



Published in final edited form as:

*East Afr J Public Health*. 2011 March ; 8(1): 17–24.

## STRESS, MOTIVATION, AND PROFESSIONAL SATISFACTION AMONG HEALTH CARE WORKERS IN HIV CARE AND TREATMENT CENTERS IN URBAN TANZANIA: A CROSS-SECTIONAL STUDY

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### Abstract

**Background**—Shortages of health care workers (HCWs) represents a serious challenge to ensuring effective HIV care in resource-limited settings (RLS). Stress, motivation, and job satisfaction have been linked with HCW retention and are important in addressing HCW shortages. In this cross-sectional study HCW stress, motivation, and perceived ability to meet patient needs were assessed in PEPFAR-supported urban HIV care and treatment clinics (CTCs) in Tanzania.

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**Competing interests** The authors declare that they have no competing interests in this study.

**Authors' contribution** There are two corresponding authors in this study, the rest contributed and approved the final manuscript.

**Methods**—A self-administered questionnaire measuring motivation, stress, and perceived ability to meet patient needs was given to HCWs at 16 CTCs. Scales measuring HCW satisfaction, motivation, and stress were developed using principle components analysis. Hierarchical linear models were used to explore the association of HCW and site characteristics with reported satisfaction, stress, motivation, and ability to meet patient needs.

**Results**—Seventy-three percent (279) of HCWs completed the questionnaire. Most (73%) HCWs reported minimal/no work-related stress, with 48% reporting good/excellent motivation, but 41% also reporting feeling emotionally drained. Almost all (98%) reported feeling able to help their patients, with 68% reporting work as rewarding. Most reported receipt of training and supervision, with good availability of resources. In the multivariate model, direct clinical providers reported lower motivation than management ( $p<0.05$ ) and HCWs at medium-sized sites reported higher motivation than HCWs at larger sites ( $p<0.05$ ). HCWs at small and medium sites were more likely to feel able to help patients than those from larger sites ( $p<0.05$  and  $p<0.001$  respectively).

**Conclusion**—Despite significant patient loads, HCWs in these PEPFAR-supported CTCs reported high levels of motivation, job satisfaction, ability to meet patient needs, low levels of stress but significant emotional toll. Understanding the relationship between support systems such as strong supervision and training and these outcomes is critical in designing interventions to improve motivation, reduce stress and increase retention of HCWs.

### Keywords

HIV; motivation; stress; health care workers; resource limited settings

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### Introduction

The shortage of health care workers (HCWs) worldwide is still a constraint to meeting global goals of health care for all [1], the Millennium Development Goals [3], and implementation of many priority health programs [3]. In 2006, the World Health Organization estimated a global shortage of 4.3 million HCWs, with the lowest provider-to-patient ratios in the poorest countries [4-5]. The recent rapid and widespread scale-up of HIV care and treatment programs in resource-limited settings (RLS) has only served to highlight this gap, especially in Sub-Saharan Africa where the estimates of people living with HIV is 22 million and many are still in need of antiretroviral therapy (ART)[6-9].

In sub-Saharan Africa, the shortage of HCWs has resulted from the loss of trained HCWs through emigration to other countries [10], movement to the private sector, urban settings or out of the health care system entirely, in combination with a limited capacity to train new providers to meet long-standing deficits. In countries with higher HIV prevalence rates, death has also been a major cause of HCW loss [9, 11-12]. These conditions have made retention of HCWs a core component of work to strengthen health systems [13]. Lack of HCW retention represents a loss of investment in training, expertise and disrupts the continuity of care available at a care and treatment sites [14]. This is particularly important in the context of HIV care and treatment where outcomes have been linked to provider expertise and considerable resources have been committed to ensuring the necessary knowledge and skills [15].

