

Assessment of the pharmacist 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 the pharmacist workforce 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 a stratified random sampling method. A 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 the 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 an 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 was ranked least by the pharmacists. Hospital pharmacists and younger pharmacists were significantly less satisfied than pharmacists working elsewhere.

Conclusion: This study has shown that Ethiopia suffers from shortage of pharmacists and their mal-distribution across regions was also evident. Moreover, job satisfaction of the pharmacists in the country was slightly higher than the average mean satisfaction score on a scale of 1-5. Thus, government and other stakeholders should work together to devise mechanisms that could improve pharmacists' job satisfaction, ease uneven distribution among regions and expand the future pharmacy workforce. [*Ethiop. J. Health Dev.* 2013;27(2):124-133]

Introduction

Health workers have been defined by the World Health Organization (WHO) as people whose job is to protect and improve the health of their communities (1). They are essential elements in the delivery of health services and critical components 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 the 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 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).

A high 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

suffering severely 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 mal-distribution 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 management and leadership (10).

Pharmacists represent the third largest health care professional group in the world. The majority of pharmacists practice in communities, hospitals and other medical facilities. A smaller numbers of them 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, nevertheless, more serious in developing countries. The data collected by the International Pharmaceutical Federation (FIP) revealed that pharmacist density varies widely from less than 5 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).

In Ethiopia, the pharmaceutical sector is guided by a National Drug Policy which was developed in line with

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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 a 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 the considerable growth in the number of pharmaceutical industries and pharmacy schools in the country, these are only limited to nine pharmaceutical industries and nine public universities offering a degree program in pharmacy (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 health care services at all levels. The responsibility of pharmacists has evolved from that of a compounder and supplier of pharmaceutical products to a provider of patient care. The changes in the practice of pharmacy, combined with an aging society with chronic diseases and newly approved medications, made it necessary to significantly expand the pharmacist workforce having the appropriate education and training. However, the role of pharmacists in Ethiopia is still lagging behind. Pharmacists are still working as compounders and suppliers of pharmaceuticals, which is considered as the traditional role of pharmacists. The country also lacks a comprehensive document for the pharmacy workforce. As a result, fundamental questions regarding the status of the pharmacy workforce, its level of performance and the problems its practitioners face remain largely unanswered. Therefore, the aim of this study was to determine pharmacists' density, compare the level of their distribution among regions and assess the level of satisfaction with their jobs so that this would help in critical evaluation of the national pharmacy workforce.

Methods

The study was based on a facility based census and a cross-sectional survey that employed a quantitative method of data collection. It was conducted between May and September, 2010. All pharmacists in Ethiopia that 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 a 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 because of 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 a 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 questionnaires were distributed in Addis Ababa and the rest 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 a 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 records using a data abstraction form. For the cross-sectional survey, a slightly modified version of tools developed by the Royal Pharmaceutical Society of Great Britain and used with pharmacists in the 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 measured overall job satisfaction, other items measured satisfaction with particular aspects of the pharmacists' work and each item was rated on a five-point scale from 1 (very dissatisfied) to 5 (very satisfied). Since all of the statements 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 the Regional Health Bureaus. Written informed consent was obtained from participants after they were briefed about the purpose of the study.

Results**Findings from the Census****Socio-demographic characteristics and pattern of practice:**

The census shows 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, 1,474 (77.6%), was much higher than female pharmacists, 424 (22.4%). The variation in gender composition was also evident within the regions/city administrations 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 (45.9%) of the country's pharmacy workforce was found in Addis Ababa and the lowest (0.3%) in Benishangul Gumuz Regional State.

Regarding the pattern of practice, hospital pharmacy accounted the largest proportion (33.6%) followed by sales and marketing (18.8%) and community pharmacy (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 (30.4%). The proportion of pharmacists working in

industry, academic and research, regulatory and government offices were: 3.4%, 9.1% and 11.5% respectively. Higher proportion of female pharmacists than males were working in hospitals (37.3% versus 32.6%) and community pharmacies (26.4% Vs 16.2%). However, the proportion of male pharmacists was higher in the remaining area of practice, the highest being in sales and marketing (19.3%).

Slightly more than half (53.7%) of the pharmacists in Ethiopia were working in public/government organizations and 745 (39.3%) of them were either working in the private sector or self employed. The rest 134 (7.1%) of the pharmacists were working in NGOs including civic organizations, the Red Cross, multilateral, bilateral and donor agencies that include the UN agencies, the African Union, and the European Union.

