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Associations between Healthcare Worker Participation in Workplace Wellness Activities and Job Satisfaction, Occupational Stress, and Burnout: A Cross-Sectional Study in Botswana

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Title: Associations between Healthcare Worker Participation in Workplace Wellness Activities and Job Satisfaction, Occupational Stress, and Burnout: A Cross-Sectional Study in Botswana

Running title: Association Wellness Activities Job Satisfaction, Stress, Burnout

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Abstract

Objectives

Healthcare workers (HWs) are prone to high levels of stress and burnout, particularly when caring for people with HIV/AIDS. This study assessed whether participation in Botswana's Workplace Wellness Program for HWs (WWP) was associated with job satisfaction, occupational stress, well-being, and burnout.

Methods

Using multi-stage sampling, a paper-based questionnaire was distributed to 1,856 randomly selected HWs at 135 public facilities across Botswana. Well-validated scales assessed key outcomes. ANCOVA models were built for psychosocial factors associated with WWP participation, controlling for associated demographics.

Results

Response rate was 73% (n=1,348). The majority of respondents were female (62%), not married (65%) and had children (84%). Mean age was 40.0 years (SD±9.9). Respondents were roughly split between participation in 0 WWP activities (29.4%), 1-6 WWP activities (38.9%), and 7 or more WWP activities (31.7%) in the past year. High participation was associated with older age, being a doctor or other professional, working at hospitals or District Health Management Teams, working longer in health services, or working longer at a facility. In unadjusted analyses, high participation was significantly associated ($p<0.05$) with higher satisfaction with overall job, work, supervision, promotion, pay, and professional efficacy; and lower stress, exhaustion, and cynicism. All associations remained significant in controlled analyses except cynicism.

Conclusions

Results from this study suggest participation in workplace wellness activities is associated with higher satisfaction with multiple job facets and lower stress, exhaustion, and cynicism. Introduction of these activities may help ameliorate high occupational stress levels among HWs.

Article Summary. Strengths and limitations of this study:

- Strengths include a multilevel random sampling methodology and use of previously validated scales.
- The survey had a relatively high response rate (73%).
- Limitations include an inability to determine the direction of causality due to the cross-sectional nature of the survey.

Introduction

Healthcare professionals are prone to high levels of occupational stress and burnout. This is due to long hours and the emotional weight of treating sick patients⁽¹⁾. It is especially common among providers who work with People Living with HIV/AIDS (PLHA)⁽²⁾. In the early years of the epidemic, the stress was primarily due to stigma around the disease, lack of understanding of transmission and treatment, and the extremely high mortality rate. The introduction of highly active antiretroviral therapy (HAART) and increased community and clinical HIV knowledge has lessened stress on providers. However, many providers still experience burnout from the emotional toll of caring for sick patients, workplace demands, lack of supervision, unresolved grief, feelings of helplessness and ineffectiveness, and an absence of gratitude from individuals and communities.^(3,4)

In sub-Saharan Africa, high demand for services and insufficient resources are still commonplace, resulting in tense environments for health workers involved in HIV treatment, care, and support. This situation may be compounded by the new Joint United Nations Programme on HIV/AIDS (UNAIDS) targets of having 90% of PLHA know their status, 90% of people who know they have HIV on ARV treatment, and 90% of PLHA on treatment virally suppressed.⁽⁵⁾

Botswana, with an 18.5% prevalence rate, has been one of the countries most affected by the HIV epidemic.⁽⁶⁾ A survey conducted in 2006 indicated there were high levels of stress and burnout among health workers in Botswana, due in part to the rising burden of HIV/AIDS patients and the related stress on the healthcare system.⁽⁷⁾ In response, the Botswana Ministry of Health (MOH) began implementing a comprehensive Workplace Wellness Program (WWP) for healthcare workers in 2007.⁽⁸⁾ This initiative aimed to improve health and well-being and reduce stress among health workers in government facilities by empowering them with knowledge and skills to manage the dynamic demands of the health care system.⁽⁷⁾ WWP implementation has been described previously.⁽⁹⁾ Briefly, the program focused on holistic improvements in the health and well-being through activities focusing on: health screening, treatment, and care; health promotion; stress management and team building; occupational health and safety; psychosocial and spiritual care; and therapeutic recreation.

Data from high-income settings suggest that workplace wellness programs can have numerous benefits, including lowered healthcare costs, reduced absenteeism, increased productivity, and positive economic impact.⁽¹⁰⁻¹⁴⁾ However the situation is different in less

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3 resourced countries, with higher reported levels of anxiety, depression, and health risks⁽¹⁵⁾ and
4 lower nutritional habits and physical activity⁽¹⁶⁾. Thus, little is known about the effectiveness of
5 workplace wellness programs when implemented to improve occupational health among health
6 workers in these settings, outside of a few studies in South Africa.⁽¹⁷⁻²⁰⁾ Therefore, a nationally
7 representative survey of health workers in Botswana was conducted to determine if there were
8 associations between participation in WWP activities with individuals' levels of job satisfaction,
9 psychological well-being, burnout, and sources of stress.
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16 **Methods**

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18 This was a cross-sectional survey of staff employed at public health facilities in
19 Botswana. Individuals had to be employed in a selected public health facility to be eligible to
20 participate. A self-administered questionnaire was distributed to randomly selected health
21 workers in public health facilities using multi-stage sampling. The first sampling stage was to
22 select the health facilities, using a random number generator to select five facilities in each of
23 Botswana's 27 health districts. For each district, one facility was selected from each of the
24 following five types of health facilities: district health management teams, hospitals, clinics with
25 maternity services, clinics without maternity services, and health posts. When no facility was
26 available in a particular category, an additional facility was selected at random. If a district had
27 less than five facilities, all were chosen. The second stage of sampling was to select healthcare
28 workers. For each selected facility, employees were categorized according to four cadres: doctors
29 and nurses providing clinical care, administrative personnel (doctors and nurses acting in
30 administrative capacity, human resources staff, data clerks), other professionals (social workers,
31 pharmacists, nutritionists, allied health professionals including radiographers and pharmacist
32 technicians, paraprofessionals including lay counsellors and health education assistants), and
33 support staff (drivers, cleaners, gardeners). Four participants and two alternates were randomly
34 selected per cadre at each facility. If a facility had fewer than four employees in a cadre, all were
35 selected. One district had fewer than five facilities and many cadres had fewer than four people.
36 In total, surveys were distributed to 1,856 health workers in 134 facilities (32 clinics with
37 maternity, 29 clinics without maternity, 26 health posts, 26 DHMTs, and 21 health posts), which
38 represents 9.3% of the estimated 20,000 health workers in the country⁽²¹⁾. This sample size was
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3 calculated to provide a confidence level of 95% and confidence interval of 5% among the
4 smallest employee category (other professionals, n=4751) working at public health facilities.