There is evidence that improving HCW motivation and job satisfaction has a positive effect on health workforce retention [15-17]. Studies in low and middle-income countries in Africa have identified a number of financial and non-financial system factors contributing to low motivation, dissatisfaction and non-retention of HCWs. These include: inadequate financial rewards, scarce opportunities for career development and continuing education, lack of job

security, poor working conditions and heavy workloads, shortages of necessary supplies, and inadequate supervision and support from management [19-22]. Low motivation and dissatisfaction have been linked to HCW absenteeism, high turnover, stress and decreased productivity [23]. Other studies in RLS suggest that HCW job satisfaction, which has been associated with staff retention, is also linked to the perception of ability to meet patient needs [21, 24-25]. While low motivation or high stress among HCWs has been reported in a number of RLS [15, 19, 20, 21, 26], little is known about motivation, stress and job satisfaction among the front-line HCW cadres in the context of recent worldwide efforts of rapid HIV care and treatment scale-up. These are clinical settings with significant demand and patient loads, but also have greater potential for receiving significant support through major initiatives such as the United States President's Emergency Program for AIDS Relief (PEPFAR)<sup>1</sup>. In this study, we assessed individual and site-related factors associated with HCW-reported stress, motivation and perceived ability to meet the needs of patients enrolled in PEPFAR-supported public sector HIV clinics in Dar es Salaam, Tanzania, in an attempt to identify areas that could be improved upon to promote staff retention of HCWs in this and other RLS.

## Methods

### Overview of the study design, setting and population

The study was part of a larger project looking at patient, provider, and systems factors associated with quality of health care and health system responsiveness in 16 public HIV and AIDS Care and Treatment Clinics (CTCs) in Dar es Salaam, Tanzania. The specific aims of this sub-study were to assess stress, motivation, satisfaction and the perceived ability to help patients and to meet patient needs among direct clinical care providers, clinical support staff and those in management at the sites.

The HIV CTCs include district hospitals, health centers and dispensaries and are part of a network of health facilities receiving technical, financial, and logistical support from the Muhimbili University of Health and Allied Sciences, Dar es Salaam City Council and the Harvard School of Public Health (MDH)-PEPFAR program in Dar es Salaam since 2004. The support provided by the MDH-PEPFAR program includes staff training and salary support, system strengthening and logistical support, laboratory facilities and physical infrastructure improvement, and the development of a quality management program. In this study, all HCWs aged 18 years or older working at the 16 CTCs were eligible to participate if they were among one of three groups: direct clinical care providers (physicians, clinical officers, nurses, pharmacists, and pharmacy technicians), clinical support staff (clinic attendants, medical records clerks, phlebotomists, and laboratory technicians), or management (site supervisors, site managers, coordinators, and data supervisors). Distribution of the questionnaires to all eligible HCWs was done in May 2009. Questionnaires were self-administered, anonymous and participation was voluntary.

### Tool development

The questionnaire was developed based on investigators' experience, a survey tool previously used by one of the investigators and a review of the literature on factors associated with motivation, stress, job satisfaction, and barriers and facilitators to delivery of quality of care among HCWs [27]. The final tool included questions on demographic characteristics (age, gender, cadre, current duties, duration of employment at the site), stress, motivation, perceived ability to meet patient needs, perceived quality of care, work

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<sup>1</sup>Currently known as the Tom Lantos and Henry J. Hyde United States Global Leadership against HIV/AIDS, Tuberculosis and Malaria, Reauthorization Act of 2008

environments (physical, teamwork, isolation, availability of needed resources), supervision, training, financial and non-financial incentives. Four- and five-item Likert scales were used for most questions. The questionnaire was translated into the local language in Tanzania (Kiswahili) and pre-tested in two HCW focus group discussions. Results from the focus groups were used to refine the questions, and add additional factors reported to affect the ability of HCWs to deliver quality care to patients.

**Site characteristics**—Characteristics of each CTC including site type (district hospital, health center or dispensary), number of patients seen per quarter, total number of HIV patients actively in care at the time of the study, and full time equivalents (FTEs) of different cadres of HCWs were extracted from site quarterly reports and existing records.

### Data analysis

Descriptive statistics were calculated for socio-demographic characteristics and HCW responses. Due to similarities in staffing composition and patient load, we analyzed health centers and dispensaries together. In all the analyses, missing responses were excluded.

