Identifying needs for optimizing the health workforce in Ethiopia: with focus on sexual, reproductive, maternal and newborn health services providers

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<tr>
<td>AC</td>
<td>Associate Clinicians</td>
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<tr>
<td>AMCB</td>
<td>American Midwifery Certification Board</td>
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<td>AMDD</td>
<td>Averting Maternal Death and Disability</td>
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<tr>
<td>CPD</td>
<td>Continuing Professional Development</td>
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<tr>
<td>CSA</td>
<td>Central Statistical Agency</td>
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<tr>
<td>EmONC</td>
<td>Emergency Obstetric and Newborn Care</td>
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<tr>
<td>FMOE</td>
<td>Federal Ministry of Education</td>
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<td>FMOH</td>
<td>Federal Ministry of Health</td>
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<tr>
<td>HERQA</td>
<td>Higher Education Relevance and Quality Assurance Agency</td>
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<tr>
<td>HEWs</td>
<td>Health Extension Workers</td>
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<td>HO</td>
<td>Health officer</td>
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<tr>
<td>HIV</td>
<td>Human Immuno-deficiency Virus</td>
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<tr>
<td>HRH</td>
<td>Human Resources for Health</td>
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<tr>
<td>HRM</td>
<td>Human Resource Management</td>
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<tr>
<td>HRIS</td>
<td>Human Resource Information System</td>
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<tr>
<td>ICM</td>
<td>International Confederation of Midwives</td>
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<td>IMCI</td>
<td>Integrated management of childhood illnesses</td>
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<tr>
<td>IST</td>
<td>In-Service Training</td>
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<td>MDGs</td>
<td>Millennium Development Goals</td>
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<td>MMR</td>
<td>Maternal Mortality Ratio</td>
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<td>MSH</td>
<td>Management Sciences for Health</td>
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<tr>
<td>NMR</td>
<td>Neonatal Mortality Rate</td>
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<tr>
<td>ODP</td>
<td>Office for Domestic Preparedness</td>
</tr>
<tr>
<td>OSCE</td>
<td>Objective Structured Clinical Examination</td>
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<tr>
<td>PMTCT</td>
<td>Prevention of Mother to Child Transmission of HIV</td>
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<tr>
<td>PSE</td>
<td>Pre-service Education</td>
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RHB  Regional Health Bureau
SDGs  Sustainable Development Goals
SNNP  Southern Nations, Nationalities and Peoples
SRMNH  Sexual, Reproductive, Maternal, and Newborn health
TVET  Technical and Vocational Education and Training
USAID  United States Agency for International Development
UN  United Nations
UNFPA  United Nations Population Fund
UNICEF  United Nations Children’s Fund
U5MR  Under-five Mortality Rate
VU  Vrije Universiteit
WHO  World Health Organization
CHAPTER 1

General Introduction
Chapter 1: General Introduction

Ethiopia country context

With about 100 million population, Ethiopia is the second most populous country in Africa [1]. In the past two decades, Ethiopia improved its health systems remarkably and achieved most of the Millennium Development Goals (MDGs). Under-five mortality rate (U5MR) fell by two-thirds, the maternal mortality ratio (MMR) decreased by 71.8%, and mortality and morbidity due to HIV, tuberculosis and malaria declined markedly [2-4]. However, the health status of Ethiopians remains poor. Ethiopians die seven years earlier than an average global citizen. Ethiopia has one of the highest mortality levels in the world, with an estimated MMR of 353 per 100,000 live births, U5MR of 59.2 per 1000 live births, and neonatal mortality rate (NMR) of 27.7 per 1000 live births in 2015. The corresponding global average figures were 216 per 100,000 live births, and 42.5 and 19.2 per 1000 live births, showing the higher mortality burden Ethiopians bear. However, Ethiopia fares better compared to the average statistics for Africa. Average life expectancy, MMR, U5MR and NMR for the African region were 60 years, 542 per 100,000 live births, and 81.3 and 28 per 1000 live births, respectively [1].

Why strengthen the health workforce?

It is now accepted that investment in the health workforce is critical to improve health systems and health outcomes. Health workers are the backbone of an effective health system and investing in them is key to making progress towards global health development goals, including achieving universal health coverage and preventing and responding to national and global public health emergencies [5-9]. The realization that number, distribution and quality of health
workers has an impact on healthcare coverage and outcomes led to the establishment of a minimum workforce density [6, 8, 10]. During the MDGs period, WHO estimated that countries needed at least 2.3 doctors, nurses and midwives per 1000 population in order to achieve high coverage with essential interventions (80% skilled birth attendance rate) and meet the health targets for MDGs [6]. The minimum workforce threshold to attain health targets of the Sustainable Development Goals (SDGs) has been revised higher (4.45 doctors, nurses and midwives per 1000 population) as it considers coverage with broader sets of interventions (maternal, newborn and child health, infectious diseases, and non-communicable diseases) [8]. The benefits of strengthening the health workforce are not, however, limited to public health. Investment in the health workforce is likely to contribute to attainment of many other SDGs, including poverty elimination, gender equality, quality education, decent work, and inclusive economic growth [9].

Strengthening human resources for health (HRH) requires improving the health workforce across the four equally important dimensions of availability, accessibility, acceptability, and quality [6-8]. Availability refers to ensuring sufficient supply and stock of health workers to meet the needs or demands and is dependent on pre-service education production capacity, recruitment (employment) efficiency, and turnover of health workers. Accessibility entails equitable distribution of health workers and is affected by the ability to attract, deploy and retain health workers evenly across geographic regions and rural versus urban districts. Accessibility is also affected by health worker absenteeism, costs of getting health care, referral system, and infrastructure design. Acceptability, also known as responsiveness, is concerned with delivering care that meets the socio-cultural expectations of the population, and is
affected by the characteristics, skills mix, cultural competence, communication skills and quality of health workers. Quality refers to the ability of health workers to provide effective care in the context of an enabling environment and is affected by competence and motivation of health workers [6-8, 11]. Competence in turn is influenced by quality of education and availability of performance improvement opportunities while motivation is affected by content of the job, compensation and benefits, management and support systems, recognition and appreciation, professional and career advancement opportunities, working conditions, infrastructure and resources, and living conditions [6, 12]. Figure 1 presents our conceptual framework linking the different thesis components, the four workforce dimensions and health outcomes.

All countries around the world face varying degrees of workforce challenges. Despite improvements in the last decade, the deficiency of health workers is still staggering, estimated at 17.4 million globally in 2013. Africa has the second largest need-based shortage, with a magnitude of 4.2 million health workers. Uneven distribution of health workers between and within countries is also a huge problem [7, 8]. For example, Africa has the lowest density of health workers despite having the highest burden of disease. Within the African region, workforce density varies from 1.6 doctors, nurses and midwives per 10,000 population in Niger to 58.8 in South Africa [1]. Sub-national distributional imbalances between rural and urban, and across geographic regions are also common. The 2013 global health workforce alliance report showed all 25 profiled low, middle, and high income countries had inequitable distribution of physicians at sub-national levels [7].

Although comparable measurements are not available, needs for improving acceptability and quality of the health workforce and health services are also widely recognized. A 2010 Lancet
article on education of health professionals for the 21st century by a global independent commission concluded that current education systems were not adequately preparing health workers for the challenges of the 21st century and called for reform [13]. Three years later, WHO consolidated the call by stating that just training more health workers would not solve health problems of the 21st century, and provided guidelines to transform education and training of health professionals to produce graduates that are responsive to current and evolving health needs of their populations [14].

The gaps in quality and acceptability of care also discussed in the maternal health care literature. Lack of quality and respectful maternity care is a worldwide public health problem, including care that is too little, too late, too much, too soon, or disrespectful. Many women experience mistreatment including poor standards of care, abuse, non-dignified care, neglect, ineffective communication, and lack of supportive care. While the causes for poor quality and disrespectful care are multiple, clinical, interpersonal, and cultural competence of the workforce is vital [15-19].

**The health workforce in Ethiopia**

The evidence base on the health workforce in Ethiopia is limited. There is no reliable human resource information system (HRIS) that can provide complete and up-to-date workforce data [20]. Human resources for health (HRH) studies with a nationally representative sample are rare and their study designs are generally weak. However, available information points to multi-faceted health workforce challenges across the four dimensions [6-8]. It is true that Ethiopia has massively expanded pre-service education of health workers in the last decade. For
example, the number of midwifery schools doubled between 2008 and 2014; and enrollment into medical schools increased more than 20-fold between 2000 and 2015. However, the doctors, nurses, and midwives density per 1000 population is still 0.8 compared to the SDG threshold of 4.45 [20]. While the workforce shortage is largely due to low production capacity, there is also significant attrition. The absence of a reliable HRIS system in Ethiopia makes research on attrition more critical to track turnover and its precursors. A national survey conducted in December 2012 found an annual attrition rate of 30 per 1000 health workers [21]. Outmigration is also a substantial challenge; older estimates suggested 17%-30% of physicians had migrated [6, 22].

The shortage is also exacerbated by distributional imbalances across regions and rural versus urban areas. There is huge regional disparity in workforce density; the workforce density in Harari Region is four times higher than in Somali Region [20]. Uneven distribution is also worsened by attrition. For example, a 2012 survey showed that Somali Region, which had the lowest density in recent estimates, also had the highest annual attrition rate (170 per 1000), more than 5 times the national average [20, 21]. Urban/rural distribution is also a problem, data from 2008 showing 37% of doctors in the public sector worked in the capital Addis Ababa, although only 4% of the Ethiopian population lived there [22]. Another study found that only 36% of nurses and 17% of doctors worked in rural locations although more than 80% of Ethiopia’s population lived in rural areas [23]. In fact, the emphasis on improving equity of healthcare as a core goal of the current health sector transformation plan is a veritable acknowledgement of the gaps in the distribution of health services and, by extension, health workers [2].
With regard to acceptability, available evidence shows the importance of culture and tradition in maternal health care and gaps in provision of care that meets socio-cultural expectations of women and their families. Demographic and health surveys consistently showed that about a third of Ethiopian women mention custom as a reason for not delivering in a health facility [24, 25]. A literature review also found that cultural and traditional practices are valuable elements of childbirth tradition in Ethiopia and present barriers to seeking maternal health care [26]. Perhaps more tellingly, the Federal Ministry of Health (FMOH) adopted “creating a compassionate, respectful, and caring workforce” as one of the four transformation agendas in the current health sector transformation plan, in response to growing public dissatisfaction with lack of compassion, respect, effective communication, and patient-centered care [2].

Improving quality is also a key priority in Ethiopia’s current health and education sector plans [2, 27]. While scaling up pre-service education has been effective in alleviating the shortage of health workers, raising the doctors, nurses and midwives density from 0.25 to 0.8, the rapid expansion has stretched the capacity to maintain quality of education [6, 20, 21, 28, 29]. A baseline survey conducted by the Strengthening Human Resources for Health Project in 2012 involving 42 public health science colleges uncovered several capacity gaps. A majority of instructors did not have postgraduate qualifications and training on effective teaching/learning methods. Infrastructure was insufficient to support the expanded student numbers. And internal quality assurance systems were underdeveloped [21]. Assessment of private health science colleges in the same year also revealed similar challenges [28]. A strategic document to revitalize quality of health professionals’ education co-sponsored by the Higher Education Relevance and Quality Assurance Agency (HERQA) and FMOH identified weaknesses in health
professionals’ education regulation; namely, public higher education institutions were not subject to accreditation; capacity and mandate of the regulatory agency to enforce quality audit recommendations was limited; and there was no national licensing exams for university graduates [30]. Further evidence comes from work place studies conducted between 2008 and 2013, which reported major competence gaps in providing maternal care among general practitioners, health officers, nurses, and midwives [22, 31].

Competence, however, is a necessary but not sufficient condition for effective health worker performance. Health workers need to be motivated and work in adequately-resourced environments to provide quality services and save lives [6]. However, albeit the sample was small, a 2007 World Bank study found that Ethiopia’s doctors were unsatisfied with most aspects of their job especially salary, training and career advancement opportunities, and physical conditions of the facility [23]. Although representation of doctors and associate clinicians in the sample was negligible, a three-round survey in 2003, 2006 and 2009 with a convenience sample of primary health care facilities in four regions also demonstrated that public sector health workers had consistently low satisfaction with financial rewards and resource availability [32].

The multi-faceted HRH challenges in Ethiopia are compounded by weak human resource management (HRM) capacity. Two recent assessments showed that HRM units at all levels of the health system were not adequately staffed; staff satisfaction levels were not monitored; complete and up-to-date workforce data were lacking; and a performance management system was not practiced [21, 33].
While the challenges are many and complex, the Government of Ethiopia with support from development partners has made massive investments in its health workforce in the last decade and continues to do so. Ethiopia trained and deployed tens of thousands of health extension workers (HEWs) to provide basic health care services to its large rural population. It trained more than 5000 health officers (also known as associate clinicians or non-physician clinicians or clinical officers or medical officers in other parts of the world) to alleviate the shortage of physicians. More recently, it expanded midwifery, medicine and anesthesia training by opening new schools and increasing annual enrollment rates. The current health sector transformation plan has also identified movement towards a compassionate, respectful and caring workforce, and quality and equitable healthcare as top priorities [2, 20].

Since 2012, the USAID-funded Strengthening Human Resources for Health Project has been supporting the efforts of the Government of Ethiopia to improve HRH management, increase availability of health workers (including midwives, anesthetists, and HEWs), improve quality of pre-service education and in-service training of health workers, and generate evidence on critical HRH issues [34]. Efforts to improve Ethiopia’s health workforce and the health of its population are more likely to be effective and efficient if HRH policies and programs are informed by research evidence.

The aim of this thesis is, therefore, to identify needs for optimizing Ethiopia’s rapidly developing health workforce. Four of the five studies (chapters 2, 3, 4 and 6) are based on implementation studies conducted by the HRH Project. Implementation research in the context of health is defined as a scientific inquiry into questions regarding implementation of health policies, programs and practices. Implementation research aims to improve implementation (in this
case health workforce education, practice and management), addresses issues important to implementers (in this case to Ministry of Health and education institutions), promotes active involvement of people working in the field (in this case relevant experts and leaders at Ministry of Health), and pays attention to the context [35, 36].

**Brief description of the PhD thesis**

This monograph is one of three PhD theses coming from implementation studies conducted by the HRH Project. The aim of this particular PhD thesis is to identify needs for optimizing the health workforce in Ethiopia across the availability, accessibility, acceptability, and quality dimensions. The focus is on health workers who are the primary providers of sexual, reproductive, maternal, and newborn health (SRMNH) services [37]. These are the specific research questions:

1. **How is the quality of pre-service midwifery education in public higher education institutions? Are the learning inputs, processes and outputs sufficient? Do students attain essential competencies?** (chapter 2)

2. **What tasks are recently qualified midwives doing? How often do they perform those tasks? How do they perceive the criticality of those tasks? How competent are they in those tasks? Where and when did they learn to perform those tasks?** (chapter 3)

3. **What is the quality of midwife-provided intrapartum care in Amhara Region? Are midwives competent in providing intrapartum care? Do health facilities have the basic infrastructure and physical resources for quality care? How conducive is the working environment for performance and quality improvement?** (chapter 4)
4. Are maternal healthcare providers in Bahir Dar City culturally competent? (chapter 5)

5. What is the level of satisfaction, motivation, turnover intention of physicians and associate clinicians in the public health sector? Which factors influence satisfaction and turnover intention? Are there differences between physicians and associate clinicians? (chapter 6)

The relationship between the different studies and the workforce dimensions are shown in the conceptual framework (Figure 1). The following studies are components of the thesis.

1. **How well does pre-service education prepare midwives for practice: competence assessment of midwifery students at the point of graduation in Ethiopia (chapter 2)**

Countries like Ethiopia need more health workers to achieve universal health coverage. But efforts to increase the quantity of health workers must also ensure quality and relevance of education [14]. Ethiopia has made encouraging progress in scaling up pre-service education of health workers including increase of public midwifery schools from 23 in 2008 to 49 in 2014. But concerns have been raised about erosion of quality of education. The HRH Project supported efforts of the Government to increase availability of midwives and improve quality of pre-service education. This cross-sectional study was conducted to assess quality of midwifery education with a nationally representative sample of final year students at their point of graduation. Specifically, the study evaluated attainment of competencies using objective structured clinical examination (OSCE) and quality of educational inputs and learning experiences using structured interviews with students.
2. Using task analysis to generate evidence for strengthening midwifery education, practice and regulation in Ethiopia (chapter 3)

Periodic task analysis studies can provide empirical data to design and review scope of practice, pre-service and in-service training curricula, licensing exam, and deployment of health workers [38]. The HRH Project supported the efforts of the Government of Ethiopia to improve quality of pre-service education, standardize in-service training, establish continuing professional development system, and strengthen health professionals’ regulatory system. We conducted a cross-sectional task analysis study with midwives in practice to identify priorities for pre-service education strengthening, in-service training, and national licensing exam. Purposively selected midwives working in seven regions of Ethiopia were asked to make judgements about criticality, frequency of performance, competence, and place and timing of training for a validated list of tasks.

3. Quality of midwife-provided intrapartum care in Amhara Regional State, Ethiopia (chapter 4)

Quality of labor, delivery and immediate postpartum care is highly consequential for the mother and her child [39]. Despite expansion of the midwifery workforce and health facilities, skilled birth attendance remained low, raising suspicion that poor quality of care may be partially to blame. The HRH Project supported the efforts of the Government of Ethiopia to increase availability and quality of midwives with the ultimate purpose of reducing maternal and newborn mortality and morbidity. This study was conducted to assess quality of midwife-provided intrapartum care in Amhara National Regional State, the second most populous region
in Ethiopia. Specifically, we assessed competence of midwives in providing intrapartum care through direct observation. We also assessed availability of essential resources and performance improvement opportunities for provision of quality care.

4. **Cultural competence among maternal healthcare providers in Bahir Dar City Administration, Northwest Ethiopia: cross-sectional study (chapter 5)**

Cultural competence is a relatively new topic but has become increasingly important because of the realization that healthcare, which does not consider and respond to socio-cultural expectations of individuals, families, communities and populations is less likely to be utilized (perpetuating health inequity) and to be effective (perpetuating high mortality and morbidity) [7, 8, 40]. Research evidence from Ethiopia has also shown that cultural practices are important in childbirth traditions and may be acting as barriers to maternal healthcare utilization [24-26]. Cultural competence is defined as the ability of health service providers to effectively deliver health care services that meet the social, cultural, and linguistic needs of clients or patients [40]. We conducted this cross-sectional study to assess the cultural competence of maternal healthcare providers in Bahir Dar City, northwest Ethiopia. This was supplemented with in-depth interviews with women who received maternal healthcare services.