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6 Surveys were administered by district WWP focal people. To ensure uniform
7 administration, these individuals received a one-week training including general research topics,
8 research ethics, the survey tool, and the distribution process. In rare cases where a participant had
9 limited literacy and/or English skills, focal people supported completion of the survey.
10 Participants completed the questionnaire, sealed it in an envelope, and returned it to the district
11 WWP focal person. Envelopes were sent through government transport, post, or courier to the
12 research team in Gaborone.
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20 *Questionnaire*

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22 The self-administered questionnaire consisted of quantitative, closed-ended questions
23 assessing demographics (age, gender, marital status, children, education, employment cadre, type
24 of facility, length of time in healthcare, length of time working at current facility, citizenship). It
25 also assessed participation in WWP activities, job satisfaction, stress level, well-being, burnout,
26 and sources of stress.
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31 Participation in WWP services was assessed using a question about each of the five
32 activity types (health promotion, psychosocial and spiritual care, stress management and team
33 building, therapeutic recreation, occupational health and safety). The number of times an
34 individual had participated in each activity was assessed. Total number of activities was
35 calculated by averaging the midpoint number from each response category across the five
36 activity types.
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41 Job satisfaction was assessed using the abridged Job Descriptive Index (JDI)⁽²²⁾, a shorted
42 form of the JDI, both psychometrically well-validated tools⁽²³⁾ to measure satisfaction with work,
43 co-workers, compensation, promotion opportunity, and supervision. Respondents were asked to
44 think about each job facet and respond to six adjectives/short phrases with “yes”, “no”, or
45 “cannot decide.” Responses were summed using the recommended cleaning and scoring
46 procedures including eliminating “straight line responses”, dropping response with significant
47 missing data, and reverse-scoring negative phrases. The eight-item Job In General (JIG) scale
48 was used to measure overall job satisfaction and cleaned in the same fashion. Occupational stress
49 was assessed with the Stress in General scale⁽²⁴⁾, using the same format as the JDI and JIG.
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3 Psychological well-being was assessed with the General Health Questionnaire-12 (GHQ-
4 12), a psychometrically well-validated, widely used tool,⁽²⁵⁾ including in low-income settings.⁽²⁶⁾
5 The GHQ is comprised of twelve items such as “Have you recently been able to concentrate on
6 what you’re doing?” with responses on a 4-point Likert-type scale (not at all, no more than usual,
7 rather more than usual, much more than usual). Responses were summed using the author-
8 recommended 0/0/1/1 scoring.
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13 Burnout was assessed using the sixteen-item Maslach Burnout Inventory-General Survey
14 (MBI-GS), developed over 25 years ago⁽²⁷⁾ show to have strong psychometric properties across
15 settings and occupations⁽²⁸⁻³⁰⁾. The GS version focuses on staff not providing direct human
16 services and measures three subscales of exhaustion, cynicism, and professional efficiency using
17 five or six items each.
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22 Sources of stress were measured using an investigator-adapted instrument from the 2006
23 Botswana Healthcare Worker Survey asking participants to rate whether 10 topics were sources
24 of work-related stress on a 5 point Likert scale (Strong Agree, Agree, Not Sure, Disagree,
25 Strongly Disagree). A response of “Strongly Agree” or “Agree” was used to indicate stress.
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30 31 *Statistics*

32 Data were entered in a database developed using REDcap,⁽³¹⁾ a secure web-based
33 application. Data were exported to STATA version 14.2 for analysis. Participants who did not
34 respond to questions on WWP participation were removed from analysis. Descriptive statistics
35 were generated to characterize the respondents’ demographics, participation in WWP activities,
36 and psychosocial measures. Respondents were categorized into three WWP participation groups
37 based on number of activities completed in the past year: 0 activities, 1-6 activities, or 7+
38 activities. Associations between demographics and WWP program participation as well as
39 psychosocial factors and WWP participation were analyzed with chi-squared (categorical) and
40 ANOVA models (continuous). For psychosocial factors found to be associated with WWP
41 participation, ANCOVA models were built, controlling for associated demographics. Post-hoc
42 pairwise comparisons were conducted using the Bonferroni method. No sensitivity analyses were
43 conducted.
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56 *Ethics Approval*

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3 The evaluation was approved by the MOH Health Research and Development Committee
4 Reference #PPME: 13/18/1 Vol VIII (434) and non-research determination was received by the
5 University of Washington's Internal Review Board Application #45194EJ. It was conducted by
6 the International Training and Education Center for Health (I- TECH), which is a collaboration
7 between the University of Washington and University of California, San Francisco under the
8 guidance of a reference group comprised of healthcare stakeholders. The reference group
9 included representation from the Botswana Ministry of Health Departments of Corporate
10 Services, HIV/AIDS Prevention and Care, Clinical Services, and Public Health; the Seventh Day
11 Adventist Mission Hospital in Kanye; Directorate of Public Service Management, Office of the
12 President; the World Health Organization; and CDC Botswana.
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23 Results

24 Of the 1,856 forms distributed, questionnaires were completed and returned by 1,348
25 health workers, a response rate of 73%. There were 30 respondents who did not answer questions
26 on WWP participation and were removed from the analyses. Nearly two-thirds of respondents
27 were female (62.4%) and similar amounts were not married (65.2%) [Table 1]. Of respondents,
28 2.9% were doctors, 29.2% were nurses, 27.4% were other professionals, 10.4% were
29 administrative, and 27.2% were support staff. The mean age was 40.0 years (SD±9.9). About
30 half worked in hospitals (26.9%) or clinics with maternity (24.9%). Participants were split into
31 roughly thirds of those who in the last year had participated in 0 WWP activities (n= 387,
32 29.4%), 1-6 activities (n=513, 38.9%), and 7 or more activities (n=418, 31.7%). Among those
33 who had participated in 7 or more activities in the past year, psychosocial and spiritual care
34 activities were the best attended, with 13.6% of participants attending 7 or more in the last year,
35 while only 2.8% of participants had attended the same quantity of Occupational Health and
36 Safety (OHSA) activities. High participation in WWP activities was associated with older age,
37 working longer in health services, working longer at a facility, being a doctor or other
38 professional staff, and being posted at hospitals and the District Health Management Teams
39 (DHMT). The strongest association was seen with facility type.
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52 In unadjusted analyses, overall job satisfaction assessed by the JIG was significantly
53 higher for health workers that participated in seven or more WWP activities, as compared to
54 those who did not participate in any WWP activities (p<0.001). There were similar findings with
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3 the JDI subscales related to satisfaction with work, supervision, promotion opportunities, and
4 pay, with the highest levels found among those participating in seven or more WWP activities
5 (all $p \leq 0.005$). Psychological well-being measured by the GHQ-12 did not differ significantly by
6 level of WWP participation. However, levels of stress from the SIG as well as measures of
7 exhaustion and cynicism from the MBI were significantly lower among those with high
8 participation in WWP activities. All associations remained the same in analyses controlled for
9 age, cadre, and facility type, except for the MBI subscale of cynicism, which became non-
10 significant. Post-hoc analyses of differences between groups are presented in Table 2.