**Factor analysis**—Responses to Likert-scale questionnaire items assessing motivation, stress, supervision, financial and non-financial incentives, training, teamwork, and working environment were standardized to range from 0 to 1, and entered into a principle components analysis to identify latent factors for the construction of several scales. Given the large number of questionnaire variables, we conducted two separate factor analyses using distinct sets of questionnaire variables. In total, eight factors were retained using Kaiser's eigenvalue rule and, after rotation, items with loadings less than 0.4 on these factors were dropped. Two of these factors were utilized for these analyses (Table 2). One factor, labeled motivation, included five items: rewarding nature of work (factor loading fl 0.63), salary (FL 0.68), motivation to perform well (FL 0.66), patient satisfaction with care (FL 0.54) and rating of overall clinical services (FL 0.56). The second factor, labeled stress, contained two items: work-related stress (FL 0.84) and emotional well being (FL 0.77). Cronbach's alpha for the scales were moderately high with an alpha coefficient of 0.69 for the motivation scale and 0.58 for the stress scale. Calculated scores for each scale were based on the simple summation of item scores which comprised the factor, with higher scores corresponding to greater motivation in the motivation scale and lower stress levels in the stress scale. For the purposes of these analyses, HCWs that scored in the highest tertile for the motivation scale and lowest tertile in the stress scale were compared to those scoring in the remaining tertiles.

**Multivariate analyses**—Multivariate analyses were conducted in order to identify site and individual characteristics independently associated with stress and motivation outcomes. Other outcomes of interest included the reported ability to help patients (assessed using a multinomial four-item Likert scale) and the ability to meet patient needs (assessed with a dichotomous yes/no question). Generalized linear models using the PROC GENMOD procedure were performed, using an exchangeable correlation structure for dichotomous outcomes to account for the nested nature of the data. For multinomial outcomes (i.e. ability to help patients), an independent working correlation structure was used. We double entered all the questionnaires into a customized Access database. Statistical analyses were done in SAS® 9.1 (Cary, N. C).

### Ethical issues

The Institutional Review Boards at Harvard School of Public Health, Harvard Medical School, Muhimbili University of Health and Allied Sciences and the National Institute of

Medical Research in Tanzania reviewed and approved the study protocol before the study began.

## Results

### Respondent and site characteristics

Response rate was high with 279 out of 382 HCWs (73%) completing and returning the questionnaires. Seventy seven percent of the respondents were direct clinical providers, 11% clinical support staff, 8% management staff and 77% of the HCWs were women (Table 1). The mean age of the respondents was 38 years, and the mean duration of working at an MDH supported site was 2 years. Of the 16 sites involved, three (19 %) were district hospitals and 13 (81%) were health centers or dispensaries. Five sites (31 %) were categorized as large (>1,000 patients seen per month), three sites (19 %) as medium (300-1000 patients seen per month) and eight sites (50%) as small sites (<300 patients seen per month). There were no significant differences noted in response rates based on site sizes.

The mean number of patients seen per day varied across cadres of HCWs: pharmacists saw the highest number of patients (119 patients), followed by doctors seeing 44 patients and nurses seeing 36 patients per day. Overall, across the 16 CTCs, the monthly active patient load from April to June 2009 per full-time equivalent (FTE) of direct care provider cadres were 547, 269 and 1042 patients per doctor, nurse and pharmacist respectively (Table 1).

### HCW motivation and stress

As shown in Table 2, nearly half (49%) of the HCW strongly agreed (33%) or agreed (16%) that they felt motivated to perform well in their jobs while 30% disagreed or strongly disagreed.

Stress was relatively low, with (72%) reporting stress at work less frequently: (sometimes 31%, or never 42%) and 41% of the HCWs reporting feeling emotionally drained by work only sometimes while 48% said they had never felt emotionally drained by work.

