemographics, work characteristics (work load, supervisor support, team interactions), depression, life stressors, assessment of type D personality, and career satisfaction. We performed univariable and multivariable regression analyses to explore associations between variables and burnout.

Results

We received 535 responses (response rate 99%). Factors associated with higher rates of burnout on multivariable regression analyses included individual level factors: male gender (OR 1.75 [CI 1.17, 2.63]; p = 0.007), marital status (widowed or divorced) (OR 3.24 [CI 1.32, 7.98]; p = 0.011), depression (OR 3.32 [CI 1.21, 9.10]; p = 0.020), type D personality type...
Factors associated with burnout amongst healthcare workers

Introduction

Healthcare workers (HCWs) are the foundation of an optimally functioning health system, so when HCWs are not well, the performance of the health care system suffers [1, 2]. Burnout is a syndrome resulting from chronic job-related stress and has three characteristics: emotional exhaustion (physical or emotional depletion), depersonalization (negative or cynical feelings about patients) and a sense of low personal accomplishment (how one perceives one’s own competency) [3].

Burnout has negative impacts on patient care, HCW health, and the healthcare system. In terms of patient care, burnout is associated with medical errors, lower quality of care, and lower patient satisfaction [4–8]. In terms of HCW health, burnout can contribute to physical and mental illness, poor self-care and substance abuse [6–10]. Burnout may also lead to decreased HCW productivity and performance, higher HCW turnover, and absenteeism [7, 10–14]; all of which negatively impact and result in financial losses to the healthcare system.

HCWs in sub-Saharan Africa (SSA) often work under burnout-inducing conditions: staffing shortages, rising numbers of patients, increasing burden of responsibility, low perceived control, unsupportive environments, staffing shortages, and the heavy weight of high rates of patient morbidity and mortality [15–17]. Research on burnout in SSA describes rates of 39–66% depending on country, HCW type, and survey instrument [18–22]. Despite these high rates, and the potential impact on patient care, there is a dearth of work examining factors associated with burnout in the SSA context; such research could inform the development of interventions to prevent and treat burnout and allay the negative downstream consequences of burnout.

In comparison, research describing HCW burnout in developed countries is firmly established, and the field has now largely moved towards examining potential interventions. In a recent comprehensive meta-analysis on burnout prevention and treatment interventions [21] only three of 52 studies included were conducted in low-income countries. That there were high rates of burnout amongst HCWs providing HIV care and that burnout was associated with a 3.2 times increased odds of reporting suboptimal patient care practices/attitudes [14].

There is a dearth of data on evidence-based culturally and contextually appropriate burnout reduction interventions. The present analysis seeks to address this gap by examining both individual and organizational/work-related factors that contribute to and protect against burnout. We hope that identification of these factors might inform the development of strategies to reduce burnout experienced by HCWs in Malawi who help care for an estimated number of 1,061,459 persons living with HIV every year [23].
Methods

Design and study setting

We analysed a sub-section of data that had been collected as part of a larger cross-sectional study conducted at 89 public health facilities within 8 districts in the south-eastern (districts: Balaka, Machinga, Mangochi, Mulanje, Phalombe, Zomba) and central regions (districts: Lilongwe, Salima) of Malawi from August 2015—January 2016 [14].

Ethical approval

The National Health Sciences Research Committee in Malawi, as well as the Baylor College of Medicine (BCM) IRB in USA, granted ethical approval.

Participants and data collection

The data collection procedures for this study have been previously described [14]. In brief, we approached a convenience sample of HCWs providing clinical care for people living with HIV (PLHIV) at 89 health facilities in central and southern Malawi to participate in the study. Of the 539 HCWs available and approached to participate, 535 (99%) consented and enrolled in the study. Participants completed self-administered written surveys. To reduce social desirability bias and encourage candid reporting the paper-based surveys were completed anonymously. As part of the consent procedure, participants were assured that their names would not be written anywhere on the surveys.

Survey measures

Measures fully detailed previously [14] are described in brief below. Study measures not mentioned previously [14], are explained in detail below.

**Burnout.** We assessed burnout via the 22-question Maslach Burnout Inventory (MBI); a widely validated instrument for assessing HCW burnout [3, 18, 20, 24–29]. The MBI measures three constructs of burn out: Emotional Exhaustion (EE); Depersonalization (DP), to measure negative or cynical feelings about patients; and Reduced Personal Accomplishment (PA), to measure how one perceives one’s own competency. The larger study modified the MBI prior to data collection. The MBI was modified to improve clarity and relevance in the Malawi context. The standardized Cronbach alpha coefficients for the modified MBI were better [EE (0.75), DP (0.55), and PA (0.74), as compared to EE (0.67), DP (0.42), and PA (0.60)] than those found in a burnout study previously performed in Malawi [28]. We defined burnout as scores in the mid-high range on the EE (17–54) or DP (7–30) subscales based on cut-off scores used previously in Malawi [14, 28].

**Depression, substance abuse, and personality type D.** Depression was assessed using the World Health Organization’s (WHO) 20-item self-reporting questionnaire (SRQ) which had been translated and validated in Malawi, [30, 31]. A cut-off score of 8 was defined as a positive screen for depression. The standardized Cronbach’s alpha for the SRQ in this study was 0.79; comparable to prior research using the SRQ in Malawi (Cronbach’s alpha, 0.85) [31]. We also asked about prior history of depression.