5. **Satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector: a national comparative cross-sectional study (chapter 6)**

Improving equity and quality of healthcare, and creating compassionate, respectful and caring health workers are top priorities of Ethiopia’s health sector. However, unsatisfied and
unmotivated health workers are less likely to provide safe and quality care, satisfy patients, and stay in their current job, affecting availability, accessibility, acceptability and quality of healthcare services [41-47]. The HRH Project supported the efforts of the Government of Ethiopia to improve motivation and retention of health workers. This cross-sectional survey was conducted with a nationally representative sample of physicians and associate clinicians in the public health sector to assess and compare the state and determinants of job satisfaction, motivation, and turnover intention.
3. Quality of midwife provided intra-partum care in Amhara Regional State, Ethiopia

2. Using task analysis to generate evidence for strengthening midwifery education, practice, and regulation in Ethiopia

1. How well does pre-service education prepare midwives for practice: competence assessment of midwifery students at point of graduation in Ethiopia

4. Cultural competence among maternal healthcare providers in Bahir Dar City Administration, Northwest Ethiopia: cross-sectional Study

5. Satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector: a national comparative cross-sectional study

Favorable health systems, and social, economic, and political contexts

Improves health services and health outcomes

Optimizing

Availability of the health workforce (function of production and retention)

Accessibility of the health workforce (function of deployment, attraction, and retention)

Acceptability of the health workforce (function of profile, skills, cultural competence, and motivation of health workers)

Quality of performance of the health workforce (function of competence, motivation, and enabling environment)

Thesis components
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CHAPTER 2

How well does pre-service education prepare midwives for practice: competence assessment of midwifery students at the point of graduation in Ethiopia?

How well does pre-service education prepare midwives for practice: competence assessment of midwifery students at the point of graduation in Ethiopia

Tegbar Yigzaw¹, Firew Ayalew¹, Young-Mi Kim², Mintwab Gelagay¹, Daniel Dejene¹, Hannah Gibson¹, Aster Teshome³, Jacqueline Broerse⁴ and Jelle Stekelenburg⁵

Abstract

Background: Midwifery support and care led by midwives is the most appropriate strategy to improve maternal and newborn health. The Government of Ethiopia has recently improved the availability of midwives by scaling up pre-service education. However, the extent to which graduating students acquire core competencies for safe and effective practice is not known. The purpose of this study was to evaluate the quality of midwifery education by assessing the competence of graduating midwifery students.

Methods: We conducted a cross-sectional study to assess the competence of students who completed basic midwifery education in Ethiopia in 2013. We interviewed students to obtain their perceptions of the sufficiency and quality of teachers and educational resources and processes. We assessed achievement of essential midwifery competencies through direct observation, using a 10-station Objective Structured Clinical Examination (OSCE). We calculated average percentage scores of performance for each station and an average summary score for all stations. Chi-square test, independent sample t test, and linear regression analysis were used to assess the statistical significance of differences and associations.

Results: We assessed 484 graduating students from 25 public training institutions. Majority of students rated the learning environment unfavorably on 8 out of 10 questions. Only 32% of students managed 20 or more births during training, and just 6% managed 40 or more births. Students’ overall average competence score was 51.8%; scores ranged from 32.2% for manual vacuum aspiration to 69.4% for active management of the third stage of labor. Male gender, reporting sufficient clinical experience, and managing greater numbers of births during training were significant predictors of higher competence scores.

Conclusions: The quality of pre-service midwifery education needs to be improved, including strengthening of the learning environment and quality assurance systems. In-service training and mentoring to fill competence gaps of new graduates is also essential.

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Background

Ethiopia has made impressive progress towards Millennium Development Goal 4: it is one of seven high mortality countries that have reduced under-five mortality by two-thirds or more before the 2015 deadline [1]. However, absolute levels of maternal and newborn mortality remain high. The 2011 Ethiopia Demographic and Health Survey reported a maternal mortality ratio (MMR) of 676 deaths per 100,000 live births and a neonatal mortality rate (NMR) of 37 deaths per 1000 live births [2].

Now more than ever there is a global consensus regarding the contribution of midwifery care and midwives to reduce maternal and newborn mortality. Competent midwives can provide 87 % of essential care needed for women and newborns and universal coverage with quality midwifery care can prevent more than 80 % of maternal and newborn deaths [3–5].

However, skilled care coverage in Ethiopia is low with only 10 % of births assisted by a doctor, nurse, or midwife [2], which is extremely low even by the standards of sub-Saharan Africa [6]. A shortage of midwives has been an important bottleneck to increasing skilled midwifery care and, consequently, to improving maternal and newborn health outcomes in Ethiopia. In fact, the midwifery workforce including midwives is estimated to meet only 32 % of the need for maternal and newborn health care in Ethiopia, leaving the needs of the vast majority of women and their children unaddressed [5].

Ethiopia had only 0.3 doctors, nurses and midwives per 1000 population when the World Health Organization identified a workforce threshold of 2.3 per 1000 population to achieve high coverage with essential interventions, including those necessary to meet health millennium development goals in 2006 [7]. Since then the Government of Ethiopia has invested in pre-service education to increase availability of the midwifery workforce. It expanded direct entry diploma and degree programs and in 2011 launched an accelerated midwifery training initiative that provided a one-year post-basic training program for diploma-level nurses. As a result of the rapid scale-up of pre-service education, the number of midwives in Ethiopia has increased markedly in recent years, rising from 1275 in 2008 [8] to 6925 in 2014 [5]. But availability of midwives may not translate into improved maternal and newborn health outcomes unless we ensure midwives master the essential knowledge, skills, and attitudes during their pre-service education [3]. This is potentially a challenge in Ethiopia, given high student enrollment, a shortage of qualified faculty, resource constraints, and low caseloads and questionable quality of care at clinical training sites [9–11].

The objective of this study is to generate evidence on the quality of midwifery education by assessing competence of students at the point of graduation. Research on the competence of graduating midwifery students contributes to the much needed evidence base on midwifery workforce development in Africa. It is particularly important for local training institutions to review and improve the quality of pre-service education. The Ethiopian Ministry of Health and Midwifery Association can also use it to identify priority health workforce strengthening strategies.

Methods

Study design and sample

This paper reports baseline information on the competence of midwifery students at the point of graduation from public training institutions. It is part of a larger evaluation study that will employ a pre-post design to assess changes in competence levels as a result of technical assistance by the USAID-funded Strengthening Human Resources for Health Project to increase availability of competent midwives. At the time of this baseline study, 20 public universities and 22 public TVET (technical and vocational education and training) colleges offered pre-service education for midwives. All 22 TVET colleges and 8 (out of 20) universities had a graduating class in 2013. Eight universities and 17 TVET colleges were included in this study. Five TVET colleges were excluded because of inaccessibility, inadequate information on graduation status or decision to shut down the program.

A total of 2340 midwifery students (1988 from TVET colleges and 352 from universities) were expected to graduate from these 25 training institutions in 2013. Separate representative samples were calculated for university (185) and TVET (326) programs with assumptions of 95 % level of confidence, 80 % statistical power, 44 % competence level (adopted from a 2008 national emergency obstetric and newborn care survey [11] that reported knowledge score of midwives in maternal care and we selected the score that yielded the largest sample size), 10 % expected increment, and design effect of 1. We randomly selected 20 students per TVET college and 24 students per university from the registrar lists to participate in the study. Of these 532 students, 484 students (336 from TVET colleges and 148 from universities) participated in the study. The average number of participants at each institution was 18.5 (range: 7–24) for universities and 19.7 (range: 18–20) for TVET colleges. The main reasons for relatively lower participation from universities were the inability to recall students after they completed their exams and the overlap of the data collection schedule with student preparations for graduation.

Data collection

Data were collected in June/July 2013 from students who completed their education through interview and direct observation of performance. Data collectors interviewed
students privately to obtain information on their background characteristics and perceptions of whether instructors, resources, and infrastructure were adequate and effective using a three-point scale (yes, partially, no). Students were also asked to report how many births they attended during training.

After the interview, the competence of students was assessed using an Objective Structured Clinical Examination (OSCE), a testing format widely believed to generate valid and reliable conclusions [12–15]. The content of the OSCE was drawn from the essential competencies for basic midwifery practice defined by the International Confederation of Midwives (ICM), which serve as expected outcomes of pre-service education [16]. Three additional competencies (3rd, 5th and 10th tasks below) were tested based on national needs. We mapped out 10 OSCE stations, or tasks, from these competencies. Each task consisted of 5 to 13 skills steps. The 10 OSCE stations were: 1) assisting normal delivery, 2) active management of the third stage of labor, 3) vacuum-assisted delivery, 4) history taking in providing focused antenatal care, 5) manual vacuum aspiration, 6) newborn resuscitation, 7) partograph interpretation, 8) postpartum counseling, 9) applying medical eligibility criteria for family planning provision, and 10) integrated management of childhood illness (IMCI). At each manned OSCE station, the assessor explained the assessment process to the student, provided a case scenario, and asked the student to perform the task, either with a mannequin and/or a simulated patient. The assessor observed and noted whether the student satisfactorily performed each step in the observation checklist for that OSCE station. Each student rotated through all 10 OSCE stations and spent 10 min at each station. Senior midwives with experience in performance assessment administered the assessment. Prior to deployment, they attended a five day training, which covered conducting the OSCE, interviewing skill, obtaining informed consent, maintaining confidentiality, and pre-testing of instruments. Assessors validated the content and tools of the OSCE thoroughly during the training. We ensured midwifery instructors were not assigned to their own training institutions and supervisors closely monitored the data collection process.

**Data analysis**

We used the Census and Survey Processing System Program (CSPro Version 5.0) for data entry and SPSS Version 20 for statistical analysis including descriptive (proportion, mean, range) and analytic statistics (Chi-square test, independent sample t-test, linear regression). For the competence assessment, we performed reliability scale analysis to examine the consistency or redundancy of items within each task or station. The internal reliability of items was found to be acceptable (ranging from 0.61 for the family planning station to 0.86 for the newborn resuscitation station), with 7 of the 10 stations having Cronbach alpha values of 0.7 or more.

To evaluate student perceptions of the learning environment, we calculated the percentage of students who responded “yes” to questions about the adequacy and effectiveness of the educational resources and instructors at their training institution and clinical practicum sites. We also calculated the percentage of students who met minimum national and global standards [17] for the number of births attended while in training (20 and 40 births, respectively).

To measure level of competence, we calculated the percentage of steps that students completed satisfactorily at each OSCE station. Mean scores for each station were averaged to create a summary score for overall competence; each of the 10 tasks or OSCE stations contributed equally to this summary score. To judge whether students would be considered competent by national standards, we also calculated the proportion of study participants who scored 60 % or higher- the passing mark for professional courses in Ethiopian higher education institutions.

The Chi-square test was used to assess difference in gender distribution of students between university and TVET programs as well as difference in meeting national standards for number of births assisted during training by type of educational program. We applied independent sample t-test to assess difference in competence scores across gender and type of education programs. Bivariate and multivariate linear regression analyses were used to identify factors associated with achievement of competence. These included student’s gender and age; type of educational program; student perceptions of resources and learning in the classroom, the skills lab, and clinical practicum sites; and the number of births attended during training. We computed coefficients with 95 % confidence interval (CI). Independent variables with p-values less than 0.3 in the bivariate analysis were selected for multivariate linear regression. A p-value of less than 0.05 was considered statically significant. We checked statistical modeling assumptions (outliers, linearity, normality, homoscedasticity, and multicollinearity of the data) before carrying out statistical tests, and we found no violations.

**Ethical considerations**

The study was approved by the Johns Hopkins School of Public Health Institutional Review Board. We obtained oral informed consent from participating students and permission from deans of the training institutions before collecting data.
Results

Description of study participants

A total of 484 students graduating from 25 pre-service midwifery education institutions participated in the study, yielding an overall response rate of 91%. The response rate was 98.8% for technical and vocational education and training (TVET) and 77.1% for university students. Of these, 217 (44.8%) were graduating from direct entry TVET programs, 119 (24.6%) from post-basic TVET programs, and 148 (30.6%) from university programs. Females accounted for 64.9% of all study participants; females were more likely to be enrolled in TVET (74.5%) than in university program (42.6%) (Pearson chi-square = 46.56, degree of freedom = 1, p < 0.001). The mean age of study participants was 21.7 years, and the youngest and the oldest were 18 and 30 years, respectively. Overview of midwifery education programs in Ethiopia is provided in Table 1.

Perceptions of study participants about the learning environment

On 8 of 10 questions, most students rated the learning environment negatively. Only 44.6% of students felt skills lab assistants were effective in supporting students, and 28.9% thought their number was adequate. Clinical preceptors received the lowest ratings: only one in five students said they were adequate (19.2%) and available to support students at practice sites (21.5%). Students rated the availability and helpfulness of resources more highly in the classroom than in the skills lab (43.8% and 28.3%, respectively). Classroom instructors received a more favorable assessment: over half of students thought classroom instructors were effective (56.2%) and fair (67.4%). University students were less likely than TVET students to be satisfied with the learning environment (p < 0.001). However, perceptions of the learning environment did not significantly differ between direct entry and post-basic TVET students, except for classroom resources and the adequacy of preceptors at practice sites (Table 2).

Only 32% of all students had attended 20 or more births (a national standard) and a much smaller 6% had attended 40 or more births under supervision. University students were almost twice as likely as TVET students to meet the national standard of assisting at least 20 births (45.3% and 26.2%, respectively, Pearson chi-square = 17.18, degree of freedom = 1, p < 0.001) (Fig. 1). Likewise, post-basic TVET students were more than three times as likely as direct entry TVET students to meet the national standard (48.4% and 13.8%, respectively, Pearson chi-square = 48.5, degree of freedom = 1, p < 0.001). The median number of births attended by study participants was 11; and 20 students (4.1%) did not report attending even a single delivery during training.

Achievement of core competencies

Student performance varied widely across OSCE stations (Fig. 2). Students performed relatively well in active management of the third stage of labor (69.4%), clinical decision-making skills in family planning service provision (67.1%), assisting normal delivery (66.1%), and postpartum counseling (63.4%). The lowest performance was recorded for manual vacuum aspiration (32.2%) and vacuum assisted delivery (36.5%) tasks. The summary score reflecting average performance across all ten OSCE stations was 51.8%. Moreover, only 31.6% of students had an overall performance score that was equal to or greater than the national passing standard of 60%.

Gender and type of educational program appear to influence achievement of specific competencies. Male students scored significantly higher than their female counterparts in majority of the stations; namely, family planning, antenatal care, partograph, vacuum assisted delivery, manual vacuum aspiration, and integrated management of childhood illness. University students significantly outperformed TVET students in five OSCE stations: vacuum assisted delivery, manual vacuum aspiration, partograph interpretation, family planning, and integrated management of childhood illness. The converse was true for three stations: assisting normal delivery, active management of the third stage of labor, and newborn resuscitation. In the context of TVET colleges, students in direct entry programs performed significantly better than students in post-basic programs in three stations (vacuum assisted delivery, newborn resuscitation, and partograph interpretation), while post-basic students outperformed

<table>
<thead>
<tr>
<th>Type of education program</th>
<th>Qualification</th>
<th>Duration</th>
<th>Curriculum</th>
<th>Entry requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Entry TVET (Technical and Vocational Education and Training) program</td>
<td>Diploma</td>
<td>3 years</td>
<td>Competency-based curriculum</td>
<td>Successful completion of 10 years of education plus fulfilling entrance requirement for TVET set by the Ministry of Education</td>
</tr>
<tr>
<td>Post-basic TVET (Technical and Vocational Education and Training) program</td>
<td>Diploma</td>
<td>1 year</td>
<td>Competency-based curriculum</td>
<td>Successful completion of 3 years of diploma nursing education</td>
</tr>
<tr>
<td>University program</td>
<td>Degree</td>
<td>4 years</td>
<td>Subject-based curriculum</td>
<td>Successful completion of 12 years of education plus fulfilling entrance requirement for higher education set by the Ministry of Education</td>
</tr>
</tbody>
</table>
Factors associated with achievement of core competencies

Bivariate linear regression analysis found that five factors were significantly and positively associated with student performance on the OSCE: male gender, older age, attending more births during training, perceived availability of skills lab resources, and perceived sufficiency of clinical learning experience. The type of educational program and other elements of the learning environment were not associated with student competence (Table 4).
Three of these five factors remained significant in the multivariate analysis: gender, number of attended births, and sufficient clinical learning experience. Instructors’ effectiveness in facilitating learning also proved to be significant (though negatively) in the multivariate model. The two strongest factors were gender and clinical experience. The average performance score of male students was higher than their female counterparts by 5.429 points (95% CI = 2.517, 8.341; \( p < 0.001 \)), after controlling for the effects of other variables. The average score of students who said they had enough clinical experience to master midwifery competencies was higher by 4.65 points (95% CI = 1.863, 7.437, \( p = 0.001 \)). For each additional birth attended, students’ average performance score increased by 0.164 points (95% CI = 0.055, 0.273; \( p = 0.003 \)). Surprisingly, students who said classroom instructors were effective in facilitating learning had lower scores, by a factor of 3.543 (95% CI = −6.360, −0.726; \( p = 0.014 \)).

