

Assessment of Pharmacists Workforce in Ethiopia

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Abstract

Background: Health workers are recognized as the cornerstone for the success of the health sector programs. In this regard, proper planning of the development of health workers including pharmacists based on evidence is critical.

Aim: To assess pharmacists work force in Ethiopia.

Method: A national facility based census of the pharmacist workforce was conducted in Ethiopia. Pharmacists' job satisfaction was also assessed taking cross-section of pharmacists from six regions by applying stratified random sampling method. Self-administered questionnaire was employed for the quantitative data collection.

Results: The study revealed a pharmacist density of 2.38 per 100,000 population. Across different regions of the country, the density ranges from 0.66 to 29.88. Pharmacists' satisfaction with their job appeared to be slightly above the average mean score, with overall mean job satisfaction score of 3.0(SD=1.11) in a scale of 1-5. Relation with fellow professionals was an item with the highest mean job satisfaction, while remuneration, ranked least by pharmacists. Hospital pharmacists and younger pharmacists were significantly less satisfied than pharmacists in the other categories.

Conclusion: This study has shown that Ethiopia suffers from shortage of pharmacists and maldistribution across regions was also evident. Moreover, job satisfaction of the pharmacists in the country was slightly higher than the average mean satisfaction score. Thus, government and other stakeholders should work together to devise mechanisms that could improve pharmacists' job satisfaction, ease uneven distribution among regions and increase the future workforce.

Introduction

Health workers have been defined by World Health Organization (WHO) as people whose job is to protect and improve the health of their communities (1). They are an essential input into the delivery of health services and a critical component in health policies (2,3). There is a consensus that despite their importance human resources have been a neglected component of health system development in low income countries (4).

Currently human resources are in very short supply in the health systems of low and middle income countries compared to high income countries or with the skill requirements of a minimum package of health interventions (5). The double burden of infectious and non-communicable diseases in developing countries is placing increasing demands on health systems (6). Hence, in the present decade the health sectors of low income countries needs much more health workers to deliver the basic health services and possibly achieve the health sector related Millennium development goals (MDGs). At least three and arguably all of the MDGs will not be achieved without improvement in the functioning of health systems (5). Although substantial new resources are promised to health systems, many of the constraints cannot easily be resolved by money alone (4,7).

Higher worker density is an important determinant of improving population health and human survival. The density of workers can make an enormous difference in

the effectiveness of MDG interventions to reach the targets (8). However, the low income countries are severely suffering from shortage of health workers. Analysis of global health workers done by Adams *et al.* showed that, Sub-Saharan Africa has a tenth of the nurses and doctors for its population that Europe has (9). In addition, nearly all countries have maldistribution of health workers, which is worsened by migration of highly skilled workers from poorer to richer regions (7,9). One of the main reasons for the mobility of health professional is the availability of high global market for health workers at many levels that they can get more payments (7). Other reasons for migration include poor working conditions, lack of career opportunities and dissatisfaction with the management (10).

Pharmacists represent the third largest healthcare professional group in the world. The majority of pharmacists practice in community, hospitals and other medical facilities. Smaller numbers of pharmacists are employed in the pharmaceutical industry, regulatory, academic and research institutions. Though shortage of pharmacists is an issue in both developing and developed countries, it is very serious in developing countries. The data collected by International Pharmaceutical Federation (FIP) revealed that pharmacist density varies widely from less than 5 pharmacists per 100,000 populations to as high as over 200 pharmacists per 100,000 populations. The low availability of pharmacists in many developing countries is exacerbated by geographical distribution disparity between rural and urban areas (8).

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In Ethiopia the pharmaceutical sector is guided by a National Drug Policy which was developed in line with the National Health Policy and the sector is regulated by the "Food, Medicine and Health Care Administration and Control Proclamation No. 661/2009" (11,12). The country experiences a heavy burden of disease with a growing prevalence of communicable and chronic diseases (13). These problems are exacerbated by the shortage of trained manpower and health facilities. According to recent report by the Ministry of Health, the country has a total of 194 hospitals, 2660 health centers, 377 community pharmacies, 1669 drug stores and 1392 rural drug vendors (14). Despite considerable growth in the number of pharmaceutical industries and pharmacy schools in the country, the number is only limited to nine pharmaceutical industries and nine public universities offering pharmacy degree (15, 16).