The widely validated WHO Alcohol Use Disorders Identification Test (AUDIT) [32] was used to screen for at-risk use of alcohol. A total score of 8 was considered a positive screen for potentially hazardous or harmful use of alcohol [32–34]. To measure use of other recreational drugs, we asked, “How often do you use other drugs (marijuana, etc.),” and the score was adapted from the Drug Use Disorders Identification Test (DUDIT) [35].
Type D or “distressed” personality (TDP) is the tendency to experience a high amount of negative affectivity (NA) and social inhibition (SI) together [36]. TDP was assessed using the Type D Scale-14 (DS14) which is the most accepted and widely used diagnostic instrument for the assessment of the TDP [37]. In prior studies, TDP has been found to be associated with burnout [36–39]. A cut off score of 10 (NA ≥10 and SI ≥10) was used to classify a participant as having TDP [37].

**Socio-demographic and work characteristics.** Participants’ self-reported demographics and work characteristics included: age, gender, marital status, number of children less than 5 years old, financial stress in the past 7 days. Work related demographic and characteristics included: HCW cadre, years worked as a HCW, type of health facility, number of hours worked in a typical week, time spent providing direct clinical care, number of patients seen in a typical week, adequacy of resources to provide quality care to patients, assessment of degree of support provided by the work environment and supervisor, need to perform work outside of regular duties to supplement one’s income, feeling that there are opportunities for growth, and satisfaction with work/team interaction (defined as ‘Yes’ if responding ‘Yes’ to the question ‘Do you enjoy your work-mates/colleagues?’ and ‘No’ to ‘Is there anyone at work who you have great difficulty working with?’). We assessed career satisfaction using three items modified from prior research [40]: 1) Would you choose to become a health worker again? 2) Would you recommend to your children that they consider a career as a health worker? 3) If you could, would you switch to another career outside of health care? For the summary career satisfaction score we summed up the scores for all three questions. Each question had a binary score with 1 indicating ‘Yes’ and 0 indicating ‘No’. The score for question 3 was reversed before summing.

**Data analysis**

Data were summarized by descriptive statistics (mean, SD, median, IQR, frequency). Chi-square test, two-sample t-test, and Fisher’s exact test were used to explore the associations between potential factors and burnout.

Logistic regression models were used to examine the association between burnout and individual level and structural/work related variables hypothesized to affect burnout based on prior work (socio-demographic and work-related demographics and characteristics, depression, alcohol/drug use and personality type D). We performed screening by univariable logistic regression. Variables were selected for inclusion in the model selection if their p-value was < 0.20 among the variables of interest. A backwards selection procedure was applied with a significance level of 0.05. Only variables with a p-value < 0.05 were retained in the final model. The scale for continuous variables was examined using quartiles to ensure a linear assumption was met prior to entry into the logistic model. The odds ratio estimates and their 95% confidence intervals were reported.

Missing items on the TDP and MBI were imputed using mean substitution for the same domain/subscale and the same participant [41–43]. Additional details can be found in the publication related to the larger study [14]. All analyses were performed using SAS software version 9.4 (SAS Institute, Inc., North Carolina, USA).

**Results**

There were 535 HCWs enrolled in the main study. Of these, 15 completed surveys were excluded due to significant missing data. The mean age (SD) was 34 (10.2) years, 59% were female, 58% were married, 7% had a positive depression screen, 6% met criterion for at-risk use of alcohol and 62% met criteria for burnout. The majority (88%) provided clinical care
more than 75% of the time, 71% felt they did not have adequate resources to provide quality care to patients, and 91% reported thinking additional HCWs were needed. A substantial proportion (36%) reported working more than 60 hours a week. We investigated financial stress and found that 87% reported feeling they needed to perform work outside of their regular duties to supplement their income and 79% reported stress due to their financial situation in the past week. In terms of career satisfaction, 88% reported that they would still choose to become a health worker again.

Univariable analysis of associations between burnout and other variables

Variables associated with burnout on univariable analysis (Table 1) included the following socio-demographic or psycho-social variables: financial stress in the past 7 days, depression (as measured by the WHO SRQ, cut off ≥8), Type D personality. Age, gender, marital status, alcohol and drug use, were not found to be associated with burnout. The following work-related variables (Table 1) were found to be significantly associated with burnout: health facility type, number of patients seen in a typical day, reported need for additional staff, support from one’s supervisor, work relationships (enjoyment or difficulty with colleagues), and career satisfaction. The number of hours worked in a week, amount of time spent providing direct clinical care, feeling of control over work schedule/tasks, need to supplement one’s income and opportunities for growth were not found to be significantly associated with burnout on univariable analysis.

Multivariable regression model: Factors associated with burnout

In multivariable analysis (Table 2), the following variables were found to be significantly associated with greater odds of burnout: male gender, being widowed/divorced vs. being single or married (we did not find any statistically significant difference between being married vs. single), health facility type (working at a health center vs. rural hospital), depression, and personality type D. Those who reported having a very supportive supervisor and being satisfied with work/team interactions had lower odds of having burnout. With each unit increase in career satisfaction score, there was a 24% decrease in odds of having burnout.

The c-statistic for this model is 0.71 indicating good discriminatory ability of the model; the value can range from 0 to 1 with a higher value indicating better discriminatory ability. The p-value of Hosmer-Lemeshow Goodness of fit test was 0.22 which is not significant (p > 0.05) demonstrating no lack of fit; in other words, the overall fit of the model was good.