11
12 The three most commonly reported sources of stress were shortages of staff (78.0%),
13 insufficient resources & supplies (76.7%) and too much work (72.7%) [Table 3]. Compared to
14 the 2006 survey, fewer participants in 2014 indicated each category was a source of stress. The
15 only exception was for “non-supportive supervisors” which saw a slight increase from 58% in
16 2006 to 59.5% in 2013.

27 Discussion

28
29 Data from this nationally representative survey of health workers in Botswana found that
30 participation in workplace wellness activities was associated with higher levels of job
31 satisfaction and professional efficacy. Participation in workplace wellness activities was also
32 associated with lower levels of stress and exhaustion. To the authors’ knowledge, this is the first
33 report of the effectiveness of a national workplace health promotion initiative for public health
34 workers in middle- or low-income countries. Health workers were more likely to participate in
35 WWP activities if they were of older age, worked longer in health services, worked longer at a
36 facility, were a doctor or other professional staff, or were posted at hospitals and the DHMT.
37 This last, and strongest association was possibly due to greater access to activities at these sites.

38
39 While there is a large body of literature on health promotion activities in high-income
40 countries, workplace health promotion programs in middle or low-income countries have been
41 reported less frequently^(12, 19, 32), particularly in health care settings.⁽³³⁾ Much of the existing
42 research comes from the Healthy Company Index, which was developed by a large health insurer
43 in South Africa to promote healthy lifestyles among insurees.⁽¹⁶⁻¹⁹⁾ Data from this program
44 indicate workplace wellness programs are associated with employee health. Specifically,

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3 employees at companies providing health promotion facilities are more likely to meet the
4 guidelines for physical activity and daily consumption of fruits and vegetables.⁽¹⁷⁾

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6 Related research shows leadership support of workplace wellness programs influences
7 the provision of health promotion facilities and policies, resulting in higher employee wellbeing
8 and increased perceived organizational commitment to wellbeing.⁽¹⁸⁾ The authors argue that the
9 based upon the Social Exchange Theory (SET)⁽³⁴⁾ workplace wellness programs may have
10 benefits beyond created by their direct use. Even employees who do not participate in the
11 programs may still benefit through the perception that the organization they work cares about
12 their health. The importance of enacting such programs and policies is an important implication
13 for policymakers charged with caring for the public health workforce.

14
15 The data on sources of stress can be directly compared to the 2006 survey conducted
16 before the implementation of the WWP program. In the recent study, fewer respondents reported
17 providing care for HIV/AIDS (42% vs 76%), caring for many patients (49.0% vs. 85%), too
18 much work (72.7% vs. 88%), and staff shortages (78% vs. 91%) as a source of stress.⁽³⁵⁾ These
19 results are encouraging, as they suggest there have been improvements in reducing workplace
20 stress. However it is unclear what these changes are attributable to, including increased
21 familiarity with HIV/AIDS, more straightforward treatment regimens, programs like WWP,
22 increased human resources in the health field, or other changes.

23
24 These conclusions must be interpreted within the context of this study design. As a cross-
25 sectional survey, it is impossible to determine the direction of causality. Participation in
26 workplace wellness activities may have increased feelings of job satisfaction and efficacy and
27 decreased stress and burnout. However it is equally plausible that individuals who felt more
28 satisfied and efficacious and less stressed and burnt-out were more likely to participate in
29 workplace wellness activities. Strengths of this study include a multilevel random sampling
30 methodology, use of previously validated scales, and a relatively high response rate (73%).

31
32 The health systems of middle- and low-income countries are facing a particularly
33 important and challenging time. There has been marked progress towards key international
34 initiatives including the UNDP sustainable development goals, the UNAIDS 90-90-90 HIV
35 treatment goals, and the WHO initiatives for the elimination of mother to child transmission of
36 HIV and syphilis. However, achievement of these ambitious goals requires intensified efforts.
37 This can create tense environments for healthcare workers, leading high levels of stress, burnout,
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3 and job dissatisfaction. This study has highlighted workplace wellness programs as a potential
4 avenue to support these vital staff. Further, it is possible that providing these types of activities
5 may facilitate higher job satisfaction and lower levels of stress and burnout. Further, SET
6 reinforces the implications of having such programs formally codified as organizational policy.
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8 Piloting of similar programs in similar strained healthcare systems could be extremely helpful in
9 the attainment of key international public health and development goals.
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Table 1. Demographic characteristics and WWP participation in the past year of 1,318 WWP national survey participants
WWP Participation in Last Year

Characteristic	Total		0 Activities		1-6 Activities		7+ Activities		p-value ^s
	%	n=1,318 [#]	%	n=387 [#]	%	n=513 [#]	%	n=418 [#]	
Age (years)*		39.9 ±9.9		39.9 ±10.1		39.2 ±9.6		40.9 ±10.1	0.027
Gender									
Female	62.2	820	66.7	258	60.6	311	60.0	251	0.116
Male	37.5	494	33.3	129	38.8	199	39.7	166	
Marital Status									
Not Married	65.2	859	65.6	254	66.9	343	62.7	262	
Married	33.8	445	33.1	128	32.2	165	36.4	152	0.364
Number of Children									
0	16.2	213	17.6	68	17.5	90	13.2	55	0.407
1-2	47.7	629	47.0	182	47.4	243	48.8	204	
3-4	27.6	364	28.9	112	26.3	135	28.0	117	
5+	7.2	95	5.9	23	7.0	36	8.6	36	
Highest Education Completed									
Less than High School	30.5	402	30.0	116	27.7	142	34.4	144	0.292
Senior Secondary School	16.0	211	15.2	59	17.2	88	15.3	64	
More than High School	50.5	666	50.6	196	52.4	269	48.1	201	
Botswana Citizen	93.8	1,236	95.6	370	93.4	479	92.6	387	0.341
Years worked in Health Services*		11.9 ±9.0		11.7 ±8.7		11.2 ±8.7		12.9 ±9.4	0.014
Years worked in Facility*		3.1 ±1.3		2.9 ±1.3		3.1 ±1.3		3.2 ±1.3	0.001
Cadre									
Doctor	2.9	38	2.1	8	2.9	15	3.6	15	0.001
Nurse	29.2	385	35.1	136	29.6	152	23.2	97	
Other Professional	27.4	361	21.4	83	28.3	145	31.8	133	
Administrative	10.4	137	10.3	40	12.3	63	8.1	34	
Support	27.2	358	27.9	108	23.8	122	30.6	128	
Facility Type									
Hospital	26.8	353	17.6	68	29.8	153	31.6	132	<0.001
Clinic with maternity	24.8	327	30.7	119	24.8	127	19.4	81	
District Health Management Team	19.9	262	15.2	59	19.3	99	24.9	104	
Clinic without maternity	17.6	232	24.0	93	15.0	77	14.8	62	
Health Post	8.8	116	10.3	40	8.6	44	7.7	32	
WWP Activity Participation* (n)									
Health Promotion	1,290	1.8 ±2.9		0		1.4 ±1.3		4.0 ±4.0	
Psychosocial and Spiritual Care	1,281	2.2 ±3.9		0		0.7 ±1.2		6.0 ±5.0	
Stress Management and Team Building	1,298	0.9 ±2.2		0		0.4 ±0.8		2.4 ±3.3	