In many countries, pharmacists are the most accessible of all health workers and as such play a key role in the delivery of healthcare services at all levels. Pharmacist responsibility has evolved from that of a compounder and supplier of pharmaceutical products towards that of a provider of patient care. The changes in the practice of pharmacy, combined with an aging society with chronic diseases and newly approved medications, result in the need for a significantly expanded pharmacist work force with appropriate education and training. However, the role of pharmacist in Ethiopia is still lagging behind. Pharmacists are working as compounder and supplier of pharmaceuticals which is considered as the traditional role of pharmacists. The country also lacks a comprehensive document of pharmacy workforce. As a result, fundamental questions regarding the status of the pharmacy workforce, its level of performance and the problems they face remain largely unanswered. Therefore, the aim of this study was to determine pharmacists' density, compare level of distribution among regions and assess level of job satisfaction of pharmacists so that it would help in critical evaluation of the national pharmacy workforce.

Methods

The study was based on facility based census and cross-sectional survey that employed a quantitative method of data collection. It was conducted between May and September, 2010. All pharmacists in Ethiopia who were actively practicing within the pharmacy profession in all public, non-governmental organization and private sectors were the source and study population for this study. However, variables related to pharmacists' job satisfaction were assessed taking cross-section of the pharmacists by applying stratified random sampling method. The regions/city administrations were stratified based on their level of development into emerging (historically disadvantaged) regions and historically advantaged regions. Of the nine regions and two city administrations, the study was conducted in Addis Ababa, two emerging regions (Afar and Benshangul Gumuz), and three historically advantaged regions

(Amhara, Oromia and Tigray). Addis Ababa was selected purposively due to the fact that almost half of the pharmacists in the country were working in the capital city. The two emerging regions and three historically advantaged regions were selected using stratified simple random sampling.

The sample size for the cross-sectional survey was calculated using a single proportion formula (17). Accordingly 422 participants were selected for the study and the number of pharmacists to participate in the study from each region was decided based on proportionate to size. Two hundred twenty four (53.2%) of the questionnaire were distributed in Addis Ababa and the rest were distributed in Oromia 91 (21.6%), Amhara 75 (17.7%), Tigray 28 (6.8%), Afar 3 (0.7%), and Benshangul gumuz 1 (0.2%). The participants were selected using quota sampling method.

In the census survey, information about the pharmacists' sex, current practice area categories and region of practice were gathered from the facilities' human resource document using a data abstraction form. For the cross-sectional survey, a slightly modified version of the Royal Pharmaceutical Society of Great Britain used with pharmacists and Minnesota studies in vocational rehabilitation job satisfaction scale were used to measure job satisfaction of pharmacists (18, 19). Pre-testing of the tools was done in all areas of pharmacy practice and modification was done accordingly. In the self administered questionnaire used to assess pharmacists' job satisfaction, while one item measures overall job satisfaction, other items measure satisfaction with particular aspects of work and each item was rated on a five-point scale from 1 (very dissatisfied) to 5 (very satisfied). Since all of the statement were positively worded, smaller mean values showed lesser satisfaction and a high score indicated higher satisfaction.

Data Analysis: The participants' responses were encoded and data were analyzed using SPSS version 15. Descriptive analysis was used to calculate the proportion and mean score of respondents. Association between pharmacists' job satisfaction and demographic variables were explored using student's t-test and one-way ANOVA with a significance level of p value of < 0.05.

Ethical Considerations: Approval was obtained from the School of Pharmacy, Addis Ababa University Ethics Review Committee and Regional Health Bureaus. Written informed consent was obtained from participants after they were introduced about the purpose of the study.

Results

Findings from Census

Socio-demographic Characteristics and Pattern of Practice:

The census revealed that the total number of pharmacists practicing in Ethiopia was 1898. As shown in Table 1, at the country level the proportion of male pharmacists 1474(77.6%) was much higher than female

pharmacists 424(22.4%). The variation in gender composition was also evident within the regions/city administration where in all regions/city administrations the proportion of male pharmacists exceeds that of females. It also showed that there were significant variations in the distribution of pharmacists by regions. Accordingly, the largest proportion 871(45.9%) of the country's pharmacy workforce was found in Addis Ababa and the lowest proportion 5(0.3%) was in Benishangul Gumuz Regional State.