Overall the median score of the motivation scale for all participants was 3.2 (IQR 2.4-4.0) out of a maximum score of 4 (Table 3). There was variability of the motivation scores across cadre, with management cadre rating highest motivation (3.9) compared to the direct care and support cadres (3.2 and 3.3 respectively) (Table 3) and less variation was seen across site based on size or type. On the other hand the median score on the stress scale was 0.5 (IQR 0-1) out of a maximum score of 2 and there was little variability in the stress score based on HCW cadre or site factors.

### Training, skills and supervision

As seen in Table 2, 93% of the HCWs had received specialized training after joining the CTCs, with the majority of HCWs also reporting that they always felt confident in their skills (93%). When asked about the level of supervision at their sites, most of the respondents, 89% (strongly agree 50% or agree 39%), felt that their immediate supervisors provided adequate supervision. Furthermore, 59% (strongly agree 28% or agree 31%) that their supervisors clearly explained their expectations on performance to the HCW. Sixty-nine percent of HCWs strongly agreed (38%) or agreed (31%) that they understood their most recent performance rating although a third of the HCW reported that their supervisors provided no feedback on performance (strongly agree 10% or agree 22%). Among the direct care providers, 38% of doctors, 33% of nurses, 30% of phlebotomists and 26% of pharmacists strongly agreed or agreed that their supervisors did not provide adequate feedback.

### **Satisfaction and ability to meet patient needs**

Table 2 shows that 98% of HCWs felt able to help their patients (always 76%, often 22%). More than two thirds (68%) of HCWs reported that their work was rewarding (strongly agreed 42% and agreed 26%). Most HCWs (78%) felt patients were satisfied with the quality of care provided (strongly agreed 19% or agreed 59%) and over two-thirds (68%) rated the care they were providing as excellent (25%) or very good (43%). Only (3%) of HCWs rated services as fair or poor. Among HCWs with direct patient contact (direct clinical providers), 86% reported that they felt able to meet patient needs. Also summarized in Table 2 are health care workers responses to items assessing isolation, teamwork and their general working environments.

### **Isolation and teamwork**

Most HCWs (84%) reported that they never felt isolated in their work with only 15% reporting that they did not feel like they were a significant part of the team (always 5% or often 4% or sometimes 6%). Most (84%) strongly disagreed or disagreed that there were conflicts among team members in their clinics while 94% of the HCWs (strongly agree 49% or agree 45%) that other staff members respected them. More than three-quarters, 81% (strongly agree 36% or agree 45%), that staff members understood each other's roles.

### **General work environment; space, resources, compensation and communication**

Overall 82% of the HCWs rated the clinic environment as excellent (41 %) or very good (41%) while 72% of HCWs rated availability of clinical equipment and supplies needed for provision of care highly (excellent 30% or very good 42%). Adequate support and availability of necessary information to help decision making at the CTCs was rated as excellent or very good by 88% of the HCWs. However, lower ratings for physical space needed for privacy and patient care at the clinics was reported with only 59% of HCW rating physical space at the CTCs as excellent or very good.

### **Multivariate analysis of motivation, stress and ability to meet patient needs**

In the multivariate model examining HCW and site factors associated with motivation, direct clinical care providers rated motivation significantly lower than those in management (OR 0.26; 95% CI 0.10-0.73,  $p < 0.05$ ), while staff at medium-sized sites reported significantly higher motivation than colleagues based at larger sites (OR 2.00; 95% CI 1.05-3.82,  $p < 0.05$ ) (Table 4). None of the variables included in our model significantly predicted stress outcomes.

In a similar model, HCWs in both small and medium-sized sites were significantly more likely to feel able to help patients than HCWs at the largest sites (OR 2.55; 95% CI 1.11-5.81,  $p < 0.05$  and OR 1.84; 95% CI 1.27-2.65,  $p < 0.001$  respectively). There were no significant predictors of HCW-reported ability to meet patient needs. In all the multivariate models, respondent age, gender and patient load were not significantly associated with HCW motivation, stress, or reported ability to help and meet patient needs.