**Discussion**

Midwifery support and care particularly one led my midwives working in the context of collaborative interdisciplinary team and integrated health system can improve health outcomes for women and infants and be very cost-effective. However, the effectiveness of midwives to do so at least partly depends on the quality of

### Table 3: Mean performance score at each OSCE station, by gender and education program

<table>
<thead>
<tr>
<th>OSCE station</th>
<th>Gender</th>
<th>Training program</th>
<th>P-value*</th>
<th>TVET program</th>
<th>University program</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (n = 170)</td>
<td>Female (n = 314)</td>
<td></td>
<td>Post-basic (n = 119)</td>
<td>Direct entry (n = 217)</td>
<td>ALL TVET (n = 336)</td>
</tr>
<tr>
<td>Assisting normal delivery</td>
<td>65.6</td>
<td>66.4</td>
<td>0.715</td>
<td>67.8</td>
<td>72.6</td>
<td>70.9</td>
</tr>
<tr>
<td>Active management of 3rd stage of labor</td>
<td>69.4</td>
<td>69.3</td>
<td>0.968</td>
<td>72.9</td>
<td>71.0</td>
<td>71.7</td>
</tr>
<tr>
<td>Vacuum assisted delivery</td>
<td>44.9</td>
<td>31.8</td>
<td>&lt;0.001</td>
<td>32.2</td>
<td>35.8</td>
<td>34.5</td>
</tr>
<tr>
<td>ANC history taking</td>
<td>50.4</td>
<td>42.6</td>
<td>0.001</td>
<td>45.0</td>
<td>46.6</td>
<td>46.0</td>
</tr>
<tr>
<td>Manual vacuum aspiration</td>
<td>35.5</td>
<td>30.4</td>
<td>0.048</td>
<td>25.5</td>
<td>32.4</td>
<td>29.9</td>
</tr>
<tr>
<td>Newborn resuscitation</td>
<td>53.6</td>
<td>51.2</td>
<td>0.042</td>
<td>50.0</td>
<td>58.1</td>
<td>55.2</td>
</tr>
<tr>
<td>Partograph interpretation</td>
<td>50.0</td>
<td>41.6</td>
<td>0.003</td>
<td>33.4</td>
<td>41.1</td>
<td>38.4</td>
</tr>
<tr>
<td>Postpartum counseling</td>
<td>64.2</td>
<td>63.0</td>
<td>0.570</td>
<td>65.7</td>
<td>63.9</td>
<td>64.5</td>
</tr>
<tr>
<td>Applying medical eligibility criteria in family planning provision</td>
<td>71.8</td>
<td>64.5</td>
<td>0.005</td>
<td>61.8</td>
<td>66.6</td>
<td>64.9</td>
</tr>
<tr>
<td>Integrated management of childhood illness</td>
<td>49.5</td>
<td>36.9</td>
<td>&lt;0.001</td>
<td>43.6</td>
<td>37.5</td>
<td>39.7</td>
</tr>
</tbody>
</table>

*P-value computed using independent sample t-test
Table 4 Bivariate and multivariate linear regression analysis of factors associated with competence score of study participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate linear regression</th>
<th>Multivariate linear regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (95% CI)</td>
<td>P-value</td>
</tr>
<tr>
<td>Male gender</td>
<td>5.707 (2.887, 8.526)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age (in years)</td>
<td>0.988 (0.297, 1.679)</td>
<td>0.005</td>
</tr>
<tr>
<td>University educational program</td>
<td>0.716 (−2.252, 3.684)</td>
<td>0.636</td>
</tr>
<tr>
<td>Number of births managed during training</td>
<td>0.183 (0.074, 0.291)</td>
<td>0.001</td>
</tr>
<tr>
<td>Felt classroom resources were available and helpful</td>
<td>−0.131 (−2.888, 2.626)</td>
<td>0.926</td>
</tr>
<tr>
<td>Felt number of instructors was adequate</td>
<td>2.191 (−0.565, 4.947)</td>
<td>0.119</td>
</tr>
<tr>
<td>Felt instructors were effective in facilitating learning</td>
<td>−2.469 (−5.217, 0.278)</td>
<td>0.078</td>
</tr>
<tr>
<td>Felt instructors were fair and unbiased in assessing</td>
<td>−2.742 (−5.648, 0.164)</td>
<td>0.064</td>
</tr>
<tr>
<td>Felt skills lab resources were available and helpful</td>
<td>3.593 (0.574, 6.612)</td>
<td>0.020</td>
</tr>
<tr>
<td>Felt number of skills lab assistants was adequate</td>
<td>2.835 (−0.171, 5.840)</td>
<td>0.064</td>
</tr>
<tr>
<td>Felt skills lab assistants supported students effectively</td>
<td>0.073 (−2.678, 2.824)</td>
<td>0.959</td>
</tr>
<tr>
<td>Felt number of preceptors was adequate</td>
<td>2.070 (−1.254, 5.395)</td>
<td>0.222</td>
</tr>
<tr>
<td>Felt clinical teachers and preceptors supported students</td>
<td>1.892 (−1.575, 5.359)</td>
<td>0.284</td>
</tr>
<tr>
<td>Felt clinical experience was sufficient</td>
<td>4.619 (1.915, 7.323)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

their educational preparation [3–5]. This study sought to verify the quality of midwifery education by assessing competence of midwifery students at graduation level against the ICM essential competencies for basic midwifery practice [16] and local health service needs. We found that the mean performance score was unsatisfactory and that most midwifery students at public training institutions in Ethiopia did not master the essential competencies for safe and effective practice. This raises important concerns regarding the quality of pre-service education. Performance scores were lowest for basic emergency obstetric skills of vacuum assisted delivery and manual vacuum aspiration, notwithstanding the importance of prolonged/obstructed labor and unsafe abortion as leading causes of maternal death in Ethiopia [18]. Our findings are similar to the few published studies assessing the competence of newly qualified midwives and nurses. In Afghanistan, a study evaluated six core competencies of midwives 2.6 years after they were deployed to their workplaces by observing their performance with anatomical models. Midwives working at rural clinics scored 63.2 % and those at hospitals scored 57.3 %, suggesting that pre-service education in Afghanistan did not fully prepare students [19]. A small study of newly qualified registered nurses at two South African hospitals also reported that recently graduated nurses were not competent, with an average performance score of 34.05 % [20]. In the United Kingdom (UK), a longitudinal qualitative study that evaluated the preparedness of newly qualified midwives to provide clinical care found that newly qualified midwives lacked confidence in key areas and suggested the presence of gaps in the curriculum [21].

Our findings on the learning environment, while subjective, confirm widespread problems with quality and adequacy of teachers, educational resources, and the teaching and learning process, which are essential for quality pre-service education [22–27]. The practical learning experience was particularly deficient, typified by the small number of births managed by students. In this study, each midwifery student managed 11 births, on average, compared with the national standard of 20 births and the global standard of 40 births [17]. This is important because we also found that students who reported sufficient clinical experience and assisted greater number of births had higher competence scores. However, the availability of teachers and educational resources as well as perceived effectiveness of teachers’ support for practical learning was not associated with student competence in this study. Even more surprising, students who perceived their classroom teachers to be effective in facilitating learning scored lower on the OSCE, warranting further exploration. One possible explanation is that students who rate classroom teachers favorably may do so because they are more comfortable with theoretical learning but less so with practical learning and competence. But these findings must be interpreted cautiously, given the inherent challenges of interpreting self-reported answers.

Our study found that male students achieved a higher competence than their female counterparts. This contradicts research reports from around the world. An integrative literature review by Johnson and colleagues [22] concluded that gender did not contribute to academic performance. In contrast, a series of studies that have investigated the effect of gender on the academic success
of nursing students [28], clinical performance of medical students [29, 30], and clinical knowledge [31] and communication and interpersonal skills [32] of examinees in the United States Medical Licensure Examination have all concluded that women are better performers. The inferior performance of women in our study perhaps reveals the inadequacies of affirmative action program in the Ethiopian education system introduced to redress the considerable gender gap. Although affirmative action provides female students preferential admission to tertiary educational programs with lower grades [33], our finding raises questions about the availability and adequacy of academic support to help them succeed once they are enrolled.

Even though there was no difference in the overall competence between university and TVET students, TVET students outperformed on some tasks, while university students outperformed on others. This suggests that the two programs have different strengths and weaknesses. While there are no contemporary studies comparing vocational and university education programs [22], our finding is in agreement with a study from the UK that compared nurses prepared through diploma and degree programs. The UK study found little difference in overall and specific competencies between the two groups, based on self- and manager ratings [34].

Implications
There is no doubt that midwifery services and midwives are crucial to the achievement of national and international goals in reproductive, maternal, newborn and child health, now and beyond 2015 [4]. However, the likelihood that most students were allowed to graduate without ensuring their competence warrants action. The competence, and consequently performance of health workers, has an immediate impact on the quality of health care and population health outcomes [7]. Allowing incompetent midwives to enter the workforce without remediation compromises patient safety, undermines public confidence in the health system, and makes it difficult to meet national goals for improving maternal and newborn health. It also undermines the status of the profession and reduces the self-esteem of practicing midwives, making it harder to recruit, motivate, and retain midwives – thus exacerbating the human resources crisis that the expansion of midwifery education is supposed to address. Hence, our finding begs for action by key players.

It is essential that the Ministry of Health, in collaboration with the Ethiopian Midwifery Association and other partners, take action to strengthen the skills of midwives entering the workforce. An integrative literature review suggests that targeted, repetitive in-service training using effective techniques and conducted in a setting similar to the workplace can improve knowledge and skills and clinical practice behaviors [35]. There is also evidence that supportive supervision coupled with audit and feedback improves health worker competence [7]. If feasible, requiring post-graduation preceptorship can be considered.

Higher education institutions in Ethiopia must strengthen their internal quality assurance systems to ensure the sufficiency and quality of teachers, physical resources, the teaching-learning process, and attainment of essential competencies. Assessment deserves special attention in view of the critical role it plays in driving student learning [36] and ensuring training quality [37]. Students’ low level of competence at graduation indicates the assessment methods in current use do not fully encourage students to master essential competencies and/or help make accurate promotion and graduation decisions. Based on the literature on validity and reliability of assessment [38, 39] as well our own experience, we hypothesize that the sources of the problems in Ethiopia may be lack of attention to formative assessment, under-representation of essential midwifery competencies in the assessment, subjective and less reliable assessment scores, weak performance assessment, and lowering of the pass/fail threshold.

Changing government regulations to subject public higher education institutions to accreditation would ensure their programs are consistent with professional standards [40], encourage institutional improvement and promote appropriate learning environments [41], and improve the quality and relevance of health professionals [42]. Currently, only private higher education institutions in Ethiopia are subject to accreditation [43]. This creates the risk that midwifery education programs at public institutions may not fulfill minimum resource requirements, particularly in the midst of a government push for rapid expansion.

The findings also provide important lessons for the global human resources for health community. Calls for strengthening human resources for health may have succeeded in increasing the quantity of health workers, but guaranteeing the quality of those graduates is harder to achieve. In fact, the intense focus globally on the shortage of health workers may actually have pushed the quality of education lower on governments’ health workforce agenda. World Health Organization guidelines clearly recognize that increasing the number of health workers without ensuring their competence will not strengthen health systems or improve health outcomes [42]. As our study shows, there is a need to refocus attention on the quality of health workers’ education. Countries working to rapidly increase the production of health workers should develop reliable quality assurance systems. Good practices in the successful scale-up of pre-service education that enhance the quality as well as the quantity of health workers should be documented and shared.
Strengths and limitations
This study is the first national-level assessment of the competence of midwifery students in Ethiopia and one of very few worldwide. It is also notable for the high quality of data on student competence. The assessment tasks are blueprinted from the ICM essential competencies and national priorities for midwifery, increasing the validity of the findings. The OSCE approach provided a reliable measurement of student competence. In addition, the observers were qualified and experienced, and the data collection process was rigorously supervised.

One limitation of the study is that it did not include TVET colleges from two underdeveloped regions (Afar and Somali), due to communication and travel challenges. It is possible that the findings on student competence are slightly higher because of this omission. However, we believe the findings do represent the big picture in Ethiopia, because the study included more than four-fifths of all midwifery training institutions in the country. Another limitation is that performance in a simulated setting may not be the same as performance in a real clinical setting.

Conclusions
The competence of graduating midwifery students, and hence the quality of pre-service education, was found to be inadequate. Male gender, sufficient clinical experience, and attending more births during training predicted competence, while other variables related to educational inputs and processes, students’ age, and type of educational program were not significant. The inadequate competence level has important implications for the Ministry of Health, training institutions, and regulatory bodies. Effective in-service training, on-the-job mentoring, and supervision are needed immediately to improve the competence of midwifery graduates who are entering the workforce. Without it, the safety of mothers and children will be placed at risk. For the long term, the quality of midwifery education programs at public institutions must be improved through strengthened internal quality assurance systems, external quality checks and accreditation systems.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
TY conceived the study and led the design of the study, data analysis, and drafting and revising of the manuscript. FA participated in the study design, coordination of data collection, and drafting of the manuscript, and carried out the data analysis. YK participated in the study design, data analysis, and drafting of the manuscript. MG participated in the study design, coordination of data collection, and drafting of the manuscript. DG participated in the design of the study and drafting of the manuscript. HG and AT participated in the drafting of the manuscript. JB and JS reviewed the manuscript critically and provided substantial suggestions for revision. All authors read and approved the content of the manuscript.

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CHAPTER 3

Using task analysis to generate evidence for strengthening midwifery education, practice, and regulation in Ethiopia

Using task analysis to generate evidence for strengthening midwifery education, practice, and regulation in Ethiopia

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Purpose: Realizing aspirations for meeting the global reproductive, maternal, newborn, and child health goals depends not only on increasing the numbers but also on improving the capability of midwifery workforce. We conducted a task analysis study to identify the needs for strengthening the midwifery workforce in Ethiopia.

Methods: We conducted a cross-sectional study of recently qualified midwives in Ethiopia. Purposively selected participants from representative geographic and practice settings completed a self-administered questionnaire, making judgments about the frequency of performance, criticality, competence, and location of training for a list of validated midwifery tasks. Using Statistical Package for the Social Sciences, Version 20, we computed the percentages and averages to describe participant and practice characteristics. We identified priority preservice education gaps by considering the tasks least frequently learned in preservice, most frequently mentioned for not being trained, and had the highest not capable response. Identification of top priorities for in-service training considered tasks with highest “not capable” and “never” done responses. We determined the licensing exam blueprint by weighing the composite mean scores for frequency and criticality variables and expert rating across practice categories.

Results: One hundred and thirty-eight midwives participated in the study. The majority of respondents recognized the importance of midwifery tasks (89%), felt they were capable (91.8%), reported doing them frequently (63.9%), and learned them during preservice education (56.3%). We identified competence gaps in tasks related to obstetric complications, gynecology, public health, professional duties, and prevention of mother to child transmission of HIV. Moreover, our study helped to determine composition of the licensing exam for university graduates.

Conclusion: The task analysis indicates that midwives provide critical reproductive, maternal, newborn, and child health care services and supports continuing investment in this cadre. However, there were substantial competence gaps that limit their ability to accelerate progress toward health development goals. Moreover, basing the licensure exam on task analysis helped to ground it in national practice priorities.

Keywords: midwife, perceived importance of tasks, frequency of performance, competence, in-service training needs, licensing exam blueprint

Introduction

Calls for transforming and scaling up the health workforce as a prerequisite for strengthening health systems and accelerating progress toward universal health coverage have never been stronger.\textsuperscript{1-4} It has also become clear that realizing aspirations for universal health coverage depends not only on increasing workforce numbers but also on improving its capability. Health system challenges in the 21st century require...
comprehensive health workforce strategies that transform performance and quality along with availability, accessibility, and acceptability.2

In the context of attaining national and international development goals for maternal and child health, this means transforming the midwifery workforce. With mounting evidence indicating reproductive, maternal, newborn, and child health (RMNCH) services by competent midwives can avert most maternal deaths, stillbirths, and newborn deaths, the preferred policy option is to invest in the midwifery workforce.3–8 Accordingly, many high-mortality, low- and middle-income countries have scaled up education and deployment of midwives.8,9 In Ethiopia, the number of midwives dramatically increased from 1,379 in 2008 to 9,244 in 2014.10 This is due to rapid expansion of midwifery education resulting in annual graduation outputs rising above 2,000. There are three types of undergraduate midwifery education programs in Ethiopia: direct entry university program leading to degree, direct entry vocational program leading to diploma, and postbasic nurse-midwife vocational program leading to diploma qualification.11

However, there is limited published data on the actual work of recently deployed midwives. Without such research evidence, it is difficult to know the effectiveness of current strategies and to improve the capability of midwives. Task, job, or practice analysis is a systematic assessment of knowledge and skills that characterize a professional practice.12 As such, a task analysis study can generate evidence on current performance of midwives and thereby serve as a data-driven method to identify the needs for strengthening the midwife workforce. We conducted this study to analyze actual on-the-job performance of midwives, identify the needs for strengthening midwifery education and training, and guide licensing exam blueprint development.

Materials and methods
Design
We conducted a cross-sectional study from December 9 to 13, 2013 to analyze the tasks performed by practicing midwives in Ethiopia.

Setting
Midwives from the four most populous and agrarian regions (Tigray, Amhara, Oromia, and Southern Nations, Nationalities, and Peoples), two of the three urban regions (Addis Ababa, Harari), and one of the four relatively less-developed regions (Somali) participated in the study, covering seven out of the eleven regional states and city administrations, home to 96% of Ethiopia’s population.

Participants
Recently qualified midwives with 6 months to 4 years of work experience participated in the study. The rationale for limiting the experience to 4 years was to obtain data that reflect midwives’ preservice education (PSE) and recent in-service training, rather than expertise gathered over long years of practice. Midwives having <6 months experience were also excluded, as they were not expected to have enough practice and training opportunities to make meaningful judgments. Each respective regional health bureau sent invitation letters to geographically representative health centers and hospitals in their jurisdiction to identify eligible midwives for recruitment. Each facility, in turn, purposively selected one appropriate midwife to participate in the study.

Variables
We drafted a midwifery task list from national scopes of practice, curricula, and job descriptions and validated it in a national expert panel workshop. The expert panel included midwifery educators and practitioners from different institutions, as well as representatives from the Federal Ministry of Health and the Ethiopian Midwifery Association. The final task list had 86 midwifery tasks including professional duties, general service delivery tasks, reproductive and maternity care tasks, labor and delivery tasks, and community/public health tasks. Three tasks were excluded later, as they were thought to be outside of midwifery scope of practice. Study participants made four judgments about each task. The first question was about frequency (how often did a participant perform a task?). The possible responses were daily (completed a task at least once per day), weekly (completed a task less often than daily, but at least once per week), monthly (completed a task less often than weekly, but at least once per month), rarely (completed a task less often than monthly), and never (lacked the opportunity or capability to perform a task). The second question concerned criticality (how critical is timely and effective performance of a task for client and/or population health outcomes?). The response options were high (failure to complete a task correctly or in a timely manner will lead to client death, permanent disability, or major impact on public health), moderate (failure to complete a task correctly or in a timely manner may lead to serious client discomfort, short-term disability, or moderate impact on public health), and low (failure to complete a task correctly or in a timely manner...
will lead to minimal impact on client or public health). The third question was about performance (how competent is the participant in performing a task?). The possible responses were proficient (expert at a task or can perform a task so well that s/he feels comfortable supervising others), competent (capable of performing a task safely, although may ask for supervision from a more experienced provider), and not capable (not comfortable performing a task; may cause harm if a task is performed without supervision). The fourth question concerned location or timing of training (when and where did the participant learn to perform a task?). The response options were PSE (received formal training as part of the PSE), in-service training (received formal training at some point after graduation), on-the-job training (received informal training from coworkers or supervisor, once began working), and not trained (received no formal or informal training for a task). We also collected data on sociodemographic variables including age, sex, region, qualification (diploma or bachelor degree), type of facility (health center or hospital), and length of work experience.

Measurement

We used a structured self-administered questionnaire with a validated task list to collect data. In each region, the study participants gathered at one place for a data collection workshop and completed the questionnaires individually with facilitation support from an expert midwife. Data collectors verified eligibility of study participants before the start of data collection workshops.

Data analysis

We used Statistical Package for the Social Sciences, Version 20 (IBM Corporation, Armonk, NY, USA) for data analysis. Descriptive statistics included frequencies and means for the four key variables and sociodemographic characteristics. Further analysis examined response combinations to identify priority areas for PSE strengthening, in-service training, and licensing exam development. We identified priority PSE gaps by selecting critical tasks with a combination of relatively low “trained in PSE”, high “not trained”, and high “not capable” responses. Top needs for in-service training prioritized critical tasks with high percentage of responses for “not capable” and “never done”.