Discussion

The primary goal of this study was to facilitate the development of burnout reduction interventions for healthcare workers in low resource settings like Malawi by identifying factors that might be amenable to interventions and were associated with burnout. The present study identified several characteristics that were significantly associated with burnout amongst health care workers providing HIV care. At the individual level factors included male gender, marital status (widowed/divorced), and depression. Work related factors included working at a health center vs. a rural hospital, lack of a very supportive supervisor, dissatisfaction with work/team relationships, and career dissatisfaction.

The HIV treatment response in Malawi has resulted in an enormous influx of additional patients into the healthcare system creating mounting demands on an already under-resourced system and its HCWs. Malawi’s total expenditure on health as a percentage of GDP is the highest in the Southern African Development Community (SADC) [44], perhaps suggesting the government’s commitment to healthcare. Unfortunately, despite this, Malawi’s
Table 1. Factors associated with burnout, univariable analysis.

| Variable                                                      | Burnout No | Burnout Yes | p-value |
|---------------------------------------------------------------|------------|-------------|---------|
| **Participant sociodemographics, depression, and personality type D** |            |             |         |
| Age, years, mean (SD)                                         | 33.7 (10.3) | 33.8 (10.1) | 0.948   |
| Gender, n (%)                                                 |            |             | 0.089   |
| Male                                                          | 73 (34)    | 142 (66)    |         |
| Female                                                        | 126 (41.3) | 179 (58.7)  |         |
| Marital Status, n (%)                                         |            |             | 0.075   |
| Married                                                       | 123 (40.9) | 178 (59.1)  |         |
| Widowed/divorced                                              | 9 (22.5)   | 31 (77.5)   |         |
| Single                                                        | 66 (37.1)  | 112 (62.9)  |         |
| Children less than 5 years old, n (%)                         |            |             | 0.339   |
| No                                                            | 119 (36.4) | 208 (63.6)  |         |
| Yes                                                           | 76 (40.6)  | 111 (59.4)  |         |
| Stress due to financial situation in the past 7 days, n (%)   |            |             | 0.006   |
| None                                                          | 55 (49.5)  | 56 (50.5)   |         |
| Yes                                                           | 144 (35.2) | 265 (64.8)  |         |
| At-risk alcohol use (>1/ = 8)* n (%)                          |            |             | 0.331   |
| No                                                            | 189 (38.8) | 298 (61.2)  |         |
| Yes                                                           | 10 (30.3)  | 23 (69.7)   |         |
| Other drug use, n (%)                                         |            |             | 0.628   |
| Never                                                         | 197 (38.2) | 319 (61.8)  |         |
| A few times a year                                            | 2 (50)     | 2 (50)      |         |
| Depression- positive screen (>1/ = 8), n (%)                  |            |             | 0.002   |
| No                                                            | 194 (40.2) | 289 (59.8)  |         |
| Yes                                                           | 5 (13.9)   | 31 (81.6)   |         |
| Suicidal Ideation, n (%)                                      |            |             | 0.085   |
| No                                                            | 195 (39.1) | 304 (60.9)  |         |
| Yes                                                           | 4 (20)     | 16 (80)     |         |
| History of Depression, n (%)                                  |            |             | 0.072   |
| No                                                            | 194 (39.1) | 302 (60.9)  |         |
| Yes                                                           | 5 (20.8)   | 19 (79.2)   |         |
| Personality Type D, n (%)                                     |            |             | <0.0001 |
| No                                                            | 181 (42.1) | 249 (57.9)  |         |
| Yes                                                           | 17 (19.1)  | 72 (80.9)   |         |
| **Work related demographics and environment**                 |            |             |         |
| Type of HCW, n (%)                                            |            |             | 0.487   |
| Medical Officer/Clinical officer/Medical assistant            | 69 (36.3)  | 121 (63.7)  |         |
| Nurse midwife technician/state registered nurse               | 130 (39.4) | 200 (60.6)  |         |
| Years worked as a health care worker, median (IQR)            | 6 (3–10)   | 5 (3–11)    | 0.856   |
| Health facility type, n (%)                                   |            |             | 0.035   |
| District Hospital                                             | 54 (40.3)  | 80 (59.7)   |         |
| Rural Hospital                                                | 44 (48.9)  | 46 (51.1)   |         |
| Health center or other                                        | 101 (34.1) | 195 (65.9)  |         |
| Number of hours worked in a week, n (%)                       |            |             | 0.494   |
| Less than 40 hours                                            | 12 (34.3)  | 23 (65.7)   |         |
| 40–50 hours                                                   | 94 (40.9)  | 136 (59.1)  |         |
| 51–60 hours                                                   | 28 (41.2)  | 40 (58.8)   |         |
| More than 60 hours                                            | 63 (34.2)  | 121 (65.8)  |         |
| Time spent providing direct clinical care, n (%)              |            |             | 0.820   |
| All of my time                                                | 97 (39)    | 152 (61)    |         |