Regarding the pattern of practice, hospital pharmacy accounted the largest proportion of pharmacists 638(33.6%) followed by sales and marketing 356(18.8%) and community pharmacy 351(18.5%) (Table 2). Slightly more than half (52.1%) of the pharmacists were working in two areas of practice, namely hospital and community pharmacies. In the capital city, however, the proportion of pharmacists working in sales and marketing constituted the largest share, 265(30.4%). The proportion of pharmacists working in industry, academic and research, regulatory and government offices were 64(3.4%), 175(9.1%) and 214(11.5%) respectively.

Higher proportion of female pharmacists than males were working in hospital (37.3% Vs 32.6%) and community pharmacy (26.4% Vs 16.2%). However, proportion of male pharmacists was higher in the remaining area of practice, the highest being in sales and marketing 285 (19.3%).

Slightly more than half (53.7%) of the pharmacists in Ethiopia were working in public/government organizations and 745(39.3%) of the pharmacist were either working in private sectors or self employed. The rest 134(7.1%) of the pharmacists were working in NGOs including civic organizations, red cross, extraterritorial agencies which include UN agencies, AU, EU, bilateral donors and diplomatic missions.

Density of Pharmacists per 100,000 Population: The highest density of pharmacist was recorded in Addis Ababa (29.88 pharmacists per 100,000 population) and the lowest was in Afar which was 0.66 pharmacists per 100,000 population. The national density of pharmacists was calculated to be 2.38 (Table 1).

Table 1: **Density and Distribution of Actively Practicing Pharmacists by Region/City Administration and Gender, Ethiopia, 2010**

| Region/City Administration | Male N (%) | Female N (%) | Total No. of Pharmacists, N(%) | Population Size | Density of Pharmacists per 100,000 Population |
|----------------------------|--------------|--------------|--------------------------------|-----------------|---|
| Addis Ababa | 595 (31.4) | 276 (14.5) | 871 (45.9) | 2,914,406 | 29.88 |
| Oromia | 306 (16.1) | 49 (2.6) | 355 (18.7) | 29,590,044 | 1.20 |
| Amhara | 241 (12.7) | 52 (2.7) | 293 (15.4) | 18,106,982 | 1.62 |
| SNNPR | 123 (6.5) | 13 (0.7) | 136 (7.2) | 16,389,550 | 0.83 |
| Tigray | 95 (5.0) | 15 (0.8) | 110 (5.8) | 4,647,222 | 2.36 |
| Dire Dawa | 37(1.9) | 4 (0.2) | 41 (2.1) | 369,187 | 11.11 |
| Harar | 15 (0.8) | 9 (0.5) | 24 (1.3) | 198,020 | 12.12 |
| Afar | 9 (0.5) | 1 (0.05) | 10 (0.5) | 1,506,288 | 0.66 |
| Gambella | 9 (0.5) | 1 (0.05) | 10 (0.5) | 346,236 | 2.89 |
| Benishangul Gumuz | 5 (0.3) | 0 (0) | 5 (0.3) | 733,053 | 0.68 |
| Somali | 39 (2.1) | 4 (0.2) | 43 (2.3) | 4,794,481 | 0.90 |
| Country Total | 1,472 (77.6) | 424 (22.4) | 1898 (100) | 79,835,354 | 2.38 |