We considered responses to “criticality” and “frequency” variables to determine the level of emphasis in midwifery licensing exam. Grouped task lists in seven categories represented broad midwifery practice areas, namely, family planning, antenatal care, labor and delivery, postpartum care, gynecology care, care for the newborn and under-five child, and community/public health. We then applied the following steps to determine the percentage distribution of exam among the seven categories. First, we calculated the mean frequency and criticality score for each task, ranging from 1 (denoting never) to 5 (denoting daily) and from 1 (denoting low criticality) to 3 (denoting high criticality), respectively. We then calculated the composite mean score for each task (range was 2–8). We reviewed tasks with borderline composite mean scores (3 < “X” < 5) for possible elimination and calculated the average of composite mean scores for each category. Finally, we summed the category averages and computed the proportion of each category out of the total.

We complemented results from the task analysis study with subjective ratings from 32 experts during licensing exam writing workshop in February 2015. Item writers assigned percentage weight to each of the seven categories. We computed the mean of the expert assessments for each category and averaged it with the results from the survey.

Data quality assurance

The task list was developed based on national documents and validated in an expert panel workshop. A 5-day data collection training was conducted prior to field work. Training topics included introduction to task analysis methodology, study protocol, data storage, and ethical issues. Participants practiced data collection techniques in a role-play format after discussing the task list. Proficient midwives recruited from each region facilitated the data collection workshop and experts from the Federal Ministry of Health, Ethiopian Midwifery Association, and Jhpiego supervised the data collection process.

Ethical clearance

We obtained ethical clearance for the study from the Johns Hopkins University Institutional Review Board Office and approval from the Ethiopian Ministry of Health and respective regional health bureaus. Informed verbal consent was also obtained from the study participants prior to data collection.

Results

Sociodemographic characteristics

One hundred and thirty-eight midwives selected from six regional states and one city administration participated in the study, giving a response rate of 98.6% (138/140). With regard to sociodemographic characteristics, majority of the respondents were females (80.4%), younger than 25 years
(62.3%), had a diploma/vocational qualification (81.9%), worked in health centers (60.9%), and had 2 years or less of work experience as a midwife (58%). The mean duration of service was 2.6 years (Table 1).

Analysis of tasks performed by recently qualified midwives
Table 2 summarizes the responses of study participants to frequency, criticality, competence, and timing/location of training questions by competency domain. Approximately 90% of respondents recognized the importance of midwifery tasks and felt they were capable of performing them. More than half of them also reported performing midwifery tasks frequently and having learned them during PSE. Furthermore, the majority of study participants said they provided family planning (58.7%), antenatal care (73.2%), normal delivery (82.6%), postpartum care (76.8%), and essential newborn care (79.7%) services on a daily basis (data not shown).

Although all tasks were deemed critical by the vast majority (85.2%–92.7%) of study participants, more than 10% of respondents rated all but antenatal care, normal labor and delivery, and child health care tasks as of low importance. Likewise, although an overwhelming majority (81.3%–97.3%) said they were capable of performing midwifery tasks, a sizable proportion (11.2%–18.7%) reported competence gaps in gynecology, obstetric complications, and community/public health tasks. These three task categories were also the least frequently performed tasks. Although PSE was the predominant time of learning, a substantial percentage (28.8%–50.0%) of respondents learned midwifery tasks by in-service training and informal on-the-job learning. The in-service/on-the-job modalities played a particularly prominent role in learning HIV/prevention of mother to child transmission of HIV (PMTCT) competencies and professional duties. Gynecology, public health, and obstetric complications had notable response rates (9.5%–12.0%) for never being trained.

Gaps in education and needs for training
Table 3 summarizes the top 20 gaps in preservice midwifery education. Twenty critical tasks had relatively low “trained in PSE”, high “not trained”, and high “not capable” responses. The least frequently learned tasks in PSE were membership in professional association, participating in policy dialog, training and supervising community health workers (CHWs), and performing manual vacuum aspiration (MVA). The most frequently mentioned tasks for “not trained” were detecting reproductive organ cancers and tumors, performing MVA, membership in professional association, identifying injuries of pelvic muscles, surveillance of maternal and newborn health conditions, training and supervising CHWs, and preparing and assisting with operations. The biggest competence gaps (hence top in-service training needs) were in detecting reproductive organ cancers and tumors, assisting with operations, identifying pelvic muscle injuries, membership in professional association, diagnosis and management of ectopic pregnancy, diagnosis and management of abortion, induction and augmentation, and identifying, counseling, and preventing infertility.

Exam blueprint for midwifery licensing exam
The results from the task analysis study suggested the midwifery licensing exam composition to include 14.9% family planning, 15.1% antenatal care, 14.7% labor and delivery, 15.3% postpartum care, 13.2% gynecology, 14.5% newborn and child health, and 12.4% public health questions. Expert ratings during item writing workshop for licensing exam generated higher emphasis for antenatal (+3.4 points) and labor and delivery (+10.2 points) categories, but lesser emphasis for family planning (−2.7 points) postpartum (−2.4 points), gynecology (−1.6 points), under-five (−3.5 points), and public health (−3.8 points) categories. Averaged percentages from the task analysis study and the

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**Table 1**: Sociodemographic characteristics of the study participants (N=138)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>27 (19.6)</td>
</tr>
<tr>
<td>Female</td>
<td>111 (80.4)</td>
</tr>
<tr>
<td>Age, years</td>
<td></td>
</tr>
<tr>
<td>19–24</td>
<td>86 (62.3)</td>
</tr>
<tr>
<td>25–45</td>
<td>52 (37.7)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
</tr>
<tr>
<td>Tigray</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Amhara</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Oromia</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Somali</td>
<td>22 (15.9)</td>
</tr>
<tr>
<td>SNNP</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Harari</td>
<td>16 (11.6)</td>
</tr>
<tr>
<td>Addis Ababa</td>
<td>20 (14.5)</td>
</tr>
<tr>
<td>Facility type</td>
<td></td>
</tr>
<tr>
<td>Health center</td>
<td>84 (60.9)</td>
</tr>
<tr>
<td>Hospital</td>
<td>54 (39.1)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>113 (81.9)</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>25 (18.1)</td>
</tr>
<tr>
<td>Year of service</td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>7 (5.1)</td>
</tr>
<tr>
<td>1–2</td>
<td>73 (52.9)</td>
</tr>
<tr>
<td>3–4</td>
<td>58 (42)</td>
</tr>
</tbody>
</table>

Abbreviation: SNNP, Southern Nations, Nationalities, and Peoples.
expert ratings resulted in a final exam distribution plan composed of labor and delivery, antenatal care, postpartum care, family planning, care for the newborn and under-five child, gynecology, and public health questions, in decreasing frequency (Figure 1).

Discussion

Our study examined midwifery practice and generated evidence to strengthen midwifery education, care, and regulation. Strengths of the study include use of a nationally representative sample from geographic and practice settings for midwives working in the public sector. A limitation to task analysis surveys is that the data is self-reported and there is potential for responses to be ones that the respondents considered most acceptable. We tried to mitigate this with assurance to the study participants that their responses would not be linked to their names and that reporting would be aggregate. Another limitation was that some of the

<table>
<thead>
<tr>
<th>Task domains (# of tasks)</th>
<th>Frequency (%)</th>
<th>Criticality (%)</th>
<th>Competence (%)</th>
<th>Location (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>I</td>
</tr>
<tr>
<td>Professional duties (16)</td>
<td>66.7</td>
<td>8.4</td>
<td>24.8</td>
<td>85.2</td>
</tr>
<tr>
<td>General service (11)</td>
<td>79.1</td>
<td>8.0</td>
<td>12.8</td>
<td>88.4</td>
</tr>
<tr>
<td>Family planning (3)</td>
<td>74.6</td>
<td>4.8</td>
<td>20.5</td>
<td>87.9</td>
</tr>
<tr>
<td>Antenatal care (5)</td>
<td>75.1</td>
<td>7.1</td>
<td>17.8</td>
<td>92.6</td>
</tr>
<tr>
<td>HIV/PMTCT (3)</td>
<td>81.2</td>
<td>5.1</td>
<td>13.8</td>
<td>89.6</td>
</tr>
<tr>
<td>Labor and delivery (3)</td>
<td>77.0</td>
<td>6.5</td>
<td>16.4</td>
<td>90.8</td>
</tr>
<tr>
<td>Postnatal care (4)</td>
<td>67.8</td>
<td>7.9</td>
<td>24.2</td>
<td>89.5</td>
</tr>
<tr>
<td>Obstetric complications (10)</td>
<td>49.3</td>
<td>10.8</td>
<td>39.8</td>
<td>88.1</td>
</tr>
<tr>
<td>Gynecology care (8)</td>
<td>41.4</td>
<td>9.1</td>
<td>49.6</td>
<td>87.4</td>
</tr>
<tr>
<td>Under-five child (2)</td>
<td>57.0</td>
<td>13.1</td>
<td>30.1</td>
<td>92.7</td>
</tr>
<tr>
<td>Public health (18)</td>
<td>36.2</td>
<td>15.4</td>
<td>48.3</td>
<td>87.2</td>
</tr>
<tr>
<td>Total (83)</td>
<td>63.9</td>
<td>8.9</td>
<td>27.2</td>
<td>89</td>
</tr>
</tbody>
</table>

Notes: “H” denotes high frequency and includes daily and weekly responses; “M” denotes moderate frequency and means monthly response; and “L” denotes low frequency and includes rarely and never responses. Within criticality, “I” denotes important and includes high and moderate responses and “L” denotes low importance. Within competence, “C” denotes competent and includes proficient and competent responses and “NC” denotes not capable. In location of training, PSE refers to preservice education, IST refers to in-service training and includes in-service training and informal on-the-job learning, and NT means not trained.

Abbreviation: HIV/PMTCT, human immunodeficiency virus/prevention of mother to child transmission of HIV.

Table 3 Top 20 gaps in preservice midwifery education

<table>
<thead>
<tr>
<th>Tasks</th>
<th>% Critical</th>
<th>% Trained in PSE</th>
<th>% Not trained</th>
<th>% Not capable</th>
<th>% Never done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership in professional organization</td>
<td>78.2</td>
<td>23.9</td>
<td>29.0</td>
<td>23.9</td>
<td>51.4</td>
</tr>
<tr>
<td>Participate in policy dialog to advance MNCH</td>
<td>88.4</td>
<td>25.4</td>
<td>14.5</td>
<td>13.0</td>
<td>23.2</td>
</tr>
<tr>
<td>Train and supervise CHWs</td>
<td>86.2</td>
<td>30.4</td>
<td>18.8</td>
<td>14.5</td>
<td>37.7</td>
</tr>
<tr>
<td>Perform manual vacuum aspiration</td>
<td>82.7</td>
<td>31.2</td>
<td>29.0</td>
<td>37.7</td>
<td>47.1</td>
</tr>
<tr>
<td>Coordinate educational outreach programs</td>
<td>81.2</td>
<td>34.1</td>
<td>13.8</td>
<td>18.8</td>
<td>30.4</td>
</tr>
<tr>
<td>Provide ARV for PMTCT</td>
<td>88.4</td>
<td>34.8</td>
<td>12.3</td>
<td>16.7</td>
<td>16.7</td>
</tr>
<tr>
<td>Collaborate with community groups</td>
<td>84.7</td>
<td>35.5</td>
<td>9.4</td>
<td>12.3</td>
<td>14.5</td>
</tr>
<tr>
<td>Conduct research activities</td>
<td>70.3</td>
<td>37.0</td>
<td>15.9</td>
<td>17.4</td>
<td>32.6</td>
</tr>
<tr>
<td>Function as a member of health team</td>
<td>81.2</td>
<td>37.0</td>
<td>14.5</td>
<td>12.3</td>
<td>25.4</td>
</tr>
<tr>
<td>Prepare and assist with operations</td>
<td>68.1</td>
<td>42.8</td>
<td>18.1</td>
<td>26.1</td>
<td>34.8</td>
</tr>
<tr>
<td>Surveillance of MNCH conditions</td>
<td>86.3</td>
<td>45.7</td>
<td>20.3</td>
<td>12.3</td>
<td>30.4</td>
</tr>
<tr>
<td>Detect cancer of reproductive organs</td>
<td>82.6</td>
<td>46.4</td>
<td>29.0</td>
<td>42.8</td>
<td>55.8</td>
</tr>
<tr>
<td>Identify injuries of pelvic muscles</td>
<td>83.3</td>
<td>47.8</td>
<td>20.3</td>
<td>25.4</td>
<td>21.7</td>
</tr>
<tr>
<td>Management of women who have experienced sexual assault</td>
<td>89.9</td>
<td>48.6</td>
<td>11.6</td>
<td>18.1</td>
<td>21.0</td>
</tr>
</tbody>
</table>

Diagnose and manage abortion | 84.1       | 49.3             | 17.4          | 21.7          | 23.2         |
Detect reproductive organ tumors | 79.8       | 51.4             | 19.6          | 31.2          | 34.1         |
Operative vaginal deliveries | 89.1       | 56.5             | 9.4           | 13.8          | 19.6         |
Diagnose and manage ectopic pregnancy | 85.5       | 63.8             | 13.0          | 23.2          | 31.9         |
Identify, counsel, and prevent infertility | 88.4       | 63.8             | 8.7           | 20.3          | 23.9         |
Perform induction and augmentation | 78.3       | 63.8             | 5.8           | 21.0          | 29.0         |

Abbreviations: CHWs, community health workers; MNCH, maternal, newborn, and child health; PSE, preservice education; ARV PMTCT, anti-retroviral drug for prevention of mother to child transmission of HIV.
tasks were not discrete enough, making interpretation less straightforward.

The proportion of male midwives in our study might appear high compared to other countries, but it reflects the Ethiopia midwifery workforce and is consistent with a previous study conducted with graduating midwifery students.11

Our results confirmed that midwives are crucial providers of reproductive, maternal, newborn, and child health care services. This supports the Ethiopian government’s policy strategy to scale up midwifery education. Most midwives not only understood the significance of their tasks to health and well-being of women and children but also reported that they performed them competently and routinely. Study participants participated in gynecology, public health, and obstetric complications management less often, probably due to a combination of lack of opportunity and capability (Table 2). Task analysis studies from sub-Saharan African countries have also reported largely similar findings. A Liberian study reported that most (60%–80%) midwives completed their tasks frequently, except for obstetric complications and child health interventions.13 A Malawi study found that majority of nurse-midwife technicians were competent in midwifery and infectious diseases and performed them frequently, but were not competent at the less common tasks related to cancer, public health, and obstetric complications.14 Majority of maternal and child health nurses (57.9%–75.1%) in Mozambique frequently provided antenatal, labor and delivery, newborn and postpartum care, but rarely participated in complications management, gynecology, and public health.15

Our study revealed the presence of significant gaps in the content and quality of preservice midwifery education in the areas of obstetric complications, gynecology, public health, professional duties, and prevention of mother-to-child transmission of HIV. A large proportion of respondents did not learn several tasks that are within expected midwifery practice in PSE. A number of tasks learned in PSE also had low levels of reported competence (Table 3). Even though small, the percentage of participants who thought midwifery tasks were of low importance was not negligible. This is potentially a concern, as midwives may not want to learn and do tasks that they think are less important. Lack of appreciation of task importance might be due to lack of knowledge, which possibly indicates a need for greater emphasis in PSE (Table 2).

The weakness we found in preservice midwifery education is consistent with findings from other studies in Ethiopia, Africa, and Asia. Assessment of graduating midwifery students in Ethiopia showed low achievement of competencies, particularly in performance of MVA, vacuum-assisted delivery, partograph use, and integrated management of childhood illnesses.11 A mixed methods study identified insufficient PSE as a key barrier to provision of quality emergency obstetric care in Addis Ababa, Ethiopia.16 A task analysis of nurse-midwife technicians in Malawi reported low levels of competence in obstetric complications management.14 A similar study in Liberia found that 13%–20% of midwives did not receive PSE on some antenatal, normal delivery, and postnatal care tasks.13 A study in Mali reported that midwives scored 66.4% on assessment of emergency obstetric care knowledge and skills using clinical vignettes.17 Evaluation of midwifery graduates’ performance in Afghanistan found gaps in retention of clinical competencies with more pronounced deficits in shock management and MVA.18 An Indian study indicated that final year midwifery students had low level of confidence in basic midwifery competencies for antepartum, intrapartum, postpartum, and newborn care.19
The possible gaps in PSE and competence of midwives have important implications. The substantial gaps in management of obstetric complications are particularly critical in view of their importance for maternal and newborn survival and the global commitment to end preventable maternal and child deaths. Reproductive organ cancers are also a leading cause of morbidity and mortality for women in low- and middle-income countries. Breast, cervical, and ovarian cancers are the most common cancers among Ethiopian women and account for half of cancer-related deaths. The capacity gap for detecting reproductive organ cancers is significant as it constrains the ability to increase access to screening and treatment services in Ethiopia. Infertility is also a major, but neglected public health problem in low-income countries including Ethiopia. Prevention and treatment services are limited, partly due to lack of trained staff. As key reproductive health care providers, midwives should be able to provide basic infertility prevention, diagnostic, and treatment services. Violence against women is also a pervasive public health problem with impacts on sexual, reproductive, and perinatal health outcomes. As women’s health care providers, midwives have an important role to play in identifying victims of violence and providing clinical care.

Midwives can contribute even more to strengthen health systems and improve RMNCH outcomes if they actively participate in public health, research, and policy activities beyond clinical care. Addressing the gaps in preservice content for these areas is important to increase midwifery participation. Health promotion and disease prevention are central to midwifery practice and midwives need public health knowledge and skills to carry out this function effectively. Improving the health of women and children requires understanding the social determinants of health and partnership, which in turn require public health and policy advocacy skills. The education gap in preparing midwives to train and supervise CHWs represents a missed opportunity because health extension workers (who are the CHWs in Ethiopia) are the frontline RMNCH care providers for the rural Ethiopian population. Midwives are expected to support and collaborate with them in promoting and providing family health services such as family planning, antenatal care, assisted delivery, vaccination, and treatment of common childhood illnesses.

The International Confederation of Midwives regards organization of midwives in an association as one of the three pillars for a strong midwifery profession and an important force to improve the health of women and children. However, our study clearly indicated that PSE seldom addressed membership in professional association and, possibly consequently, the majority of respondents were not members of a professional association. A significant percentage did not believe membership was important. The perception gap may be an indication that midwives did not believe they would benefit from membership in a professional association, which suggests that the local midwifery association needs to do more to educate and attract midwives. Membership in a professional association may strengthen professional identity and increase motivation and performance.