## **Discussion**

An understanding of how programs can increase motivation and decrease stress is a critical component of improving both HCW retention and performance. Despite significant patient loads and ongoing expansion of care, we found that the HCWs in a group of PEPFAR-supported HIV care and treatment clinics (CTCs) in Tanzania reported high levels of motivation, job satisfaction and relatively low levels of stress. HCWs also felt confident in their skills, abilities to provide quality services, meet patient needs, and felt part of a team



with respect and good communication. Working environments and availability of clinical equipment and supplies was also reported to be good.

Overall, the findings in this study on stress, motivation and job satisfaction among HCWs in resource-limited settings were strikingly better than previously reported studies [8, 21, 29]. The efforts of the MDH program to support HCWs through training and to improve systems and quality of care through health system strengthening may explain the observed differences between our findings and those of earlier studies, and may have addressed factors found to be associated with higher HCW stress and lower motivation.

In a main, urban-based, referral hospital in Tanzania, low motivation and high rates of dissatisfaction among HCWs were associated with poor working environments, inadequate facilities for performing expected tasks, low salaries and poor communication[21]. The MDH program has focused on ensuring strong infrastructure and most HCWs reported adequate equipment and facilities, as well as competitive salaries and clear expectations of their performance (Table 2).

Respondents in our study also reported a high perceived ability to meet patient needs, help patients and deliver quality care. Mathauer and Imhoff have previously described the concept of “professional conscience” and demonstrated how perceptions of being able to follow personal professional values contributed to higher motivation amongst HCWs in Benin 2006 [22]. The authors described this in relation to the utility of both non-financial incentives and human resource management tools for improving the motivation of HCWs in Africa.

The availability of training opportunities after joining the sites which was reported by almost all HCWs in the study supports previous work which explored the association between motivation and performance management and found that training was a motivator of HCW performance [28]. Other factors such as recognition, appreciation, and higher responsibility were also found to contribute to higher HCW motivation [28]. Wills-Shattuck and his colleagues performed a systematic review of studies exploring motivation and retention of HCWs in developing countries and found that while financial incentives were important, opportunities for continuing education, hospital infrastructure, and availability of resources were also strong contributing factors to motivation and retention of HCWs in RLS [15]. This is an important aspect of strengthening human resource management in health sectors also noted in our study.

Leshabari et al. reported low motivation among front-line health cadres in Tanzania [21]. In our study direct clinical care providers reported lower motivation than management staff, a tendency towards higher stress and a decreased perceived ability to meet patient needs. These findings have important implications if they result in decreased retention as this group represents the front line providers delivering care in the clinics.

Good supervision at the sites has been identified as an important component for human resource development, staff retention and motivation, with poor supervision for HCW-associated with poor performance, and low motivation and retention [10]. At MDH-supported sites the majority of the HCWs rated levels of supervision as good, although the proportion of HCWs receiving feedback on performance from supervisors was low, identifying an area for improvement. This rating of good supervision contrasts with a previous study in Tanzania exploring motivation in primary health care workers where HCWs reported having little or no on-site supervision from their immediate supervisors [29]. Supervision was identified as a factor that improved HCW motivation in Tanzania in the same study. In addition, in contrast to previous studies which showed HCWs had a

negative perception of supervision as a means to control their work [20]. HCWs in our study rated their relationship with and the overall support from their immediate supervisor highly.

A number of HCW factors, including gender, age and duration of work at the health care facilities, were not significantly associated with reported stress or motivation. This is similar to findings from a study exploring job satisfaction among Serbian workers [27], although, Kontodimopoulos et al. did find that more years spent working in the same hospital was associated with higher motivation among doctors in a study of motivational factors in Greek hospitals [31].

The finding that HCWs based in small- and medium-sized sites reported lower stress levels and higher motivation compared to HCWs working at larger sites, independent of reported patient load, suggests that there may be other work environment factors not measured in our survey, which are also associated with higher motivation and lower stress. This finding requires further study to identify what lessons can be shared from these smaller sites with their larger counterparts.