Table 2: **Proportion of Actively Working Pharmacists by Region/City Administration and Area of Practice, Ethiopia, 2010.**

| Area of practice | Community, N (%) | Hospital, N (%) | Regulatory and Government Office, N (%) | Industry, N (%) | Sales and Marketing, N (%) | Academic and Research, N (%) | Others*, N (%) | Total, N (%) |
|-------------------------|-------------------------|------------------------|--|------------------------|-----------------------------------|-------------------------------------|-----------------------|---------------------|
| Addis Ababa | 225 (11.9) | 153 (8.1) | 73 (3.8) | 29 (1.5) | 265 (14.0) | 58 (3.1) | 68(3.6) | 871 (45.9) |
| Oromia | 49 (2.6) | 174(9.2) | 58(3.1) | 19(1.0) | 32(1.7) | 9(0.5) | 14(0.7) | 355 (18.7) |
| Amhara | 38(2.0) | 143(7.5) | 43 (2.3) | 0(0.0) | 22(1.2) | 40(2.1) | 7(0.4) | 293 (15.3) |
| SNNPR | 18(0.9) | 54(2.8) | 19(1.0) | 0(0.0) | 12(0.6) | 26(1.4) | 7(0.4) | 136 (7.2) |
| Tigray | 6(0.3) | 39(2.1) | 7(0.4) | 16(0.8) | 14(0.7) | 26(1.4) | 2(0.1) | 110 (5.8) |
| Dire Dawa | 7(0.4) | 17(0.9) | 7(0.4) | 0(0.0) | 8(0.4) | 0(0.0) | 2(0.1) | 41 (2.2) |
| Harar | 6(0.3) | 9(0.5) | 1(0.1) | 0(0.0) | 3(0.2) | 5(0.3) | 0(0.0) | 24 (1.3) |
| Afar | 0(0.0) | 9(0.5) | 1(0.1) | 0(0.0) | 0(0.0) | 0(0.0) | 0(0.0) | 10 (0.5) |
| Gambella | 0(0.0) | 9(0.5) | 1(0.1) | 0(0.0) | 0(0.0) | 0(0.0) | 0(0.0) | 10 (0.5) |
| Benishangul Gumuz | 0(0.0) | 3(0.2) | 1(0.1) | 0(0.0) | 0(0.0) | 1(0.1) | 0(0.0) | 5 (0.3) |
| Somali | 1 (0.1) | 29(1.5) | 3(0.2) | 0(0.0) | 0(0.0) | 10(0.5) | 0(0.0) | 43 (2.3) |
| Total, N (%) | 351(18.5) | 638 (33.6) | 214 (11.3) | 64 (3.4) | 356 (18.8) | 175 (9.2) | 100 (5.3) | 1898 (100) |

* Consultancy, administrative office other than government

Findings from Cross-sectional Study: A total of 422 self administered questionnaires were distributed to pharmacists practicing in five regions and one city administration. Of the 422 study participants, 393 pharmacists returned the questionnaire making the response rate of the survey 93.2%. The mean age of the pharmacists was 30.2 years (SD = 8.3, range: 21 to 63 years). Two hundred forty eight (64.1%) of the respondents had age of 30 years and below and majority of the study participants were B. Pharm holders, 347(88.3%). About two-third (64.1%) of the pharmacists were single and 136 (34.6%) were married (Table 3).

The average number of years in professional job for the pharmacist was 5.8 years (SD = 7.3) and the average number of years at current job was 3.6(SD = 4.5). The average number of hours worked per week in his/her main job was 46.3(SD = 11.6).

Pharmacists' Job Satisfaction: Pharmacists in general derive slightly higher than the average level of job satisfaction, with a mean score of 3.0 ± 1.11 (mean \pm SD) on the overall job satisfaction item, in scale of 1-5. The item with the highest mean score (3.74 ± 1.06) was

satisfaction in relation with colleagues and fellow professionals while remuneration was an item with the lowest mean satisfaction score of 2.55 ± 1.22 (Table 4).

Table 3: **Socio-demographic Characteristics of Respondents (N= 393), Ethiopia, 2010.**

| Socio-demographic Profile | N (%) |
|-------------------------------------|------------|
| Age | |
| ≤ 30 years | 248 (64.1) |
| 31-40 years | 88(22.7) |
| > 40 years | 51(13.2) |
| Marital Status | |
| Single | 252(64.1) |
| Married | 136(34.6) |
| Divorced | 3(0.8) |
| Widowed | 2(0.5) |
| Education | |
| B.Pharm (BSc in Pharmacy) | 347(88.3) |
| MSc in Pharmacy | 45(11.5) |
| PhD in Pharmacy | 1(0.3) |
| Professional Work Experience | |
| < 5 years | 260(68.2) |
| 5-10 years | 58 (15.2) |
| >10 years | 63(16.5) |