Ethiopia is one of the 22 countries with the highest number of pregnant women living with HIV. In view of the increased efforts required to achieve the global goal of eliminating new child infections, the inadequacy in PMTCT education and competence is significant. In-service training appears to have played a bigger role than PSE and compensated for much of the education gap in PMTCT. This, however, warrants further work to integrate the in-service content in preservice curriculum and improve competence in this area.

Midwives can have a great impact in improving RMNCH outcomes. Competent midwives can provide most of the essential care needed to prevent most maternal and newborn deaths. However, realizing the full benefits of midwifery care for the health and well-being of women and children requires reviewing and strengthening midwifery education with focus on priority gaps identified in our study.

Even more urgent is the need to enhance the capacity of the existing midwifery workforce. A substantial proportion of currently practicing midwives need opportunities for improving their competence in obstetric complications, reproductive organ cancers, and infertility. Because these are low-frequency events, opportunities for informal on-the-job learning and practice are limited. An alternative is requiring an in-service training intervention. Several studies from low-resource settings have demonstrated that it is feasible to train midlevel health workers to provide safe and effective emergency obstetric care and cervical cancer screening. Basic infertility prevention and management services can be offered in low-resource settings.

Professional association meetings offer an important avenue to access continuing education. A challenge is the
low membership rates reported by respondents. If local professional associations can inform and motivate potential members, it would be an important way to provide continuing education.

Conducting task analysis study is foundational for developing a valid and legally defensible licensing examination, as the content of a licensing examination should be closely related to the tasks that a health professional performs on the job. The American Midwifery Certification Board and the National Council of State Boards of Nursing periodically conduct task analysis studies to guide development of exam content. Our findings suggested a licensing exam should systematically sample all areas of midwifery practice, including reproductive, maternal, and child health services to individuals and populations, but with greater emphasis on antepartum, intrapartum, and postpartum care. This is consistent with test specification weights recommended in the latest task analysis by the American Midwifery Certification Board, which suggested a broad sampling of midwifery practice and greater emphasis on antepartum (22%), intrapartum (22%), and postpartum (16%) care.12 Our findings served as the basis for development of a blueprint for the first national licensing exam for bachelor of science in midwifery, which was successfully administered in 2015. The exam provides a standard that new graduates must meet to enter the workforce. In addition, a licensing exam developed in this manner can improve the quality and relevance of midwifery education through feedback to midwifery schools.

Conclusion

Midwives are important providers of RMNCH services, and the Government of Ethiopia should continue to invest in midwifery as a key strategy to achieve national health development goals. However, there are substantial PSE gaps that need addressing through strengthening the content and quality of midwifery education with focus on obstetric complications, gynecology, public health, professional duties, and PMTCT in light of national and global priorities. Our study also revealed the presence of significant gaps in ability of the existing midwifery workforce to identify and/or manage obstetric complications, reproductive organ cancers, and infertility. Strengthening the existing midwifery workforce through targeted in-service training is urgently needed in order to realize the full potential of midwifery care to provide services to Ethiopian families. The majority of midwives were not a member of a professional association, indicating the need for greater effort by the national midwifery association to attract and recruit midwives. The Strengthening Human Resources for Health Project should support the Ministry of Health to revise midwifery curricula and develop need-based in-service training courses. The Ethiopian Midwifery Association could collaborate in these efforts and play a role in providing continuing education and in-service courses.

Our study also served as the primary basis for developing the first national licensing exam for graduates of bachelor of science in midwifery. This contributes to assuring the quality and relevance of midwifery education and the midwifery workforce. We recommend that task analysis be conducted periodically to inform continuous improvement of midwifery education and practice. Future studies should involve larger sample populations, apply probabilistic sampling procedure, and develop a more specific task list.

Acknowledgments

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Disclosure

The authors report no conflicts of interest in this work.

References


CHAPTER 4

Quality of midwife-provided provided intrapartum care in Amhara Regional State, Ethiopia

RESEARCH ARTICLE

Quality of Midwife-provided Intrapartum Care in Amhara Regional State, Ethiopia

Tegbar Yigzaw, Fantu Abebe, Lalem Belay, Yewulsew Assaye, Equlinet Misganaw, Ashebir Kidane, Desalegn Ademie, Jos van Roosmalen, Jelle Stekelenburg, and Young-Mi Kim

Abstract

Background: Despite much progress recently, Ethiopia remains one of the largest contributors to the global burden of maternal and newborn deaths and stillbirths. Ethiopia’s plan to meet the sustainable development goals for maternal and child health includes unprecedented emphasis on improving quality of care. The purpose of this study was to assess the quality of midwifery care during labor, delivery and immediate postpartum period.

Methods: A cross-sectional study using multiple data collection methods and a 2-stage cluster sampling technique was conducted from January 25 to February 14, 2015 in government health facilities of the Amhara National Regional State of Ethiopia. Direct observation of performance was used to determine competence of midwives in providing care during labor, delivery, and the first 6 h after childbirth. Inventory of drugs, medical equipment, supplies, and infrastructure was conducted to identify availability of resources in health facilities. Structured interview was done to assess availability of resources and performance improvement opportunities. Data analysis involved calculating percentages, means and chi-square tests.

Results: A total of 150 midwives and 56 health facilities were included in the study. The performance assessment showed 16.5% of midwives were incompetent, 72.4% were competent, and 11.1% were outstanding in providing routine intrapartum care. Forty five midwives were observed while managing 54 obstetric and newborn complications and 41 (91%) of them were rated competent. Inventory of resources found that the proportion of facilities with more than 75% of the items in each category was 32.6% for drugs, 73.1% for equipment, 65.4% for supplies, 47.9% for infection prevention materials, and 43.6% for records and forms. Opportunities for performance improvement were inadequate, with 31.3% reporting emergency obstetric and newborn care training, and 44.7% quarterly or more frequent supportive supervision. Health centers fared worse in provider competence, physical resources, and quality improvement practices except for supportive supervision visits and in-service training.

Conclusions: Although our findings indicate most midwives are competent in giving routine and emergency intrapartum care, the major gaps in the enabling environment and the significant proportion of midwives with unsatisfactory performance suggest that the conditions for providing quality intrapartum care are not optimal.

Keywords: Labor, childbirth and immediate postpartum care, Competence, Enabling environment, Physical resources, Performance and quality improvement

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Background
Despite failing to reach the millennium development goals (MDGs), much progress has been made in improving the health of mothers and children globally [1]. Maternal mortality ratio (MMR) fell by 44% and under-five mortality rate declined by 53% between 1990 and 2015. Ethiopia registered a more remarkable progress, reducing MMR by 71.8% and meeting the MDG target for reducing under-five mortality by two-thirds [2, 3]. However, the levels of maternal mortality ratio (353 per 100, 000 live births), neonatal mortality rate (28 per 1000 live births) and stillbirth rate (29.7 per 1000 births) remain high, making Ethiopia one of the largest contributors to the global burden of maternal deaths, newborn deaths, and stillbirths, ranking fourth, sixth, and fifth, respectively [4, 5].

In 2015, the United Nations General Assembly adopted the more ambitious sustainable development goals (SDGs), which include targets for ending preventable neonatal deaths and drastically reducing global MMR to less than 70 per 100,000 live births [1]. In line with this global aspiration, the Government of Ethiopia committed to markedly reduce MMR to 199 per 100,000 live births and neonatal mortality (NMR) rate to 10 per 1000 live births by 2020 [6].

Meeting these ambitious global and national goals for maternal and newborn health requires improving the quality of maternal and newborn care. In view of the fact that intrapartum and postpartum periods are the time of greatest risk for the mother, fetus and newborn [7], assuring the quality of care provision during labor, childbirth and immediate postpartum period is of utmost importance. Encouraged by a positive trend in coverage of healthcare services during the MDG period, the Government of Ethiopia has also put unprecedented emphasis on improving quality of care in its current health sector plan [6]. In addition to improving health systems and health outcomes [8], improving quality of care can increase demand for maternal health care [9], which is still a challenge in Ethiopia [10].

Improving quality of care requires measuring it accurately and addressing identified gaps [11]. There is a clear need for more and better research evidence on quality of intrapartum care and quality of maternal health workforce especially from low and middle income countries [12–15]. Most previous studies on quality of care or workforce from Ethiopia and other resource-constrained settings are based on self-report, written test, or simulation with anatomical models [16–23]. In addition, most studies assessed emergency obstetric and newborn care [EmONC] capability but not quality of routine childbirth care [12, 18, 22, 24–28].

The literature on healthcare quality measurement and improvement describe multiple dimensions of healthcare quality. The Donabedian model and its derivatives focus on the structure-process-outcome dimensions as the basis for healthcare quality measurement and improvement, where structure encompasses the physical environment that is conducive to providing quality care, process refers to professional competence of providers and effective communication with clients, and outcome includes mortality, morbidity and patient satisfaction [11, 29–35]. On the other hand, a systematic review of performance measurement and improvement frameworks in health, education and social service sectors identified 16 quality concepts and categorized them under five domains: collaboration, learning and innovation, management perspective, service provision, and outcome [36].

For the purpose of our study, we assessed some elements of quality of intrapartum care described in both models [29, 36]; namely, aspects of structure, process and outcome in the Donabedian framework; and aspects of learning and innovation, management perspective, service provision, and outcome in the cross-sectoral performance improvement framework. Our study also sought to assess quality of care in workplace settings through direct observation. Specifically, we assessed competence of midwives in provision of routine and emergency care during labor, childbirth, and immediate postpartum period including maternal and newborn outcomes. Secondly, we evaluated availability of essential resources for provision of quality labor, delivery, and immediate postpartum care. Thirdly, we assessed availability of opportunities for continuous quality improvement of labor, delivery and immediate postpartum care.

Methods
Study design and setting
A cross-sectional study using multiple data collection methods was conducted from 25 January to 14 February 2015 to assess the quality of midwifery care during labor, childbirth and first 6 h of the postpartum period. The study was conducted in government health facilities of the Amhara National Regional State, the second most populous region in Ethiopia, with an estimated population of 20.4 million people [37].

Study participants
At the time of the study, the Amhara National Regional State had 19 hospitals and 801 health centers owned by the government; and there were 1400 midwives working in these facilities. The inclusion criteria for facilities was having at least two midwives and a caseload of one or more deliveries per day. Accordingly, 19 hospitals and 360 health centers met the inclusion criteria.

Sample size for the number of midwives to be included in the study was estimated to be 150. The sample size was determined (with the formula of \( n = \frac{(Z_1-\alpha)^2 \cdot SD^2}{d^2} \)) based on the following assumptions: 95%
level of confidence, 51.8% mean competence score of midwives with standard deviation (SD) of 15.3% [17], 5% margin of error (d), and design effect (Deff) of 1.2. Since N (number of midwives in facilities with one or more deliveries per day) was 834, a finite population adjustment (n/(1 + n/N)) was applied. Finally, a 10% allowance was considered for anticipated non-response resulting in a sample size of 150.

The study used a two-stage cluster sampling technique, where health facilities were sampled at first stage and midwives sampled at the second stage. Data from the regional health bureau showed, on average, six midwives and two midwives were available in hospitals and health centers, respectively. Assuming four midwives will be recruited from each hospital and two midwives from each health center, 56 health facilities were required to achieve the necessary sample size. Accordingly, all the 19 public hospitals were included in the study while we selected 37 out of the 360 eligible health centers by simple random sampling using computer generated random numbers. (Table 1)

Data collection
For the purposes of this study, data were collected on the three aspects of the structure-process-outcome model [29] as well as the four aspects of the cross-sectoral performance measurement and improvement framework [36]: competence (which corresponds to the “process” and the “service provision” aspects in the Donabedian and cross-sectoral performance measurement framework, respectively), availability of essential resources for intrapartum care (which falls under the “structure” and the “management perspective” aspects in the Donabedian and cross-sectoral frameworks, respectively), continuous quality improvement practices (which fall under the “learning and innovation” aspect in the cross-sectoral framework), and maternal and newborn outcomes (which are captured in both models).

Data were collected using direct observation of performance, inventory of resources and infrastructure, and structured interview with midwives. Each midwife was observed while providing labor, delivery, and postpartum care to a woman from admission through 6 h after childbirth. If the observation was incomplete, a midwife was observed on the next laboring mother. Performance was assessed for 13 aspects of intrapartum care; namely, rapid initial evaluation, history taking, physical examination, (the modified) partograph use, assisting a woman to have a safe and clean birth, immediate postpartum care, clinical judgment/decision-making, responding to problems, communication skills, infection prevention, organization, efficiency and teamwork, humanistic qualities/professionalism, and overall performance in providing labor, delivery and immediate postpartum care. Proficient midwives performed the rating using a 9-point Likert scale, where 1 to 3 denoted unsatisfactory or incompetent performance, 4 to 6 satisfactory or competent performance, and 7 to 9 outstanding or superior performance. Brief descriptors of typical performance of each aspect were written on the assessment tool to standardize rating. If complications arose during the process of care, assessors evaluated competence of midwives in managing the complications using appropriate checklists adapted from national guidelines (performance rating scales for routine care and checklists for complications management are provided as Additional files 1, 2, 3 and 4).

Data collectors also carried out facility inventory of drugs, medical equipment, supplies, and infrastructure essential to provide care during labor, delivery and postpartum period using an observation checklist. Thirdly, structured interview was conducted with midwives to capture perceived availability of resources and learning and performance improvement opportunities (Interview questionnaire and inventory checklist are annexed as Additional files 1 and 2). The interview took place at a convenient time and place for study participants.

Data were collected by 12 proficient midwives with supervisory support from four members of the research team. Data collectors and supervisors attended training before fieldwork including hands-on practice of observation and performance rating. Actual field pre-testing was also done in health facilities to check and improve reliability of the tools and assessors.

Before beginning data collection, the study team first met the person in charge of each health facility and explained the purpose of the study; presented a letter of approval from the regional health bureau; provided a copy of the study information sheet; and answered questions. Study team members then met all eligible participants at each facility and explained the study and sought written consent from providers and verbal consent from mothers.

Table 1 Sampling of government health facilities and midwives, Amhara Regional State, Ethiopia, 2015

<table>
<thead>
<tr>
<th>Strata</th>
<th># of hospitals and health centers</th>
<th># of facilities with at least one delivery per day</th>
<th>Estimated # of midwives working in eligible facilities</th>
<th>Allocation of midwives by facility type</th>
<th># of sample facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>19</td>
<td>19</td>
<td>114</td>
<td>76</td>
<td>19</td>
</tr>
<tr>
<td>Health center</td>
<td>801</td>
<td>360</td>
<td>720</td>
<td>74</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>820</td>
<td>379</td>
<td>834</td>
<td>150</td>
<td>56</td>
</tr>
</tbody>
</table>
Data analysis
Data were entered into EPI-Data and exported to STATA® IC 12 (STATA Corp. Texas, USA) for analysis. Competence of midwives in providing intrapartum care was determined by calculating average performance scores across the 13 dimensions. The percent of midwives who had unsatisfactory (incompetent), satisfactory (competent) and superior (outstanding) performance for each of the 13 dimensions was calculated. These were summarized by calculating mean percentages for the entire care. Proportion of respondents who managed complications competently was also calculated. Satisfactory and superior performance were interpreted as competent performance. Reliability analysis was performed to assess internal consistency of the items but we could not do inter-rater and intra-rater reliability as the performances were not rated by two independent raters nor twice by the same rater. Proportions were also used to summarize findings of facility inventory and interview on availability of resources and performance improvement opportunities. Percentages of facilities having less than 50%, 50 to 75%, and more than 75% of the resources in each category were computed. Chi-square test was done to identify significant differences between hospitals and health centers. Missing data were excluded from the analysis.

Results
Profile of study participants
A total of 150 midwives and 56 government health facilities (37 health centers and 19 hospitals) in which they worked were included in the study, yielding a 100% response rate. However, fewer midwives than planned (57 versus 74) were actually observed from health centers, as some health centers did not have the expected number of midwives or a laboring mother during the facility visit and these were compensated by observing more midwives from hospitals (93 versus 78). Majority of midwives in our study were males, under 25 years of age, with a diploma level training, and with less than 5 years of work experience. Moreover, 57 study participants (38%) were from health centers while 59 (39.3%) were from district or zonal hospitals and 34 (22.7%) from referral hospitals. A significantly higher proportion of study participants from hospitals were bachelor degree holders \((P < 0.001)\) (Table 2).

Competence in providing labor, delivery, and immediate postpartum care
We estimated proportion of competent midwives based on average performance scores in the 13 domains. Accordingly, 16.5% of midwives were rated incompetent (had unsatisfactory performance), 72.4% were competent (had satisfactory performance), and 11.1% were outstanding (had superior performance). A relatively higher level of unsatisfactory performance \((20.1–29.3\%)\) was observed in rapid initial evaluation, history taking, partograph use, infection prevention, and immediate postpartum care tasks, in descending order. Eleven midwives did not use partograph and were excluded from the analysis on partograph skill. Ten of them decided not to use partograph because the women they attended were in second stage at the time of admission. One provider did not have a partograph in the facility at the time of the study (Fig. 1). We also found that higher percent of midwives working in hospitals were competent than those in health centers; however, the overall difference was not statistically significant \([P = 0.065]\) [Table 3]. Reliability [internal consistency] coefficient of the 13 aspects of performance as measured by our tool generated a Cronbach’s Alpha of 0.94.

Competence in managing obstetric and newborn complications
A total of 54 obstetric and newborn complications were observed during data collection requiring emergency care. These were first and second degree vaginal and perineal tear, 21 \((38.9\%)\), prolonged labor, 11 \((20.4\%)\), birth asphyxia, 10 \((18.5\%)\), breech presentation, 5 \((9.3\%)\), severe pre-eclampsia/eclampsia, 3 \((5.5\%)\), retained placenta, 2 \((3.7\%)\), and atonic postpartum hemorrhage, 2 \((3.7\%)\). We were able to assess performance of 45 midwives \((30\%)\) in managing the complications. The most frequently observed emergency care were vaginal and perineal tear repair, 21 \((38.9\%)\), vacuum extraction, 11 \((20.4\%)\), and neonatal resuscitation, 10 \((18.5\%)\). Most midwives, 41 \((91\%)\), were judged competent in managing the obstetric and newborn complications. Unsatisfactory performance was observed in newborn resuscitation \((2\) out of 10), assisting breech delivery \((1\) out of 5), and tear repair \((1\) out of 20). Furthermore, three referrals and one newborn death were witnessed during the study (Fig. 2).

Inventory of drugs, medical equipment, and supplies
Inventory of pre-identified resources necessary for labor, delivery and immediate postpartum care found that only 16.3% of facilities had all the essential drugs, 9.6% all the medical equipment, 7.7% all the medical supplies, 6.3% all the infection prevention (IP) materials, and 14.6% all the records and forms. The proportion of facilities with more than 75% of the items in each category was 32.6% for drugs, 73.1% for equipment, 65.4% for supplies, 47.9% for IP materials, and 43.6% for records and forms. A statistically significant difference was observed between hospitals and health centers, favoring the former, in the availability of drugs \((p = 0.024)\), medical equipment \((p = 0.014)\), IP materials \((p = 0.002)\), and records and forms \((p = 0.034)\). Facilities about which incomplete
or no information on items in a particular domain is provided were excluded from analysis (Table 4).