(Continued)
| Variable | Burnout No | Burnout Yes | p-value |
|----------|------------|-------------|---------|
| >75%     | 77 (37.6)  | 128 (62.4)  |         |
| 50%      | 16 (39)    | 25 (61)     |         |
| <50% or don’t provide clinical care | 6 (28.6) | 15 (71.4) | 0.024 |
| How many clients do you see in a typical day, n (%) | | | 0.024 |
| < 25 hours | 60 (47.2) | 67 (52.8) | |
| 25 to <50 hours | 75 (40.5) | 110 (59.5) | |
| 50 to 100 hours | 37 (34.6) | 70 (65.4) | |
| >100 hours | 22 (27.2) | 59 (72.8) | |
| Do you feel that you have adequate facility resources to provide quality care to patients, n (%) | | | 0.062 |
| No | 130 (35.7) | 234 (64.3) | |
| Yes | 69 (44.5) | 86 (55.5) | |
| Do you think your department needs additional members to accomplish your tasks, n (%) | | | 0.034 |
| No | 23 (53.5) | 20 (46.5) | |
| Yes | 175 (36.8) | 300 (63.2) | |
| How would you classify your work environment, n (%) | | | 0.077 |
| Very supportive | 26 (53.1) | 23 (46.9) | |
| Supportive | 141 (37) | 240 (63) | |
| Not supportive | 31 (35.2) | 57 (64.8) | |
| Do you feel supported by your supervisor, n (%) | | | 0.016 |
| Very supported | 35 (53.8) | 30 (46.2) | |
| Supported | 139 (36.9) | 238 (63.1) | |
| Not supported | 24 (32) | 51 (68) | |
| How much control do you feel that you have over your work schedule and tasks, n (%) | | | 0.109 |
| A lot | 62 (34.4) | 118 (65.6) | |
| Some | 93 (37.2) | 118 (65.6) | |
| Not much | 34 (45.9) | 40 (54.1) | |
| None | 8 (61.5) | 5 (38.5) | |
| Do you need to perform work outside your regular duties to supplement your income, n (%) | | | 0.166 |
| No | 32 (45.7) | 38 (54.3) | |
| Yes | 166 (37.1) | 282 (62.9) | |
| Do you feel that you have opportunities for career growth, n (%) | | | 0.199 |
| No | 27 (31.8) | 58 (68.2) | |
| Yes | 168 (39.2) | | |
| Do you enjoy your workmates/colleagues, n (%) | | | 0.007 |
| No | 6 (16.7) | 30 (83.3) | |
| Yes | 190 (39.6) | 290 (60.4) | |
| Is there anyone at work who you have great difficulty working with, n (%) | | | 0.000 |
| No | 143 (44.4) | 179 (55.6) | |
| Yes | 55 (28.1) | 141 (71.9) | |
| Satisfied with work/team interaction, n (%) | | | <0.0001 |
| No | 57 (27.5) | 150 (72.5) | |
| Yes | 139 (45) | 170 (55) | |
| Career Satisfaction | | | |
| Would you choose to become a health worker again, n (%) | | | 0.027 |
| No | 15 (25) | 45 (75) | |
| Yes | 181 (39.8) | 274 (60.2) | |
| Would you recommend that to your children that they consider a career as a health worker, n (%) | | | 0.066 |
| No | 172 (40) | 258 (60) | |

(Continued)
Table 1. (Continued)

| Variable                                      | Burnout No | Burnout Yes | p-value |
|-----------------------------------------------|------------|-------------|---------|
| If you could, would you switch to another career outside of health care, n (%) |            |             |         |
| Yes                                           | 26 (29.5)  | 62 (70.5)   | 0.002   |
| No                                            | 164 (42.2) | 225 (57.8)  |         |
| Yes                                           | 32 (26.2)  | 90 (73.8)   |         |
| Sum of career items                           |            |             | 0.024   |
| 0                                             | 7 (18.4)   | 31 (81.6)   |         |
| 1                                             | 11 (31.4)  | 24 (68.6)   |         |
| 2                                             | 29 (34.5)  | 55 (65.5)   |         |
| 3                                             | 147 (41.9) | 204 (58.1)  |         |
| Sum if career items, mean (SD)                | 2.63 (0.75) | 2.38 (0.99) | 0.001   |

Analyses by chi-square test unless otherwise noted.

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| Variable                                      | OR [95% CI] | p-value | What does this mean? |
|-----------------------------------------------|-------------|---------|-----------------------|
| Male vs Female                                | 1.75 [1.17, 2.63] | 0.007   | Males were 1.75 times more likely to have burn out than females |
| Marital status                                |             |         |                       |
| Married vs. single                            | 0.92 [0.60, 1.40] | 0.694   | No significant difference |
| Widowed/divorced vs. single                   | 3.24 [1.32, 7.98] | 0.011   | Those who were widowed/divorced were 3.24 times more likely to have burn out than those who were single |
| Widowed/divorced vs. Married                  | 3.52 [1.47, 8.47] | 0.005   | Those who were widowed/divorced were 3.52 times more likely to have burn out than those who were married |
| Health facility type                          |             |         |                       |
| District hospital vs. rural                   | 1.47 [0.81, 2.67] | 0.203   | No significant difference |
| Health centre vs. rural                      | 2.02 [1.19, 3.40] | 0.009   | Those working in health centre were 2.02 times more likely to have burn out than those working in rural hospital |
| Health centre vs. district hospital           | 1.37 [0.86, 2.18] | 0.182   | No significant difference |
| Support from supervisor                       |             |         |                       |
| Supportive vs. very supportive                | 2.38 [1.32, 4.29] | 0.004   | Those whose supervisor was supportive were 2.38 more likely to have burn out than those whose supervisor was very supportive |
| Not supportive vs. very supportive            | 2.34 [1.09, 4.99] | 0.029   | Those whose supervisor was not supportive were 2.34 more likely to have burn out than those whose supervisor was very supportive |
| Supportive vs. not supportive                 | 1.02 [0.57, 1.81] | 0.954   | No significant difference |
| Satisfied with work/team interactions no vs yes| 1.76 [1.17, 2.66] | 0.007   | Those not satisfied with their work/team interaction were 1.76 times more likely to have burn out than those who were satisfied |
| Depression score ≥8                          | 3.32 [1.21, 9.10] | 0.020   | Those with depression score ≥8 were 3.32 times more likely to have burn out than those with depression score <8 |
| Type D personality, yes vs no                | 2.77 [1.50, 5.12] | 0.001   | Those with type D personality were 2.77 times more likely to have burn out than those without type D personality |
| Career satisfaction                          | 0.76 [0.60, 0.96] | 0.020   | With each unit increase in career satisfaction score, there was a 24% decrease in odds of having burn out. |