Therapeutic Recreation	1,278	0.9 ±2.5	0	0.4 ±0.8	2.5 ±3.8
Occupational Health and Safety	1,288	0.7 ±2.0	0	0.4 ±0.8	1.9 ±3.2

* mean ±SD

N(%) may not equal total due to missing data or rounding. %s are calculated using missing data

\$ p-value calculated from chi-square test for categorical variables and ANOVA for continuous variables

Table 2. Association of job satisfaction, stress, well-being, and burnout with WWP participation in the past year among 1,291 WWP national survey participants

	WWP Participation in the Last Year						
	Overall		0 Activities	1-6 Activities	7+ Activities	p-value (unadjusted)	p-value (adjusted)
	n=1,291	Mean ±SD	n=376	n=503	n=412		
Job In General	1,012	15.0 ±6.8	13.9 ±7.4 ^a	14.7 ±6.5 ^{ab}	16.5 ±6.3 ^b	<0.001	0.004
Job Descriptive Index							
Co-workers	1,031	12.2 ±6.0	12.0 ±6.0	12.3 ±5.9	12.3 ±6.0	0.759	0.703
Work in present job	1,027	10.3 ±5.6	9.1 ±5.8 ^a	10.1 ±5.6 ^{ab}	11.6 ±5.4 ^b	<0.001	<0.001
Supervision	989	10.3 ±5.8	9.6 ±6.1 ^a	10.0 ±5.7 ^{ab}	11.4 ±5.6 ^b	<0.001	0.043
Opportunities for promotion	986	5.9 ±5.0	5.0 ±4.7 ^a	6.0 ±4.9 ^b	6.6 ±5.2 ^b	<0.001	0.003
Pay	1,023	4.4 ±4.6	3.9 ±4.6 ^a	4.2 ±4.3 ^{ab}	5.1 ±5.0 ^b	0.005	0.007
Stress in General	970	12.9 ±7.7	14.1 ±8.0 ^a	13.1 ±7.6 ^{ab}	11.7 ±7.4 ^b	<0.001	0.006
General Health Questionnaire	1,278	4.0 ±2.6	4.2 ±2.7	4.1 ±2.7	3.8 ±2.4	0.138	0.307
Maslach Burnout Inventory							
Professional Efficacy	1,257	4.9 ±1.1	4.9 ±1.1 ^a	4.9 ±1.1 ^a	5.1 ±0.9 ^b	0.043	0.017
Exhaustion	1,260	2.3 ±1.7	2.6 ±1.8 ^a	2.3 ±1.7 ^b	2.0 ±1.5 ^b	<0.001	<0.001
Cynicism	1,246	2.4 ±1.4	2.5 ±1.4	2.4 ±1.4	2.2 ±1.4	0.022	0.418

All outcome variables were continuous and tested with one-way ANOVAs. Adjusted analyses used ANCOVAs, controlling for age (continuous), cadre (5 levels), and facility type (5 levels). Mean values with different superscript letters are significantly different using Bonferroni pairwise comparisons.

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Table 3. Comparison of sources of stress between participants in the 2013 WWP national survey and 2006 healthcare worker survey

Sources of Stress (Agree/Strongly Agree)	2013		2006	
	%	(n=1,313)	%	(n=223)
Shortage of staff	78.0	1,051	91	201
Insufficient resources and supplies	76.7	1,034	-	-
Too much work	72.7	980	88	196
Not being appreciated for the work I do	64.1	864	76	169
Non-supportive supervisors	59.5	802	58	129
Balancing demands of work and family	51.3	691	-	-
Providing care for many patients	49.0	660	85	190
Providing care for many HIV/AIDS patients	42.3	570	76	169
Providing support for relatives of patients	41.3	557	55	123
Conflict with co-workers	39.7	535	-	-

For Peer review only

Authors' contributions

JL and NJK prepared the first draft; JL, NJK, MM, HM, SM, BS, GO reviewed the manuscript and provided comments; JL and NJK finalized the report based on feedback from other authors; JL and NJK analyzed and interpreted the data; JL, MM, HM, SM, BS, GO helped provide overall guidance to the conduct of the study; and JL, MM, HM, SM, BS, GO were involved in the origination and development of the concept of the study.

Data Sharing Statement

Extra data is available by emailing Dr. Ledikwe @ ledikwe@uw.edu

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

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract p1 (b) Provide in the abstract an informative and balanced summary of what was done and what was found p2
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported p3
Objectives	3	State specific objectives, including any prespecified hypotheses p4
Methods		
Study design	4	Present key elements of study design early in the paper p4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection p4
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants p4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable p5-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group p5-6
Bias	9	Describe any efforts to address potential sources of bias p6
Study size	10	Explain how the study size was arrived at p4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why p6
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding p6 (b) Describe any methods used to examine subgroups and interactions p6 (c) Explain how missing data were addressed p6 (d) If applicable, describe analytical methods taking account of sampling strategy NA (e) Describe any sensitivity analyses p6
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed p7 (b) Give reasons for non-participation at each stage p7 (c) Consider use of a flow diagram NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders p7 & Table 1 on p10 (b) Indicate number of participants with missing data for each variable of interest Table 1 on p10
Outcome data	15*	Report numbers of outcome events or summary measures p7-8
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included p7-8

		(b) Report category boundaries when continuous variables were categorized NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses p8
Discussion		
Key results	18	Summarise key results with reference to study objectives p8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias p9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence p8-9
Generalisability	21	Discuss the generalisability (external validity) of the study results p9
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based p13

*Give information separately for exposed and unexposed groups.

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

BMJ Open

Associations between Healthcare Worker Participation in Workplace Wellness Activities and Job Satisfaction, Occupational Stress, and Burnout: A Cross-Sectional Study in Botswana

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Keywords:	workplace wellness, stress, job satisfaction, HIV/AIDS care, Botswana

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Title: Associations between Healthcare Worker Participation in Workplace Wellness Activities and Job Satisfaction, Occupational Stress, and Burnout: A Cross-Sectional Study in Botswana

Running title: Association Wellness Activities Job Satisfaction, Stress, Burnout

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Abstract

Objectives

Healthcare workers (HWs) are prone to high levels of stress and burnout, particularly when caring for people with HIV/AIDS. This study assessed whether participation in Botswana's Workplace Wellness Program for HWs (WWP) was associated with job satisfaction, occupational stress, well-being, and burnout.