Perceptions of the work environment
We assessed reported availability of essential resources for provision of quality labor, delivery, and immediate postpartum care. Availability of records and forms (96.7%) and medical supplies (94%) was reported to be nearly universal. However, only 73.3% respondents said that their facility had basic infrastructure for labor, delivery, and postpartum care (furnished delivery room, neonatal corner, postpartum ward, water, toilet, electricity, and infection prevention facilities). Moreover, 18.7, 14.8, and 23.5% of respondents, respectively, said essential medical equipment, emergency medications, and infection prevention materials were not adequate in their facilities. Although most midwives reported availability of job aids in their health facility, job aids for normal labor and delivery and immediate postpartum care were reported relatively less frequently at 69.8 and 62%, respectively. More hospital than health center midwives reported availability of medical equipment ($P = 0.021$), emergency medications ($p < 0.001$), labor and delivery complications job aids ($P = 0.001$), immediate postpartum care job aids ($P < 0.001$), and newborn problems job aids ($P < 0.001$) (Table 5).

### Table 2: Socio-demographic characteristics of midwives observed providing labor, delivery and immediate postpartum care, Ethiopia, 2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hospital ($n = 93$)</th>
<th>Health center ($n = 57$)</th>
<th>All facilities ($n = 150$)</th>
<th>$P$-value#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>50 (53.8%)</td>
<td>31 (54.4%)</td>
<td>81 (54%)</td>
<td>0.941</td>
</tr>
<tr>
<td>Female</td>
<td>43 (46.2%)</td>
<td>26 (45.6%)</td>
<td>69 (46%)</td>
<td></td>
</tr>
<tr>
<td>Age ($n = 121$)</td>
<td></td>
<td></td>
<td></td>
<td>0.949</td>
</tr>
<tr>
<td>20–24 years</td>
<td>35 (49.3%)</td>
<td>26 (52.2%)</td>
<td>61 (50.4%)</td>
<td></td>
</tr>
<tr>
<td>25–29 years</td>
<td>29 (40.8%)</td>
<td>19 (38%)</td>
<td>48 (39.7%)</td>
<td></td>
</tr>
<tr>
<td>30 years and above</td>
<td>7 (9.9%)</td>
<td>5 (10%)</td>
<td>12 (9.9%)</td>
<td></td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Bachelor</td>
<td>43 (46.2%)</td>
<td>9 (15.8%)</td>
<td>52 (34.7%)</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>50 (53.8%)</td>
<td>48 (84.2%)</td>
<td>98 (65.3%)</td>
<td></td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
<td></td>
<td>0.274</td>
</tr>
<tr>
<td>&lt; 24 months</td>
<td>44 (48.3%)</td>
<td>20 (35.1%)</td>
<td>64 (43.2%)</td>
<td></td>
</tr>
<tr>
<td>24–59 months</td>
<td>37 (40.7%)</td>
<td>30 (52.6%)</td>
<td>69 (46.6%)</td>
<td></td>
</tr>
<tr>
<td>&gt; =60 months</td>
<td>10 (11%)</td>
<td>7 (12.3%)</td>
<td>17 (11.5%)</td>
<td></td>
</tr>
</tbody>
</table>

# Chi-square test

**Fig. 1:** Competence of midwives in providing labor, delivery and immediate postpartum care, Ethiopia, 2015
We also assessed perceived availability of learning and performance improvement opportunities. Midwives reported attending an average of two deliveries on daily basis (range from 2 to 3 births per week to 7 births per day); and 62.7% said they encountered obstetric complications or complex cases at least weekly. Majority of respondents reported knowledge and skills update training in the last 2 years (74%), regular supportive supervision visits (61%), structured case discussion about maternal and newborn care (57.3%), and maternal death review or clinical audit in their facility (72.7%). However, fewer percentages of respondents were trained on basic emergency obstetric and newborn care (BEmONC) (31.3%), essential newborn care (ENC) or helping babies breathe (HBB) (26.7%), prevention of mother to child transmission of HIV (PMTCT) (34.7%), and infection prevention (IP) (9.3%). Lack of training was also mentioned as a barrier to give quality labor and delivery services in the open ended question by 25.3% of study participants. Likewise, only 48% said the Ministry of Health (district health office, zonal health department, or regional health bureau) conducted supervisory visits and only 44.7% were visited at least quarterly. Moreover, only 28% reported getting recognition, incentive or reward of any sort for improved performance in labor and delivery services (Table 5).

We found that a higher proportion of respondents from hospitals reported exposure to complicated cases ($P < 0.001$), case discussion ($P = 0.019$), and maternal death review or audit ($P < 0.001$). On the other hand, a higher percent of midwives from health centers than hospitals reported receiving supervision ($p < 0.002$),...
training, and reward/recognition, although the latter two were not statistically significant (Table 5).

**Discussion**

Our findings demonstrate the presence of gaps to provide quality intrapartum care in government health facilities in Amhara Regional State of Ethiopia. There were major deficits in availability of essential physical resources and mechanisms for continuous performance and quality improvement. A significant proportion of midwives were also found incompetent.

Global maternal and newborn health care standards state that competent staff must be available at all times to provide quality care to every woman and every newborn [38]. While it is encouraging that most midwives in our study are competent in providing intrapartum care, the significant proportion of midwives who displayed unsatisfactory performance in routine child birth care (1 in 6), and basic emergency obstetric and newborn care (1 in 11) makes it difficult to guarantee that every mother and every newborn will receive high quality care. It is also noteworthy that more substantial gaps were observed in rapid initial evaluation, history taking, partograph use, infection prevention, assisting normal birth, immediate postpartum care, and newborn resuscitation. Systematic review of evidence-based guidelines also recommend partograph use for monitoring labor [40]. While acknowledging health systems weaknesses may limit partograph use and effectiveness, a realist review of the partograph has also suggested that it may improve outcomes in low resource settings [41]. In our study, aside from a quarter of midwives who demonstrated unsatisfactory performance in partograph

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hospitals (n = 19)</th>
<th>Health centers (n = 37)</th>
<th>All facilities (n = 56)</th>
<th>P-value#</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drugs (8 items)</strong></td>
<td>n = 15</td>
<td>n = 34</td>
<td>n = 49</td>
<td>0.024</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>2 (13.3%)</td>
<td>7 (20.6%)</td>
<td>9 (18.4%)</td>
<td></td>
</tr>
<tr>
<td>50–75%</td>
<td>4 (26.7%)</td>
<td>20 (58.8%)</td>
<td>24 (49.0%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>9 (60%)</td>
<td>7 (20.6%)</td>
<td>16 (32.6%)</td>
<td></td>
</tr>
<tr>
<td><strong>Medical equipment (22 items)</strong></td>
<td>n = 16</td>
<td>n = 36</td>
<td>n = 52</td>
<td>0.014</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>-</td>
<td>2 (5.6%)</td>
<td>2 (3.8%)</td>
<td></td>
</tr>
<tr>
<td>50–75%</td>
<td>-</td>
<td>12 (33.3%)</td>
<td>12 (23.1%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>16 (100%)</td>
<td>22 (61.1%)</td>
<td>38 (73.1%)</td>
<td></td>
</tr>
<tr>
<td><strong>Medical supplies (11 items)</strong></td>
<td>n = 18</td>
<td>n = 34</td>
<td>n = 52</td>
<td>0.39</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>1 (5.6%)</td>
<td>3 (8.8%)</td>
<td>4 (7.7%)</td>
<td></td>
</tr>
<tr>
<td>50–75%</td>
<td>3 (16.6%)</td>
<td>11 (32.4%)</td>
<td>14 (26.9%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>14 (77.8%)</td>
<td>20 (58.8%)</td>
<td>34 (65.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Infection prevention (IP) materials (16 items)</strong></td>
<td>n = 15</td>
<td>n = 33</td>
<td>n = 38</td>
<td>0.12</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>-</td>
<td>5 (15.1%)</td>
<td>5 (10.4%)</td>
<td></td>
</tr>
<tr>
<td>50–75%</td>
<td>5 (33.3%)</td>
<td>15 (45.5%)</td>
<td>20 (41.7%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>10 (66.7%)</td>
<td>13 (39.4%)</td>
<td>23 (47.9%)</td>
<td></td>
</tr>
<tr>
<td><strong>Records and forms</strong> (6 items)**</td>
<td>n = 19</td>
<td>n = 36</td>
<td>n = 55</td>
<td>0.034</td>
</tr>
<tr>
<td>&lt; 50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>50–75%</td>
<td>7 (36.8%)</td>
<td>24 (66.7%)</td>
<td>31 (56.4%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 75%</td>
<td>12 (63.2%)</td>
<td>12 (33.3%)</td>
<td>24 (43.6%)</td>
<td></td>
</tr>
</tbody>
</table>

*Drugs include oxytocin, intravenous solutions, magnesium sulfate, calcium gluconate, oxygen gas, adrenaline, lidocaine, and TTC eye ointment
*Medical equipment include blood pressure apparatus, thermometer, adult stethoscope, fetoscope, examination table, delivery coach, delivery set, stepping stool, IV stand, watch clock, screen, vaginal speculum, episiotomy kit, suction bulb, ambu bag, infant face mask or suction machine, newborn resuscitation table, radiant warmer, light source, weighing scale, autoclave, and refrigerator
*Medical supplies include surgical glove, cord tie, chromic catgut, gauze/cotton, blanket for wrapping newborn, IV cannula, IV sets, needle and syringe, urinary catheter, container for 0.5 chloride solution, and tape
*IP materials include antiseptics/alcohol hand rub, safety box, utility gloves, soap at all sinks, high level disinfectant, alcohol 70%, chlorine solution for decontamination, water, examination glove, single personal use hand towel, tight fitting containers for used linens, tight fitting containers for trash, towels for drying newborns, protective footwear, protective eyewear, and plastic apron
*Records and forms include delivery log, partograph, service delivery guidelines, site specific protocols, educational charts and patient documents

#Chi-square test
use, additional ten midwives excused themselves from completing a partograph wrongly thinking there was no need to use a partograph if a woman was in second stage of labor at admission. Our study findings also indicated that midwives working in health centers had larger gaps in their capacity than those from hospitals in almost all domains. However, the difference in the composite score was not statistically significant possibly due to small sample size (Table 3). Although direct comparison is difficult due to differences in methodology, past studies from Ethiopia and other resource-constrained settings have also pointed to shortfalls in competence of midwives to provide intrapartum care [16–21, 24, 42, 43].

While weaknesses in quality of the health workforce are acknowledged to be pervasive, there are also calls for better measurement and improvement of health workforce performance (especially in low and middle in-come countries) to achieve global health development goals [13–15, 44–46]. We believe our use of direct observation to measure performance of midwives in workplace settings responds to the call for better measurement of quality of intrapartum care. The gaps uncovered also warrant strengthening preservice midwifery education with focus on curriculum review, faculty development, use of simulation methods, and strengthening accreditation and regulation processes, among other things [46].

All midwives have a responsibility to undertake continuing professional development activities [47] and ensuring a high performing midwifery workforce also requires creating a work environment that fosters continuous quality improvement in every facility [38]. Provided effective implementation, in-service training or continuing professional development, supervision and coaching, audit, feedback, and job aids coupled with an enabling environment can improve provider performance [48–54]. However, our results did not show every midwife had sufficient opportunities for in-service training in general and those pertaining to intrapartum care (BEmONC, ENC or HBB, IP, and PMTCT) in particular. While it is surprising that majority of respondents did not receive training on these high priority topics, it demonstrates access to in-service training on intrapartum care remains limited in Ethiopia [18, 42]. One explanation could be that pre-service education systems are producing midwives more rapidly than the capacity of in-service training systems to cope. Another possible explanation is gaps in targeting relevant in-service training to those who need it the most.

Other opportunities for practice-based learning and improvement (like supportive supervision, structured case discussion, clinical audit or maternal death review, job aids, and performance-based reward or incentive) were also found inadequate. Generally speaking, a higher proportion of midwives working in hospitals reported learning and quality improvement opportunities with the exception of supportive supervision visit, which was reported significantly more frequently from health centers. Our findings are consistent with program and study reports that highlighted health systems weaknesses in implementing audit and supportive supervision. Maternal death surveillance and response systems in Ethiopia

### Table 5 Perceptions of midwives regarding availability of resources and performance improvement opportunities for labor, delivery and immediate postpartum care, Ethiopia, 2015

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hospital midwives</th>
<th>Health center midwives</th>
<th>Total</th>
<th>P-value***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job aids on normal labor and delivery (L &amp;D)</td>
<td>70 (75%)</td>
<td>35 (61.4%)</td>
<td>105(69.8%)</td>
<td>0.079</td>
</tr>
<tr>
<td>Job aids on managing complications of L&amp;D</td>
<td>83 (89.3%)</td>
<td>39 (68.4%)</td>
<td>122(81.3%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Job aids for immediate postpartum care</td>
<td>70 (75.3%)</td>
<td>23 (40.4%)</td>
<td>93(62.0%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Job aid for managing newborn problems</td>
<td>88 (94.6%)</td>
<td>42 (73.7%)</td>
<td>130(86.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>IP equipment and supplies</td>
<td>76 (80.9%)</td>
<td>40 (70.2%)</td>
<td>116(76.5%)</td>
<td>0.151</td>
</tr>
<tr>
<td>Medical equipment</td>
<td>81 (87.1%)</td>
<td>41 (71.9%)</td>
<td>122(81.3%)</td>
<td>0.021</td>
</tr>
<tr>
<td>Medical supplies</td>
<td>87 (93.5%)</td>
<td>54 (94.7%)</td>
<td>141(94%)</td>
<td>0.766</td>
</tr>
<tr>
<td>Emergency medications</td>
<td>87 (94.6%)</td>
<td>41 (71.9%)</td>
<td>128(85.2%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Records and forms</td>
<td>88 (94.6%)</td>
<td>57 (100.0)</td>
<td>145(96.7%)</td>
<td>0.075</td>
</tr>
<tr>
<td>Basic infrastructurea</td>
<td>81 (73.6%)</td>
<td>29 (26.4%)</td>
<td>110(73.3%)</td>
<td>0. &lt; 0.00</td>
</tr>
<tr>
<td>Encounter obstetric complications at least weekly</td>
<td>64 (69.6%)</td>
<td>23 (40.3%)</td>
<td>87(58.4%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Technical update in the last 2 years</td>
<td>65 (69.9%)</td>
<td>46 (80.7%)</td>
<td>111(74.0%)</td>
<td>0.141</td>
</tr>
<tr>
<td>Supportive supervision or coaching</td>
<td>48 (51.6%)</td>
<td>44 (77.2%)</td>
<td>92(61.3%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Case discussion or seminarb</td>
<td>60 (64.5%)</td>
<td>26 (45.6%)</td>
<td>86(57.3%)</td>
<td>0.019</td>
</tr>
<tr>
<td>Maternal death review or clinical audit</td>
<td>81 (87.1%)</td>
<td>28 (49.1%)</td>
<td>109(72.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Performance-based recognition or reward</td>
<td>23 (24.7%)</td>
<td>19 (33.3%)</td>
<td>42(28.0%)</td>
<td>0.290</td>
</tr>
</tbody>
</table>

*aBasic infrastructure includes equipped delivery room, neonatal corner, postpartum ward, water and infection prevention facilities, toilet and electricity. bCase presentation, seminar, structured discussion, morning session or grand round. **Chi-square test
A study of barriers to quality EmONC from Ethiopia has also identified gaps in supervision including, but not limited to, being sporadic, unsupportive, and donor-driven [42]. All these findings indicate the need for strengthening health worker performance and quality improvement strategies in health facilities.

Global standards for improving quality of maternal and newborn care also require health facilities to ensure availability of basic infrastructure and adequate stock of essential equipment, drugs and supplies for intrapartum care [38]. However, the major gaps in availability of essential resources for provision of labor, delivery and immediate postpartum care in our study (Tables 4 and 5) is concerning as it would affect the ability and motivation [57] of midwives to provide quality care to mothers and newborns. A higher proportion of health centers than hospitals had resource gaps. This assumes greater significance when one takes into account the fact that health centers are the primary and most accessible birthing facilities for most women in Ethiopia. In addition to reducing effectiveness of maternal and newborn health-care, weak infrastructure can undermine the demand to deliver in health centers [58].

Maternal and newborn care surveys from Ethiopia, Tanzania, Uganda, Kenya, Namibia, and Bangladesh have all reported gaps in availability of essential commodities. A basic emergency obstetric and newborn care survey of health centers from Addis Ababa, Ethiopia, found that only 50% had parenteral antibiotics and diazepam; none had magnesium sulfate; and only 90% had a functional vacuum extractor [18]. Inadequate equipment and supplies, and lack of knowledge and skills in performing EmONC were the two main challenges identified in a study of maternity care services in Moshi urban district of northern Tanzania [24]. Another study in Tanzania involving qualitative interviews with nurse-midwives in basic and comprehensive EmONC facilities also revealed that nurse-midwives lacked essential supplies to do their job [25]. A health facility-based survey from Karamoja region of Uganda reported lack of equipment and supplies as the most frequent reason for not performing EmONC signal functions and found that 50% of health centers lacked basic equipment for normal delivery and some lacked equipment for neonatal resuscitation as well as consumable supplies and drugs [26]. Emergency obstetric care readiness assessment in rural northwest Bangladesh found that availability of EmONC specific medicines and commodities was 62% in public facilities while coverage for equipment and supplies was 90%. Half of the respondents also mentioned not having essential medicines and commodities in stock as main constraint to EmONC provision [27]. Evaluation of clinical quality of maternal and newborn care in Kenya and Namibia found gaps in essential drugs and commodities including oxytocin, magnesium sulfate, antibiotics, and incubator [28].

Our study findings add to a growing body of literature reporting health system weaknesses to ensure quality of maternal and newborn healthcare. The 2016 Lancet maternal health series has shown access to good quality and evidence-based care remains inadequate especially in low income countries owing to gaps in provider skill and number, facility capability, basic infrastructure for intrapartum care, availability and implementation of evidence-based guidelines, and access to care, among other things [40]. Recent multi-country analyses of health systems bottlenecks in high burden countries have also acknowledged providing quality labor and childbirth care, basic newborn care, and neonatal resuscitation is a challenge, with the most significant weaknesses reported from African countries. Health financing, health workforce, service delivery, and essential commodities related challenges were identified as the major bottlenecks [59, 60]. A systematic review of providers’ perspectives on barriers to quality midwifery care in low and middle income countries have also found professional barrier, which includes, but is not limited to, gaps in education and training, and lack of equipment and supplies, was the most frequently mentioned impediment [61].