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healthcare system is highly underfunded, with the lowest health spending per capita in the SADC due to the very low GDP per capita of only $339 USD. Donor support provides close to 80% of the healthcare expenditure, and has become more and more fragmented and increasingly focused on treating specific diseases [45]. The disease specific donor funding, often neglects the basic primary health care systems and human resources that are the essential foundation required to achieve optimal health outcomes.

In the context of these considerable structural limitations, there is an urgent need for strategies focused on strengthening the healthcare workforce by preventing/managing HCW burnout. The situation is grave. Studies on HCW burnout from sub-Saharan African countries including Malawi, report burnout rates ranging from 33–66% [9, 14, 18, 19, 22, 25, 28], and burnout can have destructive implications for patient outcomes. For example, in Malawi, there has been an increase in the number of individuals living with HIV who are not retained in ART care. Currently, in Malawi only 72% of adults and 77% of children were retained alive on ART 12 months after ART initiation [23]. The poor retention rate could be a downstream effect of suboptimal patient care practices resulting from HCW burnout [14]. Burnout can result in acrimonious relationships with patients. Malawian and South African patients have reported that conflicts with providers led some to stop coming to clinic visits, eventually abandoning clinic care [46, 47].

Our present study identified several areas at both the individual and organizational/work related level, that are amenable to interventions. Finding the resources to develop and deliver these interventions will be challenging but our study suggests that the time is ripe. Although burnout was associated with decreased career satisfaction, the majority of HCWs reported that they would still choose to become a HCW again. This suggests dedication and interest in this career path; and therefore, HCWs that would be eager to receive burnout reduction support.

Addressing HCW burnout is a shared responsibility between individual HCWs and work organizations, and therefore requires both individual (HCW) level and organizational/work-related interventions [8]. We identified specific individual level factors associated with high rates of burnout including gender, marital status, depression, and personality type D; these findings are consistent with studies from other countries [36, 39, 48–50]. This was a cross-sectional study, so we are unable to determine causality. For example, did depression contribute to vulnerability to burnout? Or did burnout lead to depression? However, our data suggest that men, those who are widowed/divorced, are depressed, or have personality type D may be more vulnerable to burnout. Individual level interventions that have been shown to be effective in reducing burnout in other settings include mindfulness based stress reduction, stress management training, therapy, as well as small-group activities with other HCWs to share work experiences [8]. Many of these interventions are feasible even within a resource-limited setting and should be explored.

Organizational interventions have high potential to ease burnout [8]. We identified modifiable work related characteristics associated with burnout that could be improved by health facility leadership and Ministry of Health. HCWs working at district hospitals and non-rural health centers had higher odds of burnout. This may be due to stresses of working at these typically higher volume, sub-optimally staffed facilities. Consistent with HCW burnout studies from other countries, having very supportive supervisors and positive work/team engagement was protective [9, 51]. Ill prepared clinicians without management experience or training are often hoisted into supervisory roles [52]. Leadership/management training could equip clinician supervisors to provide more supportive supervision, tackle challenging employees who may be negatively affecting team morale, and craft healthier work environments.

Although financial stress was not associated with burnout in the final MVLR model, we did find a significant bivariate association. In addition, the majority (86%) reported financial stress...
in the past week as well as the need to work outside their clinical duties to supplement their incomes (86%). Inadequate HCW compensation has been a chronic challenge in resource-limited settings [53–57]. Although in the short run such costs may seem prohibitive, adequate salaries may reduce absenteeism (because HCW will be less inclined to seek additional paying work outside the clinic), as well as burnout, resulting in improved patient outcomes and cost savings.

Despite an urgent need to address burnout amongst HCWs in Malawi, unfortunately, we are not aware of any burnout reduction or prevention interventions that have been developed, piloted, tested, or implemented in Malawi. In contrast, there is an abundance of research on HCW burnout interventions in the northern hemisphere demonstrating that both individual-focused and structural or organizational strategies can result in clinically meaningful reductions in burnout [17, 58]. However, it is unclear whether or not these same types of interventions will work in the Malawian context. There is a paucity of evidence on potential burnout reduction interventions from resource-limited settings. By identifying both individual and structural level factors that could inform intervention development, our study represents an initial step towards addressing this gap.

Our study had a high response rate and although self-reported surveys may be inclined to social desirability bias, the surveys were conducted anonymously to try and reduce this bias. In addition, surveys were conducted in both rural and urban settings and throughout central and southern Malawi and therefore, the results are likely representative of HCWs providing HIV care in most of Malawi. We explored various factors that have been linked to burnout in other countries, and although we did not utilize more comprehensive scales due to length [59], we explored work-related and organizational characteristics thought to contribute to burnout such as work team dynamics, organizational constraints, workload, lack of control in the work environment, and opportunities for career growth. Surprisingly, hypothesized contributors to burnout such as workload, lack of opportunities for career growth, and lack of control in the work environment [60–62], were not found to be linked to burnout in our study. This might be because we assessed these characteristics using single questions, which perhaps did not sufficiently assess these characteristics. In future studies, it would be helpful to use more comprehensive scales such as the five-item Quantitative Workload Inventory [59] to further explore these hypothesized burnout contributors.