Methods

Using multi-stage sampling, a paper-based questionnaire was distributed to 1,856 randomly selected HWs at 135 public facilities across Botswana. Well-validated scales assessed key outcomes. ANCOVA models were built for psychosocial factors associated with WWP participation, controlling for associated demographics.

Results

Response rate was 73% (n=1,348). The majority of respondents were female (62%), not married (65%) and had children (84%). Mean age was 40.0 years (SD±9.9). Respondents were roughly split between participation in 0 WWP activities (29.4%), 1-6 WWP activities (38.9%), and 7 or more WWP activities (31.7%) in the past year. High participation was associated with older age, being a doctor or other professional, working at hospitals or District Health Management Teams, working longer in health services, or working longer at a facility. In unadjusted analyses, high participation was significantly associated ($p<0.05$) with higher satisfaction with overall job, work, supervision, promotion, pay, and professional efficacy; and lower stress, exhaustion, and cynicism. All associations remained significant in controlled analyses except cynicism.

Conclusions

Results from this study suggest participation in workplace wellness activities is associated with higher satisfaction with multiple job facets and lower stress, exhaustion, and cynicism. Introduction of these activities may help ameliorate high occupational stress levels among HWs.

Article Summary. Strengths and limitations of this study:

- Strengths include a multilevel random sampling methodology and use of previously validated scales.
- The survey had a relatively high response rate (73%).
- Limitations include an inability to determine the direction of causality due to the cross-sectional nature of the survey.

Introduction

Healthcare professionals are prone to high levels of occupational stress. When stress is experienced chronically, it results in burnout, an exhaustion of physical and emotional resources⁽¹⁾. This is due to long hours and the emotional weight of treating sick patients⁽²⁾ and is especially common among providers who work with People Living with HIV/AIDS (PLHA)⁽³⁾. In the early years of the HIV epidemic, the stress was primarily due to stigma around the disease, lack of understanding of transmission and treatment, and the extremely high mortality rate.⁽⁴⁾ The introduction of highly active antiretroviral therapy (HAART) and increased community and clinical HIV knowledge has lessened stress on providers. However, many providers still experience stress from the emotional toll of caring for sick patients, workplace demands, lack of supervision, unresolved grief, feelings of helplessness and ineffectiveness, and an absence of gratitude from individuals and communities.^(4, 5) Accordingly to the Maslach Burnout Model, this persistent stress eventually results in burnout, comprised of “overwhelming” exhaustion, cynicism, and a sense of ineffectiveness⁽¹⁾.

In sub-Saharan Africa, high demand for services and insufficient resources are still commonplace, resulting in tense environments for health workers involved in HIV treatment, care, and support. This situation may be compound by the new Joint United Nations Programme on HIV/AIDS (UNAIDS) targets of having 90% of PLHA know their status, 90% of people who know they have HIV on ARV treatment, and 90% of PLHA on treatment virally suppressed.⁽⁶⁾

Botswana, with an 18.5% prevalence rate, has been one of the countries most affected by the HIV epidemic.⁽⁷⁾ A survey conducted in 2006 indicated there were high levels of stress and burnout among health workers in Botswana, due in part to the rising burden of HIV/AIDS patients and the related pressure on the healthcare system.⁽⁸⁾ In response, the Botswana Ministry of Health (MOH) began implementing a comprehensive Workplace Wellness Program (WWP) for healthcare workers in 2007.⁽⁹⁾ This initiative aimed to improve health and well-being and reduce stress among health workers in government facilities by empowering them with knowledge and skills to manage the dynamic demands of the health care system.⁽⁸⁾ WWP implementation has been described previously.⁽¹⁰⁾ Briefly, the program focused on holistic improvements in health and well-being through activities focusing on: health screening, treatment, and care; health promotion; stress management and team building; occupational health and safety; psychosocial and spiritual care; and therapeutic recreation.

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3 Data from high-income settings suggest that workplace wellness programs can have
4 numerous benefits, including lowered healthcare costs, reduced absenteeism, increased
5 productivity, and positive economic impact.⁽¹¹⁻¹⁵⁾ However the situation is different in less
6 resourced countries, with higher reported levels of anxiety, depression, and health risks⁽¹⁶⁾ and
7 lower nutritional habits and physical activity⁽¹⁷⁾. Thus, little is known about the effectiveness of
8 workplace wellness programs when implemented to improve occupational health among health
9 workers in these settings, outside of a few studies in South Africa.⁽¹⁸⁻²¹⁾ Therefore, a nationally
10 representative survey of health workers in Botswana was conducted to determine if there were
11 associations between participation in WWP activities with individuals' levels of job satisfaction,
12 psychological well-being, burnout, and sources of stress.
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21 **Methods**

22 This was a cross-sectional survey of staff employed at public health facilities in
23 Botswana. Individuals had to be employed in a selected public health facility to be eligible to
24 participate. A self-administered questionnaire was distributed to randomly selected health
25 workers in public health facilities using multi-stage sampling. The first sampling stage was to
26 select the health facilities, using a random number generator to select five facilities in each of
27 Botswana's 27 health districts. For each district, one facility was selected from each of the
28 following five types of health facilities: district health management teams, hospitals, clinics with
29 maternity services, clinics without maternity services, and health posts. When no facility was
30 available in a particular category, an additional facility was selected at random. If a district had
31 less than five facilities, all were chosen. The second stage of sampling was to select healthcare
32 workers. For each selected facility, employees were categorized according to four cadres: doctors
33 and nurses providing clinical care, administrative personnel (doctors and nurses acting in
34 administrative capacity, human resources staff, data clerks), other professionals (social workers,
35 pharmacists, nutritionists, allied health professionals including radiographers and pharmacist
36 technicians, paraprofessionals including lay counsellors and health education assistants), and
37 support staff (drivers, cleaners, gardeners). Four participants and two alternates were randomly
38 selected per cadre at each facility. If a facility had fewer than four employees in a cadre, all were
39 selected. One district had fewer than five facilities and many cadres had fewer than four people.
40 In total, surveys were distributed to 1,856 health workers in 134 facilities (32 clinics with
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3 maternity, 29 clinics without maternity, 26 health posts, 26 DHMTs, and 21 health posts), which
4 represents 9.3% of the estimated 20,000 health workers in the country⁽²²⁾. This sample size was
5 calculated to provide a confidence level of 95% and confidence interval of 5% among the
6 smallest employee category (other professionals, n=4751) working at public health facilities.
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10 Surveys were administered by district WWP focal people. To ensure uniform
11 administration, these individuals received a one-week training including general research topics,
12 research ethics, the survey tool, and the distribution process. In rare cases where a participant had
13 limited literacy and/or English skills, focal people supported completion of the survey.
14 Participants completed the questionnaire, sealed it in an envelope, and returned it to the district
15 WWP focal person. Envelopes were sent through government transport, post, or courier to the
16 research team in Gaborone.
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24 *Questionnaire*