**Strengths and limitations**

We believe the assessment of quality of care provision during the most critical periods for the mother and the newborn (labor, childbirth, and the immediate postpartum period) makes our study timely and relevant for the global and national maternal and newborn health community. Our attempt to measure the structure (availability of resources for intrapartum care), process (competence of midwives in routine and emergency obstetric and newborn care), and outcome (maternal and newborn morbidity and mortality) dimensions of quality of care as well as strategies for continuous performance and quality improvement is also noteworthy. Moreover, the use of multiple methods including direct observation to measure performance and availability of essential resources lends credibility to our findings. The assessment of quality of both routine childbirth care and emergency care is also important. However, the exclusion of facilities with low volume of delivery services (less than one delivery per day), replacement of some health centers with hospitals (due to challenges with finding expected number of midwives and laboring mothers), and missing data (especially during inventory of commodities) may be considered limitations. Even if we provided brief descriptors of performance in the data collection tool, trained data collectors
and conducted pretesting, the subjective judgement involved in performance evaluation can be a source of measurement error but we could not estimate inter-rater or intra-rater reliability. However, internal consistency of the items was found to be very high (Chronbach’s Alpha of 0.94) suggesting the reliability of our results.

Conclusions
Our study findings indicate the state of the quality of midwifery care during labor, delivery and immediate postpartum period in government health facilities in Amhara Regional State of Ethiopia. Most midwives are competent in routine childbirth care and basic emergency obstetric and newborn care. However, the conditions to provide quality intrapartum care for every woman and newborn cannot be considered optimal. One out of six midwives is not competent in routine childbirth care and one out of 11 midwives is not competent in basic emergency obstetric and newborn care. Many midwives do not have access to sufficient learning and performance improvement opportunities. And most facilities lack essential resources for provision of quality labor, delivery and immediate postpartum care. The gaps seem to be worse in health centers except for supportive supervision and possibly training and performance based recognition. Substantial improvements are needed especially in availability of resources and performance and quality improvement strategies to provide high quality midwifery care during childbirth. Midwifery education should also be strengthened.

Additional files

Additional file 1: Workplace performance assessment recording tool (Interview questionnaire and direct observation rating scales). (PDF 78 kb)
Additional file 2: Facility inventory checklist. (PDF 113 kb)
Additional file 3: Complications management checklists. (PDF 92 kb)
Additional file 4: Data. (SAV 103 kb)

Abbreviations
BEmONC: Basic emergency obstetric and newborn care; EmONC: Emergency obstetric and newborn care; ENC: Essential newborn care; HBB: Helping babies breathe; IP: Infection prevention; L&D: Labor and delivery; MMR: Maternal mortality ratio; NMR: Neonatal mortality rate; PMTCT: Prevention of mother to child transmission of HIV

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Availability of data and materials
All relevant data analyzed during this study are included in this published article and in the additional materials.

Authors’ contributions
TY guided design of the study, contributed to data analysis, and led development and revision of the manuscript. FA contributed to design of the study, supervision of data collection, data analysis, and development and revision of the manuscript. LB led data analysis and contributed to development and revision of the manuscript. YA, EM, AK and DA contributed to the study design, supervision of data collection, data analysis, and manuscript development. JVR, S and YMK critically reviewed and improved the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate
Ethical approval was obtained from the Johns Hopkins School of Public Health Institutional Review Board and permission provided by the Amhara Regional Health Bureau prior to data collection. Informed consent was obtained from facility managers, midwives and women whose intrapartum care was observed. Confidentiality was ensured in reporting findings.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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References


CHAPTER 5

Cultural competence among maternal healthcare providers in Bahir Dar City Administration, Northwest Ethiopia: cross-sectional study.

Cultural Competence among Maternal Healthcare Providers in Bahir Dar City Administration, Northwest Ethiopia: Cross sectional Study

Amanu Aragaw 1*, Tegbar Yigzaw 2, Desalegn Tetemke 3 and Wubalem G/Amlak 4

Abstract

Background: Cultural competency is now a core requirement for maternal health providers working in multicultural society. However, it has not yet received due attention in Ethiopia. This study aimed to determine the level of cultural competence and its associated factors among maternal health care providers in Bahir Dar City Administration, Northwest Ethiopia.

Methods: Institution based cross-sectional study was carried out using both quantitative and qualitative methods. Maternal health care providers from all health facilities were our study participants. Structured Questionnaire with some modification of Campinha Bacote’s tool was used to collect quantitative data from health workers and semi structured guide line was used for qualitative data among women. While quantitative data analysis was done using SPSS, qualitative data was analyzed using open code software. P-value of less than 0.05 was taken to determine statistical significance. Cronbach’s alpha was used to test internal reliability and a factor loading of 0.3 or greater was the criterion used to retain items.

Result: Two hundred seventy four health workers and seven women were involved in the study. The overall competency level was 57.3 % thought vary in different subscales or stages. Of the cultural competent health workers near to three fourth (73.0 %) were in awareness stage which is the earliest stage of competence in which individuals were aware only their own culture but not the world view of their clients. The voices of mothers in the qualitative assessment also showed discordance in cultural competence with their healthcare providers. Female health workers almost six times [AOR,5.5; 2.71, 11.30] more competent than male providers and those who got in-service training related to maternal care provided services more culturally competent than their counter parts with [AOR,3.5; 1.4, 8.64]. Reliability Cronbach’s a coefficient value of cultural competence subscales showed 0.672, 0.719, 0.658, 0.714, and 0.631 for cultural awareness, knowledge, skill, encounter and desire, respectively.

Conclusions: The overall competence level of health workers was low and the mean competence level falls in awareness stage in the continuum of culturally incompetent, culturally aware, culturally competent, and culturally proficient indicated that the providers were aware of only their own culture but not the world view of their clients. The voices of mothers also showed that they were dissatisfied for the services they got and the interactions they had with health care providers. Hence, we recommend on job training of health workers and incorporation of cultural components in the curriculum of health workers as it would be the key to provide culturally acceptable services.

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Background

Maternal mortality remains a major public health challenge. Globally, it is the leading cause of death among females aged 15–49 years old; 99% of maternal deaths occur in developing countries [1, 2].

Ethiopia’s maternal morbidity and mortality rates are among the highest in the world [3] (Rob Stephenson: MaNHEP Base line report Part I, unpublished). Maternal mortality ratio is 676 per hundred thousand live births and 1 in 28 women have a lifetime risk of dying from pregnancy complications [5]. Each year, an estimated 22,000 women and 100,000 newborns die from complications related to childbirth. Most of these deaths occur at home due to lack of basic health care (Rob Stephenson: MaNHEP Base line report Part I, unpublished).

Utilization of maternity care services has paramount importance; it affects the well-being of the mothers as well as their children [1, 2]. This being the case, however, utilization of maternity care services in Ethiopia is extremely low even by the standards of most African countries (Ethiopian Society of Population Studies: Maternal health seeking behavior in Ethiopia, Unpublished). Recent data showed that Ethiopian antenatal coverage was 33.9% and delivery service by trained health professionals was only 10% [5].

Practices during pregnancy and child birth are highly influenced by cultural values and beliefs [4] Culture is an integrated pattern of learned beliefs and behaviors that can be shared among groups. It includes thoughts, styles of communicating, ways of interacting, views on roles and relationships, values, practices, and customs [7]. Although the reasons for underutilization are many and complex, socio-cultural barriers need to be overcome if women are to access technical services and information that can prevent maternal mortality and morbidity [8]. A recent literature review on cultural barriers to seeking maternal healthcare services in Ethiopia concluded that cultural and religious beliefs affect maternal health service utilization (Rob Stephenson: MaNHEP Base line report Part I, unpublished).

A community based study done in Ethiopia recognized that women and their families were constrained by a number of factors which include the fact that important traditions and customs around birth were not recognized by health care providers[8]. Preference of birth attendants by known & trusted relatives or neighbors that are familiar with cultural context and norms; massage of the abdomen; squatting, kneeling and lying down position during delivery; ritual foods or drinks either during or after delivery; prayer or sprinkling of holy water as religious or spiritual elements are all among culturally recognized and valued components of safe childbirth by most Ethiopian women (Craig Hadley: MaNHEP Formative Research Report, unpublished).

Maternal health for Ethiopian women is surrounded with a number of cultural factors ranging from individual practices to institutional factors. In the first place, the traditional perception of pregnancy and childbirth is that of a natural condition, not requiring special health care. Women tend to be the major clients of the traditional healers and they then do not get proper medical care. Health facilities do not allow close relatives or friends to support the mother during labor (Craig Hadley: MaNHEP Formative Research Report, unpublished; and Charlotte W: Safe Motherhood Community-Based Survey, unpublished).

Child birth process in Ethiopia is viewed as a spiritual experience and the spiritual support provided by the mother of the woman is the most important support needed. Most of the women deferred the practice of religious rituals associated with childbirth during their hospitalization because they believed that the hospital environment was not conducive to these practices [10, 11].

Ethiopia is also home to diverse cultural and ethnic groups with implications for childbearing practices [12].

Cultural competence in health care describes the ability of systems to provide care to clients with diverse values, beliefs and behaviors, including tailoring delivery to meet their social, cultural, and linguistic needs [13, 14]. Cultural competence of healthcare providers is an educative process involving developing self-awareness, appreciating difference, valuing cultural practices other than one’s own, and acting flexibly in ways that accommodate these values [14].

Understanding clients’ beliefs can help providers align their services with their ideas or, when necessary, address local misconceptions. Providers can also bridge gaps by expressing respect for the clients’ beliefs and drawing connections between these beliefs and medical models of health [15]. On the other hand, lack of understanding and sensitivity to cultural beliefs and traditions on the part of providers can become barrier to use of maternal health services [16].

Despite its importance, to the best of our knowledge, there are no published studies on the subject in Ethiopia. Hence, we assessed cultural competence of maternal health care providers working in Bahir Dar City, Northwest Ethiopia.

Methods

Study design and area

Institution based cross-sectional study using quantitative and qualitative methods was conducted among health care providers in April 2012.

The study was conducted in Bahir Dar City, which is the capital city of the Amhara National Regional State,
the second most populous region in the Federal Democratic Republic of Ethiopia. The city is subdivided into 17 administrative kebeles (the smallest administrative units in Ethiopia). The projected population number in 2012 was estimated to be 252,256, of whom 131,930 were females. The number of females in reproductive age group were 58,019, sharing 23% of the total population [17].

Study population and sampling
The quantitative study included health care professionals working in maternal care units (antenatal, labor and delivery, and postnatal clinics) at least for 6 months in all public and private healthcare facilities. Before the actual data collection census was conducted in each healthcare facility to identify potential healthcare professionals that could be study subjects. Based on our assessment 326 maternal health providers met the inclusion criteria and it was planned to include all in our study, but on the actual date of data collection 286 were available at their respective health facilities and participated in the study.

Qualitative data were collected from women who were attending antenatal services, mothers who had given birth and were in their waiting room, and women who came for postnatal visit. Women who had at least one antenatal contact with health care providers prior to the current visit and were believed to explain themselves and give rich information were purposively selected to participate in the study. Interviewing was continued until redundancy of ideas. Questions that reached saturation were removed and new questions were added whenever an information gap was identified and a total of seven women participated in the qualitative study.

Data collection
Quantitative data were collected by interviewing using a structured cultural diversity questionnaire adapted from Campinha-Bacote’s model for cultural competency [14]. The instrument consisted of two sections: demographic characteristics of the healthcare providers and five point scale Likert type items intended to measure the respondents’ level of cultural competence [i.e., cultural awareness, cultural knowledge, cultural skills, cultural encounters and cultural desire]. The qualitative data were collected by conducting in-depth interviews of women who were exiting health facilities after receiving prenatal, delivery and postnatal services. We used a semi-structured interview guide to explore women’s perception of cultural, gender preference for maternal care services, advice they got from health care providers, cultural practices undertaken at home but prohibited in the health care institution, and to rate the overall management received.

Operational definition
Cultural awareness is the lowest requirement in cultural competence. It is conducting self-examination of providers’ own biases towards women’s cultures and the in-depth exploration of one’s cultural and professional background [18].

Cultural skill refers to the ability of health care providers to conduct an assessment to collect relevant cultural data regarding the woman’s presenting problem as well as accurately conducting a culturally-based physical assessment [14].

Cultural encounter refers to directly engaging in face-to-face cultural interactions with clients from culturally diverse backgrounds in order to modify existing beliefs about a health related culture of women and to prevent possible stereotyping [14].

Cultural competence is an educative process that involves developing self-awareness, learning to appreciate difference, valuing cultural practices other than one’s own, and acting flexibly in ways that accommodate these values [14].

Scores for cultural competence of maternal healthcare providers were interpreted as follows: 91–100% = culturally proficient; 75–90% = culturally competent; 51–74% = culturally aware; 25–50% = culturally incompetent [7].

Cultural competent- health workers were labeled culturally competent if they answered ≥75% of questions in favorable way.

Culturally incompetent: health workers were labeled culturally incompetent if they answered <75% of questions.

Data analysis
The quantitative data were entered to Epi Info and exported to SPSS for analysis. Cultural competence on each sub scale was computed using IAPCC-R (Inventory for Assessing the Process of Cultural Competence among Health Care Professionals-Revised). The following response categories established by the researchers were used to interpret the responses: <1.50 = Strongly Disagree; >1.50 − 2.50 = Disagree; >2.50 − 3.50 = Undecided; >3.50 − 4.50 = Agree; >4.50 = Strongly Agree.

Both bivariate and multivariate analyses were done. All factors with a p-value <0.2 in the bivariate logistic regression analysis were further fit to multivariate logistic regressions for better prediction of determinants. The Hosmer-Lemeshow goodness-of-fit statistic was used to assess whether the necessary assumptions for the application of multiple logistic regression were fulfilled. Crude and adjusted Odds ratio with 95% confidence intervals was computed. P-Value less than 0.05 were taken as significant. Cronbach’s alpha was used to test internal reliability of Likert types of items and a factor loading of 0.3 or greater was the criterion used to retain items.
Qualitative data analysis was done first by transcribing the tapes and translating the text from local language (Amharic) into English and subsequently conducting thematic analysis using the Open Code software.

**Ethical consideration**
The study was ethically approved by research ethical committee review board of university of Gondar. Before Commencing data collection legal permission was obtained from officials of districts and health institutions. Moreover, all the study participants were informed about the purpose of the study and their right to refuse. Then consent (written for qualitative and oral for quantitative) was obtained from each study subjects. Strict confidentiality was assured through anonymous recording and coding and the questionnaire were kept locked.

**Results**

**Quantitative result**

**Socio demographic characteristics**
A total of 286 health workers [95.8 % response rate] were participated in the quantitative study. About half [50.7 %] were working in hospitals. The mean age was 30.34 [±6.64] years. Most study participants were nurses [74.8 %], females [60.2 %], Orthodox Christians [88 %] and of Amhara ethnic group [82.6 %] (Table 1).

**Cultural competence subscales**

**Cultural Awareness**
Maternal health workers were asked 18 questions to explore their level of cultural awareness regarding the cultural requirement of the women they were serving and the result revealed that more than eight out of ten health workers (83.6 %) preferred non individualized, universal approach of management for all women regardless of residence, religion or other differences. More than six out of ten [62.9 %] of them agreed that as far as the service was given gender difference among health-care providers had no impact on service utilization of women and, 34.3 %, agreed on excluding family members from delivery room for women in labor (Table 2).

The items were checked for reliability using Cronbach’s alpha internal consistency coefficient and the overall alpha value was 0.672. The factor loading of the items retained ranged from 0.33 to 0.54. Three items, number 6, 7 and 10 as indicated in Table 2, which had rather item-total correlations less than 0.3 were removed from the sub scale.

The result of Inventory for Assessing the Process of Cultural Competence among Health Care Professionals-Revised [IAPCC-R] for this subscale revealed that 20 % were found to be culturally incompetent; 60.2 % were culturally aware; 17.2 % culturally competent and the 2.2 % were proficient.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Socio demographic characteristics of maternal healthcare providers in Bahir Dar City Administration, April, 2012 (n = 274)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-demographic characteristic</td>
<td>Number</td>
</tr>
<tr>
<td>1. Health facility</td>
<td></td>
</tr>
<tr>
<td>• Hospital</td>
<td>139</td>
</tr>
<tr>
<td>• Health center</td>
<td>88</td>
</tr>
<tr>
<td>• Clinic</td>
<td>35</td>
</tr>
<tr>
<td>• Reproductive center</td>
<td>12</td>
</tr>
<tr>
<td>2. Gender</td>
<td></td>
</tr>
<tr>
<td>• Male</td>
<td>109</td>
</tr>
<tr>
<td>• Female</td>
<td>165</td>
</tr>
<tr>
<td>3. Age</td>
<td></td>
</tr>
<tr>
<td>• 20–29</td>
<td>154</td>
</tr>
<tr>
<td>• 30–39</td>
<td>91</td>
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<tr>
<td>• 40–49</td>
<td>25</td>
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<tr>
<td>• 50 +</td>
<td>4</td>
</tr>
<tr>
<td>4. Place of birth</td>
<td></td>
</tr>
<tr>
<td>• Urban</td>
<td>169</td>
</tr>
<tr>
<td>• Rural</td>
<td>105</td>
</tr>
<tr>
<td>5. Religion</td>
<td></td>
</tr>
<tr>
<td>• Orthodox Christian</td>
<td>241</td>
</tr>
<tr>
<td>• Muslim</td>
<td>17</td>
</tr>
<tr>
<td>• Others</td>
<td>16</td>
</tr>
<tr>
<td>6. Ethnicity</td>
<td></td>
</tr>
<tr>
<td>• Amhara</td>
<td>226</td>
</tr>
<tr>
<td>• Tigre</td>
<td>10</td>
</tr>
<tr>
<td>• Agaw</td>
<td>18</td>
</tr>
<tr>
<td>• Oromo</td>
<td>8</td>
</tr>
<tr>
<td>• Others</td>
<td>12</td>
</tr>
<tr>
<td>7. Mother tongue</td>
<td></td>
</tr>
<tr>
<td>• Amharic</td>
<td>243</td>
</tr>
<tr>
<td>• Agegewegna</td>
<td>14</td>
</tr>
<tr>
<td>• Others</td>
<td>17</td>
</tr>
<tr>
<td>8. Language other than first language and Amharic</td>
<td></td>
</tr>
<tr>
<td>• Agegewegna</td>
<td>7</td>
</tr>
<tr>
<td>• Oromifa</td>
<td>9</td>
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<tr>
<td>• Tigregna</td>
<td>15</td>
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<td>• Others</td>
<td>10</td>
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<tr>
<td>9. Profession</td>
<td></td>
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<td>• Physician</td>
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<tr>
<td>• Midwives</td>
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</tr>
<tr>
<td>• Health officer</td>
<td>12</td>
</tr>
<tr>
<td>• Nurse</td>
<td>205</td>
</tr>
<tr>
<td>10. Maternal care related In-service training</td>
<td></td>
</tr>
<tr>
<td>- Yes</td>
<td>146</td>
</tr>
<tr>
<td>- No</td>
<td>128</td>
</tr>
</tbody>
</table>
Cultural knowledge

The result indicated that nearly 10% of the health workers did not know the greeting style of women they were serving, and similar proportion did not agree on the importance of knowing population percentages of the major ethnic groups, and on being familiar with key-words and phrases of women with limited proficiency in Amharic language (the working language) to adjust health care delivery. In addition, 28.8% of the health workers did not know women’s perception and practice of discarding colostrums (first milk rich in antibodies and minerals that a mother’s breasts produce after giving birth) in their community. The Cronbach’s alpha value of items was 0.719 and only one item had corrected Item-total Correlation below the cutoff point.