**Conclusion**

In summary, we identified several factors associated with burnout amongst healthcare workers providing HIV care. Individual level factors included male gender, marital status (widowed/divorced), and depression. Work-related factors were working at a health center vs. a rural hospital, lack of a very supportive supervisor, dissatisfaction with work/team interaction, and career dissatisfaction. Our results underscore the critical need for strategies to prevent/manage HCW burnout in Malawi, and identify both individual and organizational level characteristics that future interventions could address.

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References

1. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. Annals of family medicine. 2014; 12(6):573–6. https://doi.org/10.1370/afm.1713 PMID: 25384822

2. Epstein RM, Privitera MR. Doing something about physician burnout. Lancet (London, England). 2016; 388(10057):2216–7. https://doi.org/10.1016/S0140-6736(16)31332-0

3. Maslach C, Jackson SE, Leiter MP. Maslach burnout inventory. Evaluating stress: A book of resources. 1997; 3:191–218. Lanham, MD, US: Scarecrow Education. [cited 2019 Mar 12]. https://www.researchgate.net/publication/277816643_The_Maslach_Burnout_Inventory_Manual

4. Poghosyan L, Clarke SP, Finlayson M, Aiken LH. Nurse burnout and quality of care: cross-national investigation in six countries. Research in nursing & health. 2010; 33(4):288–98. https://doi.org/10.1002/nur.20383 PMID: 20645421

5. Salyers MP, Bonfils KA, Luther L, Firmin RL, White DA, Adams EL, et al. The relationship between professional burnout and quality and safety in healthcare: A meta-analysis. Journal of general internal medicine. 2017; 32(4):475–82. https://doi.org/10.1007/s11606-016-3886-9 PMID: 27785668

6. Seo HS, Kim H, Hwang SM, Hong SH, Lee Y. Predictors of job satisfaction and burnout among tuberculosis management nurses and physicians. Epidemiology and Health. 2016; 38:e2016008. https://doi.org/10.4178/eph/e2016008 PMID: 26971698

7. Suñer-Soler R, Grau-Martín A, Flichtentrei D, Prats M, Braga F, Font-Mayolas S, et al. The consequences of burnout syndrome among healthcare professionals in Spain and Spanish speaking Latin American countries. Burnout Research. 2014; 1(2):Pages 82–9. https://doi.org/10.1016/j.burn.2014.07.004

8. West CP, Dyrbeye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. Journal of internal medicine. 2016; 283(6):516–29. https://doi.org/10.1111/joim.12752 PMID: 29505159

9. Dugani S, Afari H, Hirschorn LR, Ratcliffe H, Veillard J, Martin G, et al. Prevalence and factors associated with burnout among frontline primary health care providers in low- and middle-income countries: A systematic review. Gates open research. 2018; 2:4. https://doi.org/10.12688/gatesopenres.12779.3 PMID: 29984356
10. Salvagioni DAJ, Melanda FN, Mesas AE, Gonzalez AD, Gabani FL, Andrade SM. Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. PLoS one. 2017; 12(10):e0185781. https://doi.org/10.1371/journal.pone.0185781 PMID: 28977041

11. Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. Ann Intern Med. 2002; 136(5):358–67. https://doi.org/10.7326/0003-4819-136-5-200203050-00008 PMID: 11874308

12. Shanafelt TD, Balch CM, Bechamps G, Russell T, Satele D, et al. Burnout and medical errors among American surgeons. Ann Surg. 2010; 251(6):995–1000. https://doi.org/10.1097/SLA.0b013e3181fbdab3 PMID: 19934755

13. West MA, Guthrie JP, Dawson JF, Borrill CS, Carter M. Reducing patient mortality in hospitals: the role of human resource management. J Organ Behav. 2006; 27(7):983–1002. https://doi.org/10.1002/job.396

14. Kim MH, Mazenga AC, Simon K, Yu X, Ahmed S, Nyasulu P, et al. Burnout and self-reported suboptimal patient care amongst health care workers providing HIV care in Malawi. PLoS one. 2018; 13(2):e0192983. https://doi.org/10.1371/journal.pone.0192983 PMID: 29466443

15. Anyangwe SC, Mtonga C. Inequities in the global health workforce: the greatest impediment to health in sub-Saharan Africa. International journal of environmental research and public health. 2007; 4(2):93–100. PMID: 17617671

16. Sikka R, Morath JM, Leape L. The Quadruple Aim: care, health, cost and meaning in work. BMJ quality & safety. 2015; 24(10):608–10. https://doi.org/10.1136/bmjqs-2015-004160 PMID: 26038586

17. West CP, Dyrbye LN, Erwin PJ, Shanafelt TD. Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis. Lancet (London, England). 2016; 388(10057):2272–81. https://doi.org/10.1016/S0140-6736(16)31279-X

18. Dierelman M, Biemba G, Mphuka S, Sichinga-Sichali K, Sissolak D, van der Kwaak A, et al. ‘We are also dying like any other people, we are also people’: perceptions of the impact of HIV/AIDS on health workers in two districts in Zambia. Health policy and planning. 2007; 22(3):139–48. https://doi.org/10.1093/heapol/czm006 PMID: 17400577

19. Kruse GR, Chapula BT, Ikeda S, Nkhoma M, Quiterio N, Pankratz D, et al. Burnout and use of HIV services among health care workers in Lusaka District, Zambia: a cross-sectional study. Human resources for health. 2009; 7:55. https://doi.org/10.1186/1478-4491-7-55 PMID: 19594917

20. Malawi Ministry of Health: Integrated HIV Program Quarterly Report July-September 2018. Lilongwe: Department of HIV and AIDS; 2018.