Table 4: **Job Satisfaction Mean Values for All Pharmacists, Ethiopia, 2010.**

| Item | All Pharmacists (N = 393) | |
|--|---------------------------|------------|
| | Rank | Mean(SD) |
| Physical working conditions | 11 | 3.04(1.18) |
| Freedom to choose their own method of working | 5 | 3.29(1.22) |
| Relation with colleague and fellow professionals | 1 | 3.74(1.06) |
| Recognition they get for good work | 8 | 3.17(1.16) |
| Amount of responsibility they were given | 2 | 3.57(1.10) |
| Payment for their work (remuneration) | 17 | 2.55(1.22) |
| Opportunity to use their abilities | 13 | 2.96(1.22) |
| Work load and staffing adequacy | 10 | 3.05(1.11) |
| Amount of variety in their job (Scope of practice) | 14 | 2.84(1.09) |
| The way their boss handles his/her workers | 7 | 3.18(1.23) |
| Competence of their supervisors in making decisions | 9 | 3.13(1.17) |
| Chance to tell people what to do | 3 | 3.36(1.06) |
| Being able to do things that don't go against their conscience | 4 | 3.31(0.94) |
| Feeling of accomplishment they get from the job | 6 | 3.26(1.09) |
| The way institution policies were put into practice | 15 | 2.76(1.09) |
| Chances of advancement on this job | 16 | 2.67(1.15) |
| Overall satisfaction with their current main job | 12 | 3.00(1.11) |

A one-way group analysis of variance was conducted to explore the impact of age on levels of job satisfaction. For all items of job satisfaction, analysis showed that there was a statistically significant difference among the three age groups except for the relation with colleague and fellow professionals (Table 5). For all items, younger pharmacists (age of ≤ 30 years) reported lower satisfaction than the middle age group (31-40 years) pharmacists. On the other hand, older pharmacists (> 40 years) reported a higher satisfaction for all items than the other age groups. Amount of responsibility they were given ranked first by the older pharmacists with mean score of 3.94 ± 0.97 .

Analysis of job satisfaction by year of professional work experience revealed that more experienced pharmacists (> 10 years of professional work experience) scored a consistently higher mean on all work satisfaction items than with less experienced pharmacists (both < 5 years and 5-10 years of professional work experience). The differences between more and less experienced pharmacists were significant for all of the items, with the exception of relation with colleague and fellow professionals. Pharmacists with more than 10 years work experience rated freedom to choose their own method as first while less experienced pharmacists ranked first for relation with colleague and fellow professionals (Table 5).

Table 5: **Pharmacists' Job Satisfaction Mean Values by Age Group and Years of Professional Work Experience, Ethiopia, 2010.**