25 The self-administered questionnaire consisted of quantitative, closed-ended questions
26 assessing demographics (age, gender, marital status, children, education, employment cadre, type
27 of facility, length of time in healthcare, length of time working at current facility, citizenship). It
28 also assessed participation in WWP activities, job satisfaction, stress level, well-being, burnout,
29 and sources of stress.
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34 Participation in WWP services was assessed using a question about each of the five
35 activity types (health promotion, psychosocial and spiritual care, stress management and team
36 building, therapeutic recreation, occupational health and safety). The number of times an
37 individual had participated in each activity was assessed. Total number of activities was
38 calculated by averaging the midpoint number from each response category across the five
39 activity types.
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44 Job satisfaction was assessed using the abridged Job Descriptive Index (JDI)⁽²³⁾, a
45 shortened form of the JDI, both psychometrically well-validated tools⁽²⁴⁾ to measure satisfaction
46 with work, co-workers, compensation, promotion opportunity, and supervision. Respondents
47 were asked to think about each job facet and respond to six adjectives/short phrases with “yes”,
48 “no”, or “cannot decide.” Responses were summed using the recommended cleaning and scoring
49 procedures including eliminating “straight line responses”, dropping response with significant
50 missing data, and reverse-scoring negative phrases. The eight-item Job In General (JIG) scale
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3 was used to measure overall job satisfaction and cleaned in the same fashion. Occupational stress
4 was assessed with the Stress in General scale⁽²⁵⁾, using the same format as the JDI and JIG.
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7 Psychological well-being was assessed with the General Health Questionnaire-12 (GHQ-
8 12), a psychometrically well-validated, widely used tool,⁽²⁶⁾ including in low-income settings.⁽²⁷⁾
9 The GHQ is comprised of twelve items such as “Have you recently been able to concentrate on
10 what you’re doing?” with responses on a 4-point Likert-type scale (not at all, no more than usual,
11 rather more than usual, much more than usual). Responses were summed using the author-
12 recommended 0/0/1/1 scoring.
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17 Burnout was assessed using the sixteen-item Maslach Burnout Inventory-General Survey
18 (MBI-GS), developed over 25 years ago⁽²⁸⁾ show to have strong psychometric properties across
19 settings and occupations⁽²⁹⁻³¹⁾. The GS version focuses on staff not providing direct human
20 services and measures three subscales of exhaustion, cynicism, and professional efficiency using
21 five or six items each.
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26 Sources of stress were measured using an investigator-adapted instrument from the 2006
27 Botswana Healthcare Worker Survey asking participants to rate whether 10 topics were sources
28 of work-related stress on a 5 point Likert scale (Strong Agree, Agree, Not Sure, Disagree,
29 Strongly Disagree). A response of “Strongly Agree” or “Agree” was used to indicate stress.
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33 34 *Statistics* 35

36 Data were entered and managed using REDcap electronic data capture tools hosted at
37 University of Washington.⁽³²⁾ REDCap (Research Electronic Data Capture) is a secure, web-
38 based application designed to support data capture for research studies, providing an intuitive
39 interface for validated data entry; audit trails for tracking data manipulation and export
40 procedures; automated export procedures for seamless data downloads to common statistical
41 packages; and procedures for importing data from external sources. Data were exported to
42 STATA version 14.2 for analysis.
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48 Participants who did not respond to questions on WWP participation were removed from
49 analysis. Descriptive statistics were generated to characterize the respondents’ demographics,
50 participation in WWP activities, and psychosocial measures. Respondents were categorized into
51 three WWP participation groups based on number of activities completed in the past year: 0
52 activities, 1-6 activities, or 7+ activities. Associations between demographics and WWP program
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3 participation as well as psychosocial factors and WWP participation were analysed with chi-
4 squared (categorical) and ANOVA models (continuous). For psychosocial factors found to be
5 associated with WWP participation, ANCOVA models were built, controlling for associated
6 demographics. Post-hoc pairwise comparisons were conducted using the Bonferroni method. No
7 sensitivity analyses were conducted.
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14 *Ethics Approval*

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16 The evaluation was approved by the MOH Health Research and Development Committee
17 Reference #PPME: 13/18/1 Vol VIII (434) and non-research determination was received by the
18 University of Washington's Internal Review Board Application #45194EJ. It was conducted by
19 the International Training and Education Center for Health (I- TECH), which is a collaboration
20 between the University of Washington and University of California, San Francisco under the
21 guidance of a reference group of healthcare stakeholders which included representation from the
22 Botswana Ministry of Health Departments of Corporate Services, HIV/AIDS Prevention and
23 Care, Clinical Services, and Public Health; the Seventh Day Adventist Mission Hospital in
24 Kanye; Directorate of Public Service Management, Office of the President; the World Health
25 Organization; and CDC Botswana.
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37 **Results**

38 Of the 1,856 forms distributed, questionnaires were completed and returned by 1,348
39 health workers, a response rate of 73%. There were 30 respondents who did not answer questions
40 on WWP participation and were removed from the analyses. Nearly two-thirds of respondents
41 were female (62.4%) and similar amounts were not married (65.2%) [Table 1]. Of respondents,
42 2.9% were doctors, 29.2% were nurses, 27.4% were other professionals, 10.4% were
43 administrative, and 27.2% were support staff. The mean age was 40.0 years (SD±9.9). About
44 half worked in hospitals (26.9%) or clinics with maternity (24.9%).
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50 Participants were split into roughly thirds of those who in the last year had participated in
51 0 WWP activities (n= 387, 29.4%), 1-6 activities (n=513, 38.9%), and 7 or more activities
52 (n=418, 31.7%). Among those who had participated in 7 or more activities in the past year,
53 psychosocial and spiritual care activities were the best attended, with 13.6% of participants
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3 attending 7 or more in the last year, while only 2.8% of participants had attended the same
4 quantity of Occupational Health and Safety (OHS) activities.

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6 High participation in WWP activities was associated with older age, working longer in
7 health services, working longer at a facility, being a doctor or other professional staff, and being
8 posted at hospitals and the District Health Management Teams (DHMT). The strongest
9 association was seen with facility type.

10
11 In unadjusted analyses, overall job satisfaction assessed by the JIG was significantly
12 higher for health workers that participated in seven or more WWP activities, as compared to
13 those who did not participate in any WWP activities ($p < 0.001$). There were similar findings with
14 the JDI subscales related to satisfaction with work, supervision, promotion opportunities, and
15 pay, with the highest levels found among those participating in seven or more WWP activities
16 (all $p \leq 0.005$). Psychological well-being measured by the GHQ-12 did not differ significantly by
17 level of WWP participation. However, levels of stress from the SIG as well as measures of
18 exhaustion and cynicism from the MBI were significantly lower among those with high
19 participation in WWP activities. All associations remained the same in analyses controlled for
20 age, cadre, and facility type, except for the MBI subscale of cynicism, which became non-
21 significant. Post-hoc analyses of differences between groups are presented in Table 2.