21. Jordaan I, Spangenberg JJ, Watson MB, Fouché P. Emotional stress and coping strategies in South African clinical and counselling psychologists. South African Journal of psychology., 2007; 37(4):835–55. https://doi.org/10.1177/008124630703700411

22. Perry L, Rech D, Mavhu W, Frade S, Machaku MD, Onyango M, et al. Work experience, job-fulfillment and burnout among VMMC providers in Kenya, South Africa, Tanzania and Zimbabwe. PloS one. 2014; 9(5):e84215. https://doi.org/10.1371/journal.pone.0084215 PMID: 24802260

23. Malawi Ministry of Health: Integrated HIV Program Quarterly Report July-September 2018. Lilongwe: Department of HIV and AIDS; 2018.

24. Khamisa N, Oldenburg B, Peltzer K, Ilic D. Work related stress, burnout, job satisfaction and general health of nurses. International journal of environmental research and public health. 2015; 12(1):652–66. https://doi.org/10.3390/ijerph120100652 PMID: 25588157

25. Thorsen VC, Tharp AL, Meguid T. High rates of burnout among maternal health staff at a referral hospital in Malawi: A cross-sectional study. BMC nursing. 2011; 10:9. https://doi.org/10.1186/1472-6955-10-9 PMID: 21605379

26. Olley BO. A comparative study of burnout syndrome among health professionals in a Nigerian teaching hospital. African journal of medicine and medical sciences. 2003; 32(3):297–302. PMID: 15030092

27. Pienaar J, Wyk Dv. Teacher burnout: construct equivalence and the role of union membership. South African Journal of Education. 2006; 26 (4):541–51.

28. Rothmann S, Essenko N. Job characteristics, optimism, burnout, and ill health of support staff in a higher education institution in South Africa. South African Journal of psychology. Vol 37, (Issue 1):135–52. https://doi.org/10.1177/008124630703700110

29. Beusenberg M, Orley JH. A User’s guide to the self reporting questionnaire (SRQ). Geneva: World Health Organization; 1994. [cited 2019 Mar 12]. https://apps.who.int/iris/handle/10665/61113.
31. Stewart RC, Kauye F, Umar E, Vokhiwa M, Bunn J, Fitzgerald M, et al. Validation of a Chichewa version of the self-reporting questionnaire (SRQ) as a brief screening measure for maternal depressive disorder in Malawi, Africa. J Affect Disord. 2009; 112(1–3):126–34. https://doi.org/10.1016/j.jad.2008.04.001 PMID: 18504058

32. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. AUDIT: the Alcohol Use Disorders Identification Test: guidelines for use in primary health care. World Health Organization. 2001, 2nd ed. [cited 2019 Mar 12]. https://apps.who.int/iris/handle/10665/67205.

33. Peltzer K, Davids A, Njuho P. Alcohol use and problem drinking in South Africa: findings from a national population-based survey. Afr J Psychiatry. 2011; 14(1). PMID: 21509408

34. Zverev Y. Problem drinking among university students in Malawi. Coll Antropol. 2008; 32(1):27–31. PMID: 18494185

35. Berman A, Bergman H, Palmstierna T, Schlyter F. The Drug Use Disorders Identification Test (DUDIT) Manual. Stockholm, Sweden: Karolinska Institutet. 2003. [cited 2019 Mar 12]. https://paihelinki.fi/sites/default/files/duditmanual.pdf.

36. Armon G. Type D personality and job burnout: The moderating role of physical activity. Personality and individual differences 2014; 58:112–5. https://doi.org/10.1016/j.paid.2013.10.020

37. Denollet J. DS14: standard assessment of negative affectivity, social inhibition, and Type D personality. Psychosomatic medicine. 2005; 67(1):89–97. https://doi.org/10.1097/01.psy.0000149256.81953.49 PMID: 15673629

38. Polman R, Borkoles E, Nicholls AR. Type D personality, stress, and symptoms of burnout: the influence of avoidance coping and social support. British journal of health psychology. 2010; 15(Pt 3):681–96. https://doi.org/10.1348/135910709X479069 PMID: 19930789

39. Tekin A, Karadag H, Yayla S. The relationship between burnout symptoms and Type D personality among health care professionals in Turkey. Archives of environmental & occupational health. 2017; 72(3):173–7. https://doi.org/10.1080/19338244.2016.1179168 PMID: 27120565

40. Shanafelt TD. Enhancing meaning in work: a prescription for preventing physician burnout and promoting patient-centered care. Jama. 2009; 302(12):1338–40. https://doi.org/10.1001/jama.2009.1385 PMID: 19773573

41. Ahola K, Honkonen T, Isometsä E, Kalimo R, Nykyri E, Aromaa A, et al. The relationship between job-related burnout and depressive disorders—results from the Finnish Health 2000 Study. J Affect Disord. 2005; 88(1):55–62. https://doi.org/10.1016/j.jad.2005.06.004 PMID: 16039894

42. Marcelino G, Cerveira JM, Carvalho I, Costa JA, Lopes M, Calado NE, et al. Burnout levels among Portuguese family doctors: a nationwide survey. BMJ Open. 2012; 2(3):e001050. https://doi.org/10.1136/bmjopen-2012-001050 PMID: 22710131

43. Smith HK. Testing work characteristics as mediating factors in the relationships among nurse leadership, burnout, and engagement. 2012.