| Item | Pharmacists Age Group | | | Years of Professional Work Experience | | |
|--|-----------------------|------------------|----------------|---------------------------------------|--------------------|-------------------|
| | ≤30 yrs (N=248) | 31-40 yrs (N=88) | >40 yrs (N=51) | < 5 years (N=260) | 5-10 years (N= 58) | >10 years (N= 63) |
| | Mean(SD) | Mean(SD) | Mean(SD) | Mean(SD) | Mean(SD) | Mean(SD) |
| Physical working conditions * | 2.84 (1.19) | 3.32(1.08) | 3.61(1.06) | 2.86(1.16) | 3.09(1.31) | 3.68(.90) |
| Freedom to choose their own method of working * | 3.05(1.20) | 3.73(1.17) | 3.80(1.06) | 3.03(1.19) | 3.51(1.26) | 3.95(.98) |
| Relation with colleague and fellow professionals | 3.72(1.06) | 3.81(1.07) | 3.82(.95) | 3.69(1.08) | 3.86(1.10) | 3.84(.93) |
| Recognition they get for good work * | 3.03(1.15) | 3.29(1.10) | 3.71(1.12) | 3.03(1.14) | 3.20(1.24) | 3.75(.97) |
| Amount of responsibility given * | 3.45(1.13) | 3.76(.98) | 3.94(.97) | 3.48(1.11) | 3.50(1.13) | 3.92(.94) |
| Remuneration * | 2.20(1.05) | 2.98(1.29) | 3.57(1.06) | 2.24(1.07) | 2.74(1.34) | 3.47(1.02) |
| Opportunity to use their abilities * | 2.73(1.18) | 3.26(1.15) | 3.55(1.23) | 2.74(1.20) | 3.17(1.13) | 3.44(1.13) |
| Hours of work load and staffing adequacy * | 2.82(1.11) | 3.37(1.04) | 3.63(.86) | 2.83(1.11) | 3.26(1.09) | 3.61(.84) |
| Amount of variety in their job (Scope of practice) * | 2.72(1.11) | 3.00(1.04) | 3.17(1.02) | 2.69(1.10) | 3.04(1.08) | 3.24(.90) |
| The way your boss handles his/her workers * | 3.02(1.28) | 3.40(1.02) | 3.63(1.10) | 3.02(1.28) | 3.26(1.08) | 3.75(.99) |
| Competence of their supervisors in making decisions * | 3.02(1.19) | 3.27(1.07) | 3.49(1.16) | 2.99(1.17) | 3.28(1.19) | 3.53(1.09) |
| Chance to tell people what to do * | 3.22(1.08) | 3.51(.97) | 3.78(.96) | 3.22(1.09) | 3.23(1.06) | 3.92(.80) |
| Being able to do things that don't go against their conscience * | 3.17(.93) | 3.48(.82) | 3.77(.95) | 3.18(.92) | 3.35(.85) | 3.77(.96) |
| Feeling of accomplishment they get from the job * | 3.08(1.12) | 3.52(.96) | 3.71(.97) | 3.09(1.11) | 3.30(1.03) | 3.76(.82) |
| The way institutional policies were put in to practice * | 2.56(1.09) | 3.02(.95) | 3.27(1.07) | 2.57(1.07) | 2.93(1.01) | 3.34(.97) |
| Chances of advancement on this job * | 2.51(1.15) | 2.84(1.14) | 3.18(1.02) | 2.49(1.14) | 2.86(1.15) | 3.22(.98) |
| Satisfaction with their current main job * | 2.80(1.07) | 3.24(1.06) | 3.69(1.03) | 2.81(1.09) | 3.12(1.13) | 3.65(.95) |

* Differences between pharmacists in different age groups and in different years of professional work experience were significant at $P < 0.05$ (ANOVA).

Table 6: Work Satisfaction Item Means by Area of Practice (Std.Dev), Ethiopia, 2010.