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23 The three most commonly reported sources of stress were shortages of staff (78.0%),
24 insufficient resources & supplies (76.7%) and too much work (72.7%) [Table 3]. Compared to
25 the 2006 survey, fewer participants in 2014 indicated each category was a source of stress. The
26 only exception was for “non-supportive supervisors” which saw a slight increase from 58% in
27 2006 to 59.5% in 2013.

28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 **Discussion**

43
44 Data from this nationally representative survey of health workers in Botswana found that
45 participation in workplace wellness activities was associated with higher levels of job
46 satisfaction and professional efficacy. Participation in workplace wellness activities was also
47 associated with lower levels of stress and exhaustion. To the authors' knowledge, this is the first
48 report of the effectiveness of a national workplace health promotion initiative for public health
49 workers in middle- or low-income countries. Health workers were more likely to participate in
50 WWP activities if they were of older age, worked longer in health services, worked longer at a
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3 facility, were a doctor or other professional staff, or were posted at hospitals and the DHMT.
4 This last, and strongest association was possibly due to greater access to activities at these sites.
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6 While there is a large body of literature on health promotion activities in high-income
7 countries, workplace health promotion programs in middle or low-income countries have been
8 reported less frequently^(13, 20, 33), particularly in health care settings.⁽³⁴⁾ Much of the existing
9 research comes from the Healthy Company Index, which was developed by a large health insurer
10 in South Africa to promote healthy lifestyles among insurees.⁽¹⁷⁻²⁰⁾ Data from this program
11 indicate workplace wellness programs are positively associated with employee health.
12 Specifically, employees at companies providing health promotion facilities are more likely to
13 meet the guidelines for physical activity and daily consumption of fruits and vegetables.⁽¹⁸⁾ The
14 Maslach Burnout Model indicates that burnout is a result of chronic stress⁽¹⁾, however a recent
15 literature review indicates the interplay between workplace stress, burnout, job satisfaction, and
16 general health is not well understood.⁽³⁵⁾ Thus the mechanism by which workplace wellness
17 programs may improve wellbeing is unclear.
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27 Additional research from the Healthy Company Index shows leadership support of
28 workplace wellness programs influences the provision of health promotion facilities and policies,
29 resulting in higher employee wellbeing and increased perceived organizational commitment to
30 wellbeing.⁽¹⁹⁾ The authors argue based upon Social Exchange Theory (SET)⁽³⁶⁾, workplace
31 wellness programs may have benefits beyond those created by their direct use. Even employees
32 who do not participate in the programs may still benefit through the perception that the
33 organization they work cares about their health. The importance of enacting such programs and
34 policies is an important implication for policymakers charged with caring for the public health
35 workforce.
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43 The data on sources of stress can be directly compared to the 2006 survey conducted
44 before the implementation of the WWP program. In the recent study, fewer respondents reported
45 providing care for HIV/AIDS (42% vs 76%), caring for many patients (49.0% vs. 85%), too
46 much work (72.7% vs. 88%), and staff shortages (78% vs. 91%) as a source of stress.⁽³⁷⁾ These
47 results are encouraging, as they suggest there have been improvements in reducing workplace
48 stress. However it is unclear what these changes are attributable to, including increased
49 familiarity with HIV/AIDS, more straightforward treatment regimens, programs like WWP,
50 increased human resources in the health field, or other changes. In addition, the continuing high
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3 level of staff shortages and slight rise in non-supportive supervisors (59.5% vs. 58%) is notable,
4 as other research in the region highlights that stress related to staff issues may be a key factor for
5 burnout among healthcare professionals.⁽³⁸⁾
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8 These conclusions must be interpreted within the context of this study design. As a cross-
9 sectional survey, it is impossible to determine the direction of causality. Participation in
10 workplace wellness activities may have increased feelings of job satisfaction and efficacy and
11 decreased stress and burnout. However it is equally plausible that individuals who felt more
12 satisfied and efficacious and less stressed and burnt-out were more likely to participate in
13 workplace wellness activities. Strengths of this study include a multilevel random sampling
14 methodology, use of previously validated scales, and a relatively high response rate (73%).
15 Given the representative nature of the study, the results are likely generalizable to public health
16 workforces in other low- and middle- income countries.
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24 The health systems of middle- and low-income countries are facing a particularly
25 important and challenging time. There has been marked progress towards key international
26 initiatives including the UNDP sustainable development goals, the UNAIDS 90-90-90 HIV
27 treatment goals, and the WHO initiatives for the elimination of mother to child transmission of
28 HIV and syphilis. However, achievement of these ambitious goals requires intensified efforts.
29 This can create tense environments for healthcare workers, leading high levels of stress, burnout,
30 and job dissatisfaction. This study has highlighted workplace wellness programs as a potential
31 avenue to support these vital staff. Further, it is possible that providing these types of activities
32 may facilitate higher job satisfaction and lower levels of stress and burnout. Further, SET
33 reinforces the implications of having such programs formally codified as organizational policy.
34 Piloting of similar programs in similar strained healthcare systems could be extremely helpful in
35 the attainment of key international public health and development goals.
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Table 1. Demographic characteristics and WWP participation in the past year of 1,318 WWP national survey participants
WWP Participation in Last Year

Characteristic	Total		0 Activities		1-6 Activities		7+ Activities		p-value ^s
	%	n=1,318 [#]	%	n=387 [#]	%	n=513 [#]	%	n=418 [#]	
Age (years)*		39.9 ±9.9		39.9 ±10.1		39.2 ±9.6		40.9 ±10.1	0.027
Gender									
Female	62.2	820	66.7	258	60.6	311	60.0	251	0.116
Male	37.5	494	33.3	129	38.8	199	39.7	166	
Marital Status									
Not Married	65.2	859	65.6	254	66.9	343	62.7	262	0.364
Married	33.8	445	33.1	128	32.2	165	36.4	152	
Number of Children									
0	16.2	213	17.6	68	17.5	90	13.2	55	0.407
1-2	47.7	629	47.0	182	47.4	243	48.8	204	
3-4	27.6	364	28.9	112	26.3	135	28.0	117	
5+	7.2	95	5.9	23	7.0	36	8.6	36	
Highest Education Completed									
Less than High School	30.5	402	30.0	116	27.7	142	34.4	144	0.292
Senior Secondary School	16.0	211	15.2	59	17.2	88	15.3	64	
More than High School	50.5	666	50.6	196	52.4	269	48.1	201	
Botswana Citizen	93.8	1,236	95.6	370	93.4	479	92.6	387	0.341
Years worked in Health Services*		11.9 ±9.0		11.7 ±8.7		11.2 ±8.7		12.9 ±9.4	0.014
Years worked in Facility*		3.1 ±1.3		2.9 ±1.3		3.1 ±1.3		3.2 ±1.3	0.001
Cadre									
Doctor	2.9	38	2.1	8	2.9	15	3.6	15	0.001
Nurse	29.2	385	35.1	136	29.6	152	23.2	97	
Other Professional	27.4	361	21.4	83	28.3	145	31.8	133	
Administrative	10.4	137	10.3	40	12.3	63	8.1	34	
Support	27.2	358	27.9	108	23.8	122	30.6	128	
Facility Type									
Hospital	26.8	353	17.6	68	29.8	153	31.6	132	<0.001
Clinic with maternity	24.8	327	30.7	119	24.8	127	19.4	81	
District Health Management Team	19.9	262	15.2	59	19.3	99	24.9	104	
Clinic without maternity	17.6	232	24.0	93	15.0	77	14.8	62	
Health Post	8.8	116	10.3	40	8.6	44	7.7	32	
WWP Activity Participation*	(n)								
Health Promotion	1,290	1.8 ±2.9		0		1.4 ±1.3		4.0 ±4.0	
Psychosocial and Spiritual Care	1,281	2.2 ±3.9		0		0.7 ±1.2		6.0 ±5.0	
Stress Management and Team Building	1,298	0.9 ±2.2		0		0.4 ±0.8		2.4 ±3.3	