### Study Limitations

There were a number of limitations to our findings. Because of the cross-sectional study design, we are unable to link self-reported stress and motivation with retention of HCWs or the specific contribution of the health system strengthening efforts on these outcomes. However, the literature suggests that the areas measured in this study of stress and motivation as well as the perceived ability to deliver quality care are important factors associated with retention [15-17, 31]. We also could not link levels of motivation and perceived performance with the actual quality of care being delivered, an important outcome of efforts to support HCWs. There are also some limitations to the generalizability of this study. As noted above, the study was conducted among PEPFAR-supported public HIV sites that are likely to have better human resources, material supplies and financial support than other HIV and non-HIV public sector healthcare settings. The study was also conducted in an urban locale and so some of the attitudes and challenges among providers in rural sites may differ. Finally, while the response rate was high, the total number of respondents in each cadre did not allow us to study cadre-specific differences.

### Conclusion

In conclusion, a crucial component for addressing the daunting gap in human resources for health is to understand how best to effectively support motivation, decrease stress and improve satisfaction among HCWs through non-financial as well as financial incentives. Despite the fact that HCWs in our study are delivering care in high patient volume sites, we found that there was a good level of motivation, relatively low stress, and high ratings of teamwork. Moreover, we found that effective supervision could exist in settings focused on supporting health systems and delivery of health care. While the study was not designed to measure the impact of specific MDH support interventions, the strategic focus on holistic health system strengthening including HCW support through training, supervision and ensuring adequate infrastructure to provide quality care is likely to have contributed to our findings.

While more work is needed to understand the relative contribution of different interventions and feasible approaches to replicate this model of support, this work can contribute to efforts to understand effective approaches to building HCW capacity while supporting their ability to provide quality care and meet patient needs. Program managers, policy makers and local governments can also use these findings to identify potential gaps and implement interventions to strengthen the retention of skilled healthcare providers for the delivery of



effective and high quality care. Success in this area is critical in achieving the goal of universal access to effective HIV care and treatment for all in need.

## Acknowledgments

The authors would like to thank the clinics staff, site managers and supervisors of all the sites that participated in this study, Harvard University Center for AIDS Research (CFAR) which supported and funded the study through National Institutes of Health (NIH) funded program (P30AI060354) which is supported by the following NIH Institutes and Centers: National Institute of Allergy and Infectious Diseases (NIAID), National Cancer Institute (NCI), National Institute of Mental Health (NIMH), National Institute on Drug Abuse (NIDA), National Institute of Child Health and Human Development (NICHD), National Heart Lung and Blood Institute (NHLBI), and National Center for Complementary and Alternative Medicine (NCCAM). MEG was supported by the National Institutes of Health Office of the Director, Fogarty International Center, Office of AIDS Research, National Cancer Center, National Eye Institute (NEI), NHLBI, NIDA, NIMH, NIAID, National Institute of Dental and Craniofacial Research (NIDCR), NIH, Office of Women's Health and Research through the International Clinical Research Fellows Program at Vanderbilt University (R24TW007988) and the American Relief and Recovery Act. We would also like to also thank Gabriela Poles, Justina Tito, Melanie Lo, and Emerensiana Nampanda for their contributions to the study.