44. UNICEF. 2017/18 Health Budget Brief: Towards Universal Health Coverage New York; 2017. [cited 2019 Mar 12]. https://www.unicef.org/malawi/media/411/file

45. World Health Organization. Global Health Expenditure Database. Geneva; 2018. [cited 2019 Mar 12]. https://www.who.int/health_financing/topics/resource-tracking/ghed-update/en/

46. Coetzee SK, Klopper HC, Ellis SM, Aiken LH. A tale of two systems—nurses practice environment, well being, perceived quality of care and patient safety in private and public hospitals in South Africa: a questionnaire survey. International journal of nursing studies. 2013; 50(2):162–73. https://doi.org/10.1016/j.ijnurstu.2012.11.002 PMID: 23218020

47. Kim MH, Zhou A, Mazenga A, Ahmed S, Markham C, Zomba G, et al. Why did I stop? Barriers and facilitators to uptake and adherence to ART in Option B+ HIV care in Lilongwe, Malawi. PloS one. 2016; 11(2):e0149527. https://doi.org/10.1371/journal.pone.0149527 PMID: 26901563

48. Llorent VJ, Ruiz-Calzado I. Burnout and its relation to sociodemographic variables among education professionals working with people with disabilities in Cordoba (Spain). Ciencia & saude coletiva. 2016; 21(10):3287–95. https://doi.org/10.1590/1413-812320152110.00732015 PMID: 27783801

49. Canudas-De la Fuente GA, Ortega E, Ramirez-Baena L, De la Fuente-Solana EI, Vargas C, Gomez-Urquiza JL. Gender, marital status, and children as risk factors for burnout in nurses: A meta-analytic study. International journal of environmental research and public health. 2018; 15(10). https://doi.org/10.3390/ijerph15102102 PMID: 30257449

50. Ramirez-Baena L, Ortega-Campos E, Gomez-Urquiza JL, Canudas-De la Fuente GR, De la Fuente-Solana EI, Canudas-De la Fuente GA. A multicentre study of burnout prevalence and related psychological variables in medical area hospital nurses. Journal of clinical medicine. 2019; 8(1). https://doi.org/10.3390/jcm8010092 PMID: 30650557
51. Guidroz AM, Wang M, Perez LM. Developing a model of source-specific interpersonal conflict in health care. Stress and health: journal of the International Society for the Investigation of Stress. 2012; 28(1):69–79. https://doi.org/10.1002/sm.1405 PMID: 22259160
52. Hana J, Maleta K, Kirkaugas R, Hasvold T. “PHC leadership: are health centres in good hands? Perspectives from 3 districts in Malawi”. Malawi medical journal: the journal of Medical Association of Malawi. 2012; 24(3):46–51. PMID: 23638273
53. Chikaphupha KR, Kok MC, Nyirenda L, Namakhoma I, Theobald S. Motivation of health surveillance assistants in Malawi: A qualitative study. Malawi medical journal: the journal of Medical Association of Malawi. 2016; 28(2):37–42. PMID: 27895826
54. Manafa O, McAuliffe E, Maseko F, Bowie C, MacLachlan M, Normand C. Retention of health workers in Malawi: perspectives of health workers and district management. Human resources for health. 2009; 7:65. https://doi.org/10.1186/1478-4491-7-65 PMID: 19638222
55. Muula AS, Maseko FC. How are health professionals earning their living in Malawi? BMC health services research. 2006; 6:97. https://doi.org/10.1186/1472-6963-6-97 PMID: 16899130
56. Schmiedekehncht K, Perera M, Schell E, Jere J, Geoffroy E, Rankin S. Predictors of workforce retention among Malawian nurse graduates of a scholarship program: a mixed-methods study. Global health, science and practice. 2015; 3(1):85–96. https://doi.org/10.9745/GHSP-D-14-00170 PMID: 25745122
57. Chimwaza W, Chipeta E, Ngwira A, Kamwendo F, Taulo F, Bradley S, et al. What makes staff consider leaving the health service in Malawi? Human resources for health. 2014; 12:17. https://doi.org/10.1186/1478-4491-12-17 PMID: 24641840
58. West CP, Dyrbye LN, Rabatin JT, Call TG, Davidson JH, Multari A, et al. Intervention to promote physician well-being, job satisfaction, and professionalism: a randomized clinical trial. JAMA internal medicine. 2014; 174(4):527–33. https://doi.org/10.1001/jamainternmed.2013.14387 PMID: 24515493
59. Spector PE, Jex SM. Development of Four Self-Report Measures of Job Stressors and Strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. Journal of occupational health psychology. 1998; 3(4):356–67. https://doi.org/10.1037/1076-8998.3.4.356 PMID: 9805281
60. Coetzee B, Kagee A, Vermeulen N. Structural barriers to adherence to antiretroviral therapy in a resource-constrained setting: the perspectives of health care providers. AIDS care. 2011; 23(2):146–51. https://doi.org/10.1080/09540121.2010.498874 PMID: 21259126
61. Gorgens-Ekermans G, Brand T. Emotional intelligence as a moderator in the stress-burnout relationship: a questionnaire study on nurses. Journal of clinical nursing. 2012; 21(15–16):2275–85. https://doi.org/10.1111/j.1365-2702.2012.04171.x PMID: 22788561
62. Leiter MP, Maslach C. Six areas of worklife: a model of the organizational context of burnout. Journal of health and human services administration. 1999; 21(4):472–89. PMID: 10621016