Therapeutic Recreation	1,278	0.9 ±2.5	0	0.4 ±0.8	2.5 ±3.8
Occupational Health and Safety	1,288	0.7 ±2.0	0	0.4 ±0.8	1.9 ±3.2

* mean ±SD

N(%) may not equal total due to missing data or rounding. %s are calculated using missing data

\$ p-value calculated from chi-square test for categorical variables and ANOVA for continuous variables

Table 2. Association of job satisfaction, stress, well-being, and burnout with WWP participation in the past year among 1,291 WWP national survey participants

	WWP Participation in the Last Year						
	Overall		0 Activities	1-6 Activities	7+ Activities	p-value (unadjusted)	p-value (adjusted)
	n=1,291	Mean ±SD	n=376	n=503	n=412		
Job In General	1,012	15.0 ±6.8	13.9 ±7.4 ^a	14.7 ±6.5 ^{ab}	16.5 ±6.3 ^b	<0.001	0.004
Job Descriptive Index							
Co-workers	1,031	12.2 ±6.0	12.0 ±6.0	12.3 ±5.9	12.3 ±6.0	0.759	0.703
Work in present job	1,027	10.3 ±5.6	9.1 ±5.8 ^a	10.1 ±5.6 ^{ab}	11.6 ±5.4 ^b	<0.001	<0.001
Supervision	989	10.3 ±5.8	9.6 ±6.1 ^a	10.0 ±5.7 ^{ab}	11.4 ±5.6 ^b	<0.001	0.043
Opportunities for promotion	986	5.9 ±5.0	5.0 ±4.7 ^a	6.0 ±4.9 ^b	6.6 ±5.2 ^b	<0.001	0.003
Pay	1,023	4.4 ±4.6	3.9 ±4.6 ^a	4.2 ±4.3 ^{ab}	5.1 ±5.0 ^b	0.005	0.007
Stress in General	970	12.9 ±7.7	14.1 ±8.0 ^a	13.1 ±7.6 ^{ab}	11.7 ±7.4 ^b	<0.001	0.006
General Health Questionnaire	1,278	4.0 ±2.6	4.2 ±2.7	4.1 ±2.7	3.8 ±2.4	0.138	0.307
Maslach Burnout Inventory							
Professional Efficacy	1,257	4.9 ±1.1	4.9 ±1.1 ^a	4.9 ±1.1 ^a	5.1 ±0.9 ^b	0.043	0.017
Exhaustion	1,260	2.3 ±1.7	2.6 ±1.8 ^a	2.3 ±1.7 ^b	2.0 ±1.5 ^b	<0.001	<0.001
Cynicism	1,246	2.4 ±1.4	2.5 ±1.4	2.4 ±1.4	2.2 ±1.4	0.022	0.418

All outcome variables were continuous and tested with one-way ANOVAs. Adjusted analyses used ANCOVAs, controlling for age (continuous), cadre (5 levels), and facility type (5 levels). Mean values with different superscript letters are significantly different using Bonferroni pairwise comparisons.

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Table 3. Comparison of sources of stress between participants in the 2013 WWP national survey and 2006 healthcare worker survey

Sources of Stress (Agree/Strongly Agree)	2013		2006	
	%	(n=1,313)	%	(n=223)
Shortage of staff	78.0	1,051	91	201
Insufficient resources and supplies	76.7	1,034	-	-
Too much work	72.7	980	88	196
Not being appreciated for the work I do	64.1	864	76	169
Non-supportive supervisors	59.5	802	58	129
Balancing demands of work and family	51.3	691	-	-
Providing care for many patients	49.0	660	85	190
Providing care for many HIV/AIDS patients	42.3	570	76	169
Providing support for relatives of patients	41.3	557	55	123
Conflict with co-workers	39.7	535	-	-

For Peer review only

Authors' contributions

JL and NJK prepared the first draft; JL, NJK, MM, HM, SM, BS, GO reviewed the manuscript and provided comments; JL and NJK finalized the report based on feedback from other authors; JL and NJK analyzed and interpreted the data; JL, MM, HM, SM, BS, GO helped provide overall guidance to the conduct of the study; and JL, MM, HM, SM, BS, GO were involved in the origination and development of the concept of the study.

Data Sharing Statement

Extra data is available by emailing Dr. Ledikwe @ ledikwe@uw.edu

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28 satisfaction and general health of nurses. *Int J Environ Res Public Health* 12(1): 652-666
29 (2015).
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STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract p1 (b) Provide in the abstract an informative and balanced summary of what was done and what was found p2
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported p3
Objectives	3	State specific objectives, including any prespecified hypotheses p4
Methods		
Study design	4	Present key elements of study design early in the paper p4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection p4
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants p4
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable p5-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group p5-6
Bias	9	Describe any efforts to address potential sources of bias p6
Study size	10	Explain how the study size was arrived at p4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why p6
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding p6 (b) Describe any methods used to examine subgroups and interactions p6 (c) Explain how missing data were addressed p6 (d) If applicable, describe analytical methods taking account of sampling strategy NA (e) Describe any sensitivity analyses p6
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed p7 (b) Give reasons for non-participation at each stage p7 (c) Consider use of a flow diagram NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders p7 & Table 1 on p10 (b) Indicate number of participants with missing data for each variable of interest Table 1 on p10
Outcome data	15*	Report numbers of outcome events or summary measures p7-8
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included p7-8

		(b) Report category boundaries when continuous variables were categorized NA
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses p8
Discussion		
Key results	18	Summarise key results with reference to study objectives p8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias p9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence p8-9
Generalisability	21	Discuss the generalisability (external validity) of the study results p9
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based p13

*Give information separately for exposed and unexposed groups.

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