| Item | Community Pharmacy (N=75) | Hospital Pharmacy (N=143) | Industry (N=20) | Academic and Research (N=34) | Sales and Marketing (N=64) | Regulatory and Office (N=39) | Others ** (N=18) |
|--|---------------------------|---------------------------|-----------------|------------------------------|----------------------------|------------------------------|------------------|
| Physical working conditions * | 3.48(1.01) | 2.57(1.16) | 2.45(1.00) | 3.30(1.21) | 3.66(1.02) | 2.86(1.10) | 3.47 (1.01) |
| Freedom to choose their own method of working * | 3.68(1.20) | 2.76(1.14) | 3.30(1.13) | 3.67(1.34) | 3.78(1.07) | 3.16 (1.17) | 3.59 (1.00) |
| Relation with colleague and fellow professionals * | 3.75 (1.02) | 3.48(1.13) | 4.10(0.72) | 3.76 (.99) | 3.98(1.03) | 3.97 (1.09) | 4.06 (.87) |
| Recognition they get for good work * | 3.57 (1.10) | 2.81(1.15) | 3.25(1.12) | 2.88(1.12) | 3.65 (.99) | 3.05 (1.15) | 3.56 (1.04) |
| Amount of responsibility they were given * | 3.91(.94) | 3.20 (1.15) | 3.80 (.95) | 3.71(1.06) | 3.82(1.09) | 3.66(.99) | 3.67 (.91) |
| Payment for their work (remuneration) * | 3.15 (1.13) | 2.10 (.99) | 2.35(1.14) | 1.97 (.98) | 3.36(1.23) | 1.90 (1.02) | 3.44 (.98) |
| Opportunity to use their abilities * | 3.21 (1.25) | 2.53(1.15) | 2.95(1.10) | 2.73(1.23) | 3.48(1.08) | 3.08 (1.24) | 3.67 (.77) |
| Work load and staffing adequacy * | 3.43 (1.01) | 2.68(1.11) | 2.50(1.00) | 3.09(1.11) | 3.52 (.95) | 3.05 (1.05) | 3.39 (1.15) |
| Amount of variety in their job(Scope of practice) * | 2.90 (1.05) | 2.50(1.10) | 2.80(1.01) | 2.91(1.16) | 3.22 (.89) | 3.16 (1.03) | 3.29 (1.21) |
| The way their boss handles his/her workers * | 3.66 (1.09) | 2.74(1.21) | 3.15(1.18) | 3.29(1.22) | 3.75 (.99) | 2.97 (1.37) | 3.39 (1.04) |
| Competence of their supervisors in making decisions* | 3.41 (1.26) | 2.74(1.11) | 3.15 (.99) | 3.24(1.25) | 3.71 (.90) | 3.00 (1.21) | 3.41 (1.01) |
| Chance to tell people what to do | 3.74 (.95) | 3.05(1.10) | 3.50 (.89) | 3.21 (.89) | 3.70 (.97) | 3.10 (1.17) | 3.61 (.98) |
| Being able to do things that don't go against their conscience * | 3.58(.91) | 3.00 (.98) | 3.50 (.76) | 3.28 (.89) | 3.55 (.81) | 3.32(.93) | 3.56 (.71) |
| Feeling of accomplishment they get from the job * | 3.48(.97) | 2.90(1.13) | 3.50(1.15) | 3.35 (.95) | 3.78 (.85) | 3.05 (1.11) | 3.41 (1.12) |
| The way institution policies were put in to practice * | 3.06 (1.03) | 2.26 (.90) | 3.05(1.13) | 2.48 (.98) | 3.43(1.01) | 2.74 (1.16) | 3.56 (.81) |
| Chances of advancement on this job * | 2.65 (1.17) | 2.16(1.01) | 2.63(1.07) | 2.94(1.09) | 3.41(1.03) | 2.92 (1.09) | 3.17 (1.15) |
| Overall satisfaction with their current main job * | 3.25 (1.10) | 2.52(1.01) | 3.15(1.09) | 3.09(1.14) | 3.54(1.03) | 2.90 (1.05) | 3.78 (.73) |

** Consultancy, Administrative office other than government

* Significant at $P < 0.05$ (ANOVA)

Comparison of work satisfaction for pharmacists working in different area of practice indicated that pharmacists working in hospital pharmacy had significantly the lowest overall satisfaction with their main job, with a mean score of 2.52 ± 1.01 while pharmacists working in the category specified as other areas of practice reported the highest overall satisfaction with their main job, with a mean score of 3.78 ± 0.73 . With most items pharmacists working in hospital pharmacy reported the lowest satisfaction score than the other pharmacists. For all the seventeen items of job satisfaction, the analysis shows that there was a statistically significant difference for the pharmacists at different areas of practice except for relation with colleague and fellow professionals (Table 6).

Analysis of job satisfaction item mean score by educational status, marital status and sex indicated that there was no significant difference in satisfaction with the seventeen domains of job satisfaction.

Discussion

The first ever census of pharmacist's practicing in Ethiopia revealed that Ethiopia with the second largest population in Africa (20) had 1,898 actively practicing pharmacists (2.38 pharmacists per 100,000 population). This is by far smaller than the African countries average (8 pharmacists per 100,000 population) and WHO recommended ratio of 1 pharmacist per 2,000 populations (21,22). This shortage of pharmacists could undermine equitable access and availability of medicines to the communities and therefore hamper the reduction of morbidity and mortality (21).

Different studies showed that current developments in pharmacy practice and economic development of countries have driven an increase in pharmacy workforce demand (8,23). Thus, the sustained economic development of Ethiopia expectedly results in health service expansion and the demand for quality of care, which in turn requires more number of pharmacists. In addition, introduction of new patient oriented pharmacy curriculum is expected to boost the demand for pharmacists.