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**Table 1**

## Participants and site characteristics

Characteristics	Mean(SD) <sup>a</sup>
Age(years)	38 (8)
Duration of working at MDH <sup>b</sup> supported sites (range 2-5+ years)	2 (2)
	<b>Number (%)</b>
Female	216 (77)
<b>Groups of Health care workers( HCW) (n=279)</b>	<b>Number (%)</b>
Direct clinical provider	215 (77)
Doctor	48 (17)
Nurse <sup>c</sup>	130 (47)
Pharmacists <sup>d</sup>	37 (13)
Clinical support staff	31 (11)
Phlebotomist	25 (9)
Lab technicians	3 (1)
Clinic attendants/ medical records clerks	3 (1)
Management staff <sup>e</sup>	22 (8)
<b>Number of patients seen per day, by cadre of HCW</b>	<b>Mean (SD)</b>
Doctor	44 (20)
Nurse	36 (31)
Pharmacist	119 (67)
Phlebotomist	84 (85)
<b>Type of site (N=16)</b>	<b>Number (%)</b>
District Hospital	3 (19)
Health Center/dispensary	13 (81)
<b>Site Size</b>	<b>Number (%)</b>
Small (< 300 patients seen per month)	8 (50)
Medium (300 - 1000 patients seen per month)	3 (19)
Large (1000+ patients seen per month)	5 (31)
<b>Staffing Ratios (number of patients per quarter / FTE <sup>f</sup>)</b>	<b>Mean (SD)</b>
Doctors	547(237)
Nurses	269 (130)
Pharmacists	1,042 (501)

<sup>a</sup>Where applicable, percents may not add up to 100% due to rounding

<sup>b</sup>MDH= Muhimbili University of Health and Allied Sciences- Dar es Salaam City Council- Harvard School of Public Health

<sup>c</sup>Includes nurses and nurse counselors

<sup>d</sup>Includes pharmacy technicians

<sup>e</sup>Includes site supervisors, site managers, coordinators, and data supervisors

<sup>f</sup>FTE = full-time equivalent

<sup>g</sup>Includes only 12 sites which had pharmacists.

**Table 2**

HCW responses regarding motivation, stress, supervision team work and work environment.

Scale	Responses			
	Strongly Agree % (N)	Agree % (N)	Neither Agree nor Disagree % (N)	Disagree/ Strongly disagree % (N)
<b>Motivation</b>				
Motivated to perform well	16 (44)	33 (92)	21 (59)	30 (84)
Work is rewarding	42 (117)	26 (73)	24 (67)	8 (22)
Salary is competitive	19 (53)	24 (67)	36 (100)	21 (59)
Patients are satisfied with care	19 (53)	59 (165)	19 (53)	3 (8)
<b>Stress</b>	<b>Always</b>	<b>Often</b>	<b>Sometimes</b>	<b>Never</b>
Work is stressful	10 (27)	18 (50)	31 (86)	42 (116)
I feel emotionally drained by work	4 (11)	7 (20)	41 (114)	48 (134)
<b>Training</b>	<b>Yes</b>	<b>No</b>		
Received any specialized training since joined MDH	93 (260)	7 (19)		
<b>Skill and ability</b>	Always	Often	Sometimes	Never
I have confidence in skills	93 (260)	7 (19)	0	0
<b>Support and Systems</b>				
<b>Relationship with Supervisor</b>	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree/ Strongly disagree
Supervisor provides adequate supervision	50 (140)	39 (109)	10 (28)	1 (2)
I appreciate and respect my immediate supervisor	70 (195)	25 (70)	4 (11)	1 (3)
<b>Supervision</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Neither Agree nor Disagree</b>	<b>Disagree/ Strongly disagree</b>
Supervisor explains expectations on my performance	28 (79)	31 (87)	21 (59)	19 (54)
I understands results of my recent performance review	38 (106)	31 (86)	12 (34)	19 (53)
Supervisor does not provide feedback on my performance	10 (28)	22 (61)	19 (53)	49 (137)
I am given feedback on how to improve performance	22 (61)	30 (84)	17 (47)	31 (87)
<b>Ability to meet patient needs</b>	<b>Yes</b>	<b>No</b>		
I can help my patients	76 (213)	22 (63)	1 (3)	0
I am able to meet patient needs	86 (240)	14 (39)	0	0
	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair/Poor</b>
HCW Rating of clinical services provided	25 (69)	43 (119)	30 (83)	3 (8)
<b>Isolation</b>	<b>Always</b>	<b>Often</b>	<b>Sometimes</b>	<b>Never</b>
Feel isolated in my work	1 (3)	4 (11)	11 (31)	84 (234)
Other staff do not listen to/understand me	7 (21)	9 (26)	28 (79)	55 (153)
I do not feel like I am a significant part of the team	4 (11)	5 (14)	6 (17)	85 (237)
<b>Team</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Neither agree/disagree</b>	<b>Strongly disagree /disagree</b>
There is conflict among members of my team	2 (6)	3 (8)	11 (31)	84 (234)