Density of pharmacists per 100,000 population:

The highest density of pharmacists was recorded in Addis Ababa (29.88 per 100,000 population) and the lowest was in Afar (0.66 per 100,000 population). The national density was calculated to be 2.38 per 100,000 population (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 of them returned the questionnaire giving a response rate for the survey of 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 were at or below the age of 30 years and most of them, 347(88.3%), had a Bsc in pharmacy. About two-third (64.1%) were single and 136 (34.6%) were married (Table 3).

The average number of years in professional employment as 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 their 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 overall job satisfaction on a 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 calculated to explore the impact of age on degree 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). 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" was ranked first by the older pharmacists with a 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 those with less experience (both < 5years 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 the item "relation with colleague and fellow professionals". Pharmacists with more than 10 years of work experience rated "freedom to choose their own method of working" as first while less experienced pharmacists ranked "relation with colleague and fellow professionals" as the most important item (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 those working in hospital pharmacies 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 pharmacies reported the lowest satisfaction score than the others. For all the 17 items related to job satisfaction, place of work showed a statistically significant difference except for the "relation with colleague and fellow professionals" item (Table 6).

Analysis of job satisfaction item mean score by educational status, marital status and gender showed no significant difference in satisfaction with the all indicators of job satisfaction.

Discussion

According to the present study, Ethiopia, with the second largest population in Africa (20), had 1,898 actively practicing pharmacists (2.38 pharmacists per 100,000 population). This was by far smaller than the average for African countries (8 pharmacists per 100,000 population) and the WHO recommended ratio of 1 pharmacist per 2,000 populations (21, 22). This shortage of pharmacists in Ethiopia could undermine equitable access and availability of medicines and therefore hamper the efforts of improving the health status of the population (21).

Different studies have shown that current developments in pharmacy practice and growth in countries' economies have driven an increase in the demand for more pharmacists (8, 23). Thus, the sustained economic growth in Ethiopia is expected to result in health service expansion and the demand for quality of care that, in turn, requires more pharmacists, among other things. 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 across the regions, the private and public sectors. For instance, in Afar alone, a remote and underserved region, the density of pharmacists was 0.66 per 100,000 population, while it was 29.88 in Addis Ababa. Despite the fact that about 97.3% of Ethiopia's population is living outside the capital and 90% of the public hospitals are located in the regions (24), approximately half (45.9%) of the pharmacists were working in Addis Ababa. This indicates, among other things, that most of the health facilities in the country are running their activities without adequate and qualified pharmacists.

A 2009 report of the International Pharmaceutical Federation (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 pharmacists (25). The present investigation also showed that in Ethiopia the least proportion (3.4%) of pharmacists were working in the industry as in other African countries. This could be an indication that the pharmaceutical industry 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 in the present study showed that pharmacists in Ethiopia had mean satisfaction scores usually averaging near the neutral point. However, as in other developing countries, they had lower level of satisfaction as compared to what was observed by Seston *et al.* among British Pharmacists (12). Ethiopian pharmacists' mean job satisfaction was lower than that of Zimbabweans, with a mean score of 3.81 out of five (26). The finding in the present study also showed that older and more experienced pharmacists were more satisfied with their job than the younger and less experienced ones, which mirrors the results of previous studies from the 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 accord with the real world experience (28).

Similar to the findings of studies in United Kingdom, the present 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 main factors that motivate workers (29). Generally, studies have also shown that workers' job satisfaction to be highly correlated with remuneration (30). In the United State of America, salary increment was adopted as a strategy to address shortages and, this combined with attractive working conditions, led to subsequent increases in student enrollment in pharmacy and the number of graduates (31).

The present study results reinforced earlier findings that job satisfaction varied according to the work environment (32-34). Accordingly pharmacists working in hospitals were significantly less satisfied with their jobs than others. This was not expected because earlier studies had observed different results in which community pharmacists were generally less satisfied than their counterparts working in hospitals (12, 26, 27). One possible explanation for the results of the present study 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 opportunity to use skills fully

was identified as the most important factor in the perception of an ideal job (33). On the contrary, the present study demonstrated that hospital pharmacy was the first large sector employing pharmacists. This highest proportion of pharmacists in hospitals was attributed to the compulsory service requirement for all health care 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 changing the conditions of the job to provide greater use of skills and abilities and increased challenges in the work.

Conclusion

From the present 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 mal-distribution of the available workforce across regional states and 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.

Recommendations

Based on the findings of the present study, it can be recommended that the government, in collaboration with other stakeholders, should formulate different incentive mechanisms to alleviate the regional mal-distribution 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 these should serve as bases for planning the workforce.

Acknowledgments

The authors would like to acknowledge the Office of Graduate Programs at Addis Ababa University and the Ethiopian Pharmaceutical Association for funding this project.

We are also very grateful to the study participants and individuals who helped us during the data collection.

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