This study also discovered that pharmacists were found unevenly distributed between regions, private and public sectors. For instance, in Afar alone, a remote and underserved region, the density of pharmacist per 100,000 population was 0.66 as compared to Addis Ababa which was 29.88. Despite about 97.3% of Ethiopia population is living outside the capital and 90% of the public hospitals are located in the regional states (24), approximately half (45.9%) of the pharmacists were working in Addis Ababa. This would indicate that majority of the health institutions in the country were running their activities without pharmacists.

A 2009 report of FIP indicated that African region has less than 5% of its workforce employed in the

pharmaceutical industry, in contrast to the South East Asian region where the pharmaceutical industry employed up to 55% of the pharmacist workforce (25). The present investigation also showed that in Ethiopia the least proportion (3.4%) of pharmacists were working in industry like other African countries. This could be an indication that the pharmaceutical industry sector in Ethiopia is still not well developed. Hence, the sector needs more attention as it will offer an incremental boost to the local economy.

The results of the job satisfaction scale indicated that pharmacists in Ethiopia had mean satisfaction scores usually averaged near the neutral point. However, as in other developing countries, pharmacists had lower extent of satisfaction as compared to what was observed by Seston *et al.* among British Pharmacists (12). Ethiopian pharmacists' mean job satisfaction was lower than the Zimbabwean pharmacists, with mean score of 3.81 out of five (26). The finding also showed that older and more experienced pharmacists were more satisfied with their job than the younger and less experienced pharmacists, which mirrors the previous studies done in United Kingdom (12,26,27). Another study done by Noel *et al.* demonstrated that job satisfaction increases with age and young professionals were more likely to be dissatisfied because expectations do not meet real world experience (28).

Similar to research findings done in United Kingdom, the study revealed that pharmacists were least satisfied by the amount of payment they get for their work (12,27). Luboga *et al.* found that salary was a major cause of dissatisfaction among health workers and described it as one of the major factors that motivate workers (29). Generally studies also showed that workers satisfaction be highly correlated with remuneration (30). In United State of America, salary increment was adopted as a strategy to address shortages and this combined with attractive job opportunities led to a subsequent increase in student numbers and the number of graduates (31).

The present study results reinforced earlier findings that job satisfaction varied according to the work settings (32-34). Accordingly pharmacists working in hospitals were significantly less satisfied with their jobs than other pharmacists. This was not expected because previous studies observed different result where community pharmacists were generally less satisfied than their counterparts working in the hospital (12,26,27). One possible explanation to the present finding could be the existing role of pharmacists in the hospital setting mainly focusing on product oriented function. Hence, pharmacists in hospital pharmacies might perceive that they were using their skills to a lesser extent than their peers employed in the other settings. According to Kahaleh and Gaither, the ability to utilize skill was identified as the most important factor in their perception of the ideal job (33). On the contrary, this study

demonstrated that hospital pharmacy was the first large sector employing pharmacists. This highest proportion of pharmacists in hospitals was attributed to the implementation compulsory service years for all healthcare professionals. Generally in an effort to enhance coverage and quality of pharmaceutical services, hospital pharmacy staff needs to feel certain about their future, so pharmacy managers should focus on altering the job to provide greater use of skills and abilities and to provide increased challenge in the work.

Conclusion

From this study it can be concluded that the pharmacist density in Ethiopia is by far lower than African countries average and that of WHO's recommendation. Moreover, there is maldistribution of the available workforce among Regional States/City Administrations where emerging regions do suffer severe shortages. Pharmacists reported slightly higher than the average mean level of job satisfaction score and their level of job satisfaction appeared to significantly vary with age, years of professional work experience and area of practice.

Recommendation

Based on the findings it can be recommended that the government in collaboration with stakeholders should formulate different incentive mechanisms to alleviate the regional maldistribution and improve job satisfaction of pharmacists. Moreover, the government has to devise a system for expansion of the future pharmacist workforce. Future research that aims at assessing the pharmacist workforce should be done on regular intervals and plan should be done accordingly.

Declaration

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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