Scale	Responses			
	Strongly Agree % (N)	Agree % (N)	Neither Agree nor Disagree % (N)	Disagree/ Strongly disagree % (N)
Staff members understand each other's roles	36 (98)	45 (121)	14 (53)	5 (13)
I do not feel like I am a significant part of the team	4 (11)	5 (14)	6 (17)	85 (237)
Other staff members respect me	49 (138)	45 (126)	4 (12)	1 (3)
<b>Space, equipment, clinic environment and information</b>	<b>Excellent</b>	<b>Very good</b>	<b>Fair</b>	<b>Poor</b>
Clinic environment	41 (114)	41 (114)	11 (31)	7 (20)
Adequate clinical equipment, supplies for good care	30 (84)	42 (117)	17 (47)	1 (31)
Adequate support, information to help in decisions	41 (114)	47 (131)	7 (20)	5 (14)
Adequate space for care and ensure privacy at CTC	30 (84)	29 (81)	12 (33)	29 (81)

<sup>a</sup>Percents may not add up to 100% due to rounding



**Table 3**

Motivation and Stress scales scores for different HCW cadres and sites

Characteristics	<sup>a</sup> Motivation (0-5) Median(25 <sup>th</sup> -75 <sup>th</sup> percentile )	<sup>b</sup> Stress (0-2) Median (25 <sup>th</sup> -75 <sup>th</sup> percentile)
All(overall)	3.4 (2.4-4.0)	0.3 (0-1)
<b>Cadre</b>		
-Direct	3.3 (2.6-3.6)	0.3 (0-1)
-Management	4.0 (3.3-4.3)	0.3 (0-1)
-Support	3.5 (2.4-3.5)	0.3 (0-2)
<b>Site size</b>		
Small	3.5(2.7-3.5)	0.3(0-1)
Medium	2.9(2.9-4.0)	0.3(0-0.7)
Large	3.3(2.6-3.7)	0.7(0-1)
<b>Site type</b>		
Health center	3.4(2.7-4.0)	0.3(0-1)
Hospital	2.8(2.6-3.7)	0.7(0-1)

<sup>a</sup>Higher scores mean more motivation,

<sup>b</sup>Higher scores mean more stress

**Table 4**

Multivariate models of HCW, site characteristics, ability to help patients, ability to meet patient needs, stress, and motivation scales

	Ability to Help Patients		Ability to Meet Patient needs		Stress		Motivation	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age	0.99	0.96, 1.02	0.98	0.96, 1.01	1.01	0.98, 1.04	0.98	0.95, 1.02
Sex								
Male	0.88	0.47, 1.65	1.32	0.40, 4.39	1.64	0.72, 3.70	0.60	0.28, 1.28
Female	--	--	--	--	--	--	--	--
Cadre								
Direct Care	1.09	0.37, 3.20	0.71	0.09, 5.38	1.10	0.36, 3.37	0.26 <sup>a</sup>	0.1, 0.73
Support	2.89	0.67, 12.73	1.3	0.07, 23.35	1.00	0.27, 3.74	0.29	0.07, 1.24
Management	--	--	--	--	--	--	--	--
Site Size								
Small	2.55 <sup>a</sup>	1.11, 5.81	1.88	0.36, 9.94	1.09	0.46, 2.60	2.01	0.63, 6.47
Medium	1.84 <sup>b</sup>	1.27, 2.65	1.39	0.40, 4.75	0.74	0.35, 1.57	2.00 <sup>a</sup>	1.05, 3.82
Large	--	--	--	--	--	--	--	--
Patient Load	1.00	1.00, 1.01	1.00	0.99, 1.01	1.00	0.99, 1.09	1.00	0.99, 1.01

<sup>a</sup> p<0.05

<sup>b</sup> p<0.001