The result of Inventory for Assessing the Process of Cultural Competence among Health Care Professionals-Revised [IAPCC-R] for this subscale showed that 10.2% were found to be culturally incompetent; 49.6% were culturally aware; 19.7% culturally competent and the 20.4% were proficient.

Cultural skill

More than one-fifth [21.2%] of the participants did not allow a woman in labor for praying even if requested. Nineteen point seven percent of the health workers did not give chance for hygienic procedures to be taken by mothers or their families. One third (33.9%) restricted mothers from back lying position during delivery, and 35% allowed only delivery couches. More than three fourth [77%] of health workers did not feel comfortable in asking client's ethnic background.

Result of IAPCC-R of the subscale showed that 42.7, 28.1, 16.4, and 12.8% of the participants were culturally competent, proficient, aware, and incompetent respectively. The reliability Cronbach’s alpha reading for elements was 0.658. All had Corrected Item total Correlation value above the cutoff point.

Cultural encounter

Nearly to 70% (69.3%) of the participants never asked to know the traditional needs of families or delivered women on burial of placenta before throwing away it. Results of the IAPCC-R for the cultural encounter subscale found that 84.3% were culturally incompetent, 12.0% were aware, and only 1.8% and 1.5% were competent and proficient, respectively. This value of the items indicated that respondents were interacting with diverse community member occasionally or never at all. All the
items had loading factor above 0.3 with Cronbach’s alpha 0.714.

Cultural desire
Around 41% of the respondents did not agree to incorporate culture to their clinical service. The result of IAPCC-R showed that 11.7, 33.9, 30.7, and 23.7% of maternal health workers were culturally incompetent, aware, competent, and proficient respectively. The overall Cronbach’s Alpha level of items in this subscale was 0.631.

The result of cultural competence in the continuum of Campinha-Bacote’s Inventory for Assessing the Process of Cultural Competence-Revised (IAPCC-R) indicated that 9.1% of maternal healthcare workers were culturally incompetent, 33.6% aware, 47.1% competent, and 10.2% proficient. And, the overall cultural competence of the total study participants showed that 57.3% of the respondents were culturally competent while the remaining 42.7% were culturally incompetent. The mean score for the IAPCC-R was 73.0, which falls within the “culturally aware” category in the continuum of culturally incompetent, culturally aware, culturally competent, and culturally proficient.

Logistic regression analysis was conducted to identify predictors for cultural competence. Multivariate analysis found gender, place of birth; facility type and opportunity for in-service training were associated with cultural competence of maternal healthcare providers. Female health care workers were 3.3 times more likely to be competent than males and the association was also strongly significant \( [p = 0.003] \). There was a positive association between competence level and place of birth \( [p = 0.009] \). Health care providers who were born in rural area were 3.60 [95% CI: 1.37, 9.40] times more likely to be culturally competent compared to their urban counterparts. Health care providers who worked in hospital were 63% less likely to be culturally competent compared to those who worked in other health care facilities [AOR 0.37; 95% CI: 0.14, 0.97]. Health care providers who got in-service training related to maternal care were 3.5 times (1.40, 8.64) more likely to be competent than those who did not get the training \( [p = 0.007] \) (Table 3)

Qualitative result
Qualitative information about culturally competent care from their service providers was gathered from women who were receiving antenatal, delivery and postnatal care and the results are grouped into the following themes.

Communication/ provider-client interaction
Majority of women in this study claimed that they did not receive warm greetings from healthcare professionals. Women also mentioned that health workers didn’t tell their health care roles in the institution and lack patience.

Patient preferences and respect
Major complaint voiced by women who came for delivery service in this study was they were forced to deliver in the supine position. None of participants were asked about their favorite position from their health care providers. Even, those women who asked their preferred position to health workers blamed healthcare providers as unresponsive and rude with this regard. For example one participant expressed her sorrow for being prevented from her preferred position during delivery saying:

“My preferred birthing position was kneeling, but since I am here in hospital, I was obliged to deliver in back lying position against my interest.” (25 years, merchant post natal mother)

One of the aspects of maternity care about which women were most dissatisfied was that family members were not allowed to be present during birth

As for the health workers, when you are in labor and get there (hospital), they start to shout at you as if you are a kid. But you know, your relatives are relatives, and as for traditional birth attendants, whether she knows you or not, she respects and communicates you politely.” (34 years, urban dweller during her ANC follow up)

Sex of health workers
Except for one study participant, all had no gender preference for the healthcare provider. They said that, as far as the service was given, they did not mind whether they were examined by males or females

Diet advices and beliefs related to diet
Women were asked to express their beliefs whether there is a kind of food restriction during their pregnancy and the response indicated that larger proportion of them still believe in old unscientific tales. Foods like banana, mango, sugar cane and other sweet foods and fruits were not added to their regular diet as a way of safeguarding their lives and that of the unborn baby. Majority of women believed that eating such inhibited foods during pregnancy would cause prolonged labor, hypertension, and overweight new born. Despite these beliefs however, many of
the study participants did not get appropriate advice about their diet during pregnancy.

Discussion

There were no enough studies of the same objective to this particular study. In addition, consideration of varying sets of covariates did not allow for straightforward comparison of result between the different studies, even, in countries abroad. In view of this limitation, the findings of this particular research discussed as follows:

The result showed that the overall culturally competence level of maternal health workers was 57.3 %, even if the rate was not uniform across different constructs of the subscales. Using the IAPCC-R continuum of care 9.1 % of them were culturally incompetent, one third (33.6 %) were aware, 47.3 % competent, and the rest 10 % were proficient. This result was much better than a study done in USA in which 23 % of the health workers were culturally competent [19]. Possible explanations for this discrepancy might be related to the fact that many immigrant women from every continent with more diverse population could be in USA and so had more variation in socio-cultural contexts.

Furthermore, the mean score for the IAPCC-R was 73 which fall within the “culturally aware” category in the IACCP-R continuum. Also, as one goes from awareness to encounter stage of the subscale, competence level of participants decreased from 19.4 to 3.3 %. This might imply that while people were relatively aware of the importance of culturally competent care, its implementation within or out of their profession and organization was very minimal. Nevertheless, it was promising that 54.4 % competence in the desire subscale means they did have the motivation to provide cultural competent care to their clients and would be one step to move to face the fact.

Literatures showed that clients taking part in the health care system are likely to look, think, and act,

| Table 3 The association of Socio demographic characteristics of maternal health care providers with cultural competence in Bahir Dar City Administration, 2012 (N = 274) |
|-------------------------------------------|------------------------|-------------------|---------------|
| Socio demographic characteristics               | Cultural competence | Crude OR (95 % CI) | AOR (95 % CI) |
|                                            | of competent | of incompetents |           |               |
| Type of health facility |                   |                   |           |               |
| Hospitals                      | 105       | 34     | 0.27(0.13,0.57) | 0.04     |
| Others                        | 124       | 11     | 1.00           | 0.37 [1.14, 97] |
| Place of birth                |                   |                   |           |               |
| Urban                         | 133       | 36     | 1.00           | 3.60(1.37, 9.40) |
| Rural                         | 96        | 9      | 2.89 (1.33,6.27) |          |
| Sex                           |                   |                   |           |               |
| Male                          | 76        | 33     | 1.00           | 3.65(1.56, 8.50) |
| Female                        | 153       | 12     | 5.54(2.71,11.33) |         |
| Age                           |                   |                   |           |               |
| 20–35 years                   | 184       | 37     | 1.00           | 1.96(64, 6.10) |
| >35 years                     | 45        | 8      | 1.13(0.49, 2.60) |          |
| Ethnicity                     |                   |                   |           |               |
| Amhara                        | 202       | 24     | 6.55(3.22,13.32) | 16.13(4.28,60.84) |
| Others                        | 27        | 21     | 1.00           |               |
| First language                |                   |                   |           |               |
| Amharic                       | 203       | 40     | 0.98 (3.52,2.70) | 0.24(0.05, 1.31) |
| Others                        | 26        | 5      | 1.00           |               |
| Profession                    |                   |                   |           |               |
| Midwives                      | 40        | 2      | 4.60(1.10, 19.56) | 5.10(74.35,17) |
| Others                        | 189       | 43     | 1.00           |               |
| In-service training related to maternal care |                   |                   |           |               |
| Yes                           | 92        | 36     | 5.96(2.74, 12.95) | 3.48(1.40,8.64) |
| No                            | 137       | 9      | 1.00           |               |
least in some ways, differently from the health care professional [20]. However, in our study 12.4 % of health care providers mentioned that client’s perception about health was no more different from them. This might probably be due to the fact that formal cultural competence education was not given for health workers in the country.

The finding revealed that only 34.3 and 38.0 % of health providers were aware of the importance of support from respected family members in the delivery room and clothing preference of women (personal vs. hospital gown) respectively. In addition, 21.2, 19.7, and 35.4 % of the health workers respectively were disagreed for allowing praying; to take hygienic care by women themselves or their families as per their desire; to allow sleeping in normal than delivery couch for women in labor. This was substantiated by mothers who were involved in the qualitative study expressing unhappiness that the health care providers did not understand their cultural needs. This was in line with other studies in which clients reported that their healthcare providers did not appreciate their religious or cultural needs [16, 21, 22].

Experts concerned providing client-centered health care on the basis of their interest as being able to see through the patient’s eyes [9]. However, in this study one third of maternal health workers were not comfortable in assisting delivery in any position other than the medically accustomed supine position and this was supported by complaint voiced by women for the supine position they were forced to deliver. The result is not in agreement with the need of women in Ethiopia. Traditionally women in Ethiopia prefer kneeling position for the reason that this position hastens delivery and makes delivery less painful [16]. In this regard lack of courtesy of health workers in women's position preference was identified as one of the barriers for institutional delivery that health workers should think over [16, 23, 24].

In our study 84 % of health providers preferred universal approach of management for all women seeking maternal services regardless of their residence, social economic status, religious background or worldview. However, a study done in Ghana indicated that as there are a range of practices imbedded in each culture, maternal care providers should never assume that all women are the same as this results in stereotyping [21]. The gap of our study with this fact might be related to lack of culturally tailored curriculum of health workers or lack of awareness of providers on the impact of culture on maternal health services.

Gender difference between the provider and the client can act as a barrier in the use of health services [21, 25]. About 63 % of health workers participated in this study agreed that being a male or female health care provider had no impact on the service utilization of women as far as the service was given. This was also supported by the result of qualitative part in which majority of study participants had no gender preference for the health care provider. This result is not in agreement with other studies conducted in Ethiopia and other parts of the world [22, 23, 26, 27] where women preferred to be seen by female care providers and stressed that having a female physician made them more comfortable, especially for gynecological matters. The gap might be attributed to small sample size in our study in relation to large scale studies at region or country level in other studies.

The major predictors identified for cultural competence in the logistic regression model were: the organization type in which health professionals work, birth place, gender, and in-service training.

Health care providers working in hospital were 63 % less likely to be culturally competent compared to those who worked in other health care facilities [AOR 0.37; 95 % CI: 0.14, 0.97] and the association was also significant [p = 0.03]. This could be explained by the fact that hospital workers usually gave service for referred cases that came out of their catchments and probably women from societies of diverse ethnic groups, language, and cultures in comparison to health centers and clinics that serve communities with their nearby surroundings that they are familiar.

Healthcare providers who were born in rural area were 3.7 [95 % CI: 1.37, 9.40] times more likely to be culturally competent compared to their urban counterparts. This might be related to the fact that rural community retain and continue their ancestor distinct traditional practices than urban dwellers in which the latter have been more likely to adopt the western cultural habits and customs as they are more liable to be influenced by media, technology and other aspects of globalization.

Female health workers were 3.65 times, [95 % CI: 1.56, 8.50] more likely to be culturally competent compared to men. The association was also strongly significant [p = 0.005]. Like other parts of Ethiopia in the study area too, most of traditional practices were expected to be practiced by and/or practiced on women for whom females might probably got to share or at least observed cultural practices in their families and neighbors.

Health care providers who got in-service training related to maternal care were 3.5 times (95 % CI 1.40, 8.64) more likely to be competent than those who did not get the training [p = 0.007]. This might indicate that competence could be brought by training of health workers as they might get chance of acquisition of up-to-date information from specifically designed maternal care services.
However, in the present study there was no significant relationship between general cultural competences and the level of academic credentials.

**Strength and weakness**

The study tried to investigate common but unforeseen barrier of health seeking for maternal healthcare.

As limitation there could be a possibility of social desirability bias. Also, since there were no enough studies of the same objective to this particular study, there were no appropriate comparisons. In addition Consideration of varying sets of covariates did not allow for straightforward comparison of result between the different studies, even, with the results of countries abroad.

**Conclusion**

The overall competence level of maternal health workers was low and on average the level falls in Cultural awareness stage, second stage, indicated that health workers consider this issue important but it requires them to become culturally competent and culturally proficient.

The voices of mothers in the qualitative assessment also showed that they were dissatisfied for the services they got and the interactions they had with health care providers. Mothers, especially after delivery, also mentioned that they were inhibited from activities that could be freely practiced if they were at their homes.

Organization type, birth place, Gender, and in-service training were among major predictors identified for cultural competence. Working other than hospital, grew in rural community, being Amhara and those maternal health workers who got in service training respectively were more competent than their counterparts.

These results have national implications for considering client’s varying degrees of religious, ethnic and other cultural adherences in maternal services. The findings of this study will also encourage continuing research, education, and culturally sensitive interventions as part of the health worker’s mission to provide holistic care.

Hence, we recommend in designing culture based trainings or curriculum based education for maternal health workers and to undertake community assessment to identify common cultural practices and shape services accordingly. Finally, heterogeneous ethnic backgrounds and cultures found in the Ethiopian population, future large scale studies on health providers’ cultural competence toward various cultural groups is forwarded.

**Competing interests**

The authors declare that they have no conflict of interests.

**Authors’ contributions**

AA: wrote the proposal, participated in data collection, analyzed the data and drafted the paper. TY: approved the proposal with some revisions, participated analysis and manuscript writing and enriched the data. DT: approved the proposal with some revisions and analysis. WG: participated in data collection and manuscript editing. All authors read and approved the final manuscript.

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CHAPTER 6

Satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector: national comparative cross-sectional study

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Title: Satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector: a national comparative cross-sectional study

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Abstract

Background: Enhancing the motivation and retention of health workers is a global policy priority. We aimed to assess and compare satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public sector.

Methods: A national cross-sectional study was conducted with physicians and associate clinicians (ACs) providing healthcare services in public facilities. A two-stage stratified cluster sampling method was used to randomly select health facilities and health workers from each of the 11 regions and city administrations. Data were collected in 2014 using face-to-face interview. Likert-type items were used to assess satisfaction with job and working and living conditions as well as perceived importance of factors in deciding to stay or leave. Participants were also asked about intention to leave their facility within a year. Logistic regression analysis was done to identify predictors.

Results: A total of 375 physicians and 127 ACs from all regions of Ethiopia participated in the study. Only 39.2% of physicians and 48.8% of ACs were satisfied with their job. Moreover, 47.5% of physicians and a significantly higher percent of ACs (61.4%) planned to leave their job in one year. On a scale of 1 to 5, mean motivation score was 3.05 for physicians and 3.02 for ACs. Satisfaction and motivation did not significantly differ between the two groups. Over 85% of respondents rated salary, as well as allowances for duty, professional risk, and housing, highly important to stay in a facility. Low pay, poor access to higher education, and limited opportunities for promotion topped the reasons for a decision to leave. Multivariable logistic regression analysis for job satisfaction found that a 10% increase in satisfaction score with salary and benefit, management and work climate, and recognition and appreciation was each associated with nearly 50%, 40% and 30% improvement in likelihood of job satisfaction, respectively. Multivariable analysis for intention to leave showed that unsatisfied respondents were twice more likely to plan to leave.
Conclusions: Our findings suggest that low satisfaction, motivation, and stability of physicians and associate clinicians is a serious health system challenge in Ethiopia requiring urgent policy action.

Key words: satisfaction, motivation, retention, physician, health officer, Ethiopia
Background

The importance of investment in the health workforce to attain health development goals has been recognized for some time now [1-3]. This got new emphasis with inclusion of health workforce in the sustainable development goals (SDGs) [4], development of a global human resources for health strategy [5], and establishment of a United Nation high-level commission for health employment and economic growth [6]. Ethiopia’s health sector transformation plan, which is aligned with the SDGs, has also placed emphasis on strengthening the health workforce. One of the transformation agendas focus on developing compassionate, respectful and caring health workers, and another aims to ensure quality and equity in healthcare [7].

Physicians are a vital component of the health workforce agenda, as they play a critical role in delivering essential healthcare services. Density, distribution and quality of doctors has an effect on health outcomes [2, 3, 8]. Doctors, along with nurses and midwives, are the basis for establishing minimum workforce density thresholds to attain global health development goals [2, 5]. Associate clinicians (ACs), a professional cadre doing many of the tasks of physicians [9, 10], also deliver as effective healthcare services as doctors playing a critical role in primary health care especially in settings with shortage of physicians [11]. ACs (also known as non-physician clinicians in the literature) have different names in different countries and are better known by the name “health officer” in Ethiopia. Ethiopia’s ACs receive four years of university education and are deployed in rural health facilities to provide primary health care, while doctors are trained for six years and deployed mainly in hospitals. Due to massive expansion of pre-service education, the current number of 5,411 physicians and 9,746 ACs in Ethiopia’s public health sector is expected to increase by 5- and 2-folds, respectively, in the coming ten years [12].

Improving satisfaction, motivation and retention of health workers is an important policy priority in Ethiopia [12] and globally [3, 5]. Unsatisfied and unmotivated health workers are less likely to provide
safe and quality care, satisfy their clients, and stay in their current job [13-17]. Lower job satisfaction can also lead to burnout, lower productivity, and mental health problems [14, 18]. High turnover hurts accessibility and quality of health services, results in loss of institutional memory, and incurs huge cost to health systems [16, 19-21].

A desk review of health worker satisfaction, motivation and retention studies in 2013/2014 found some published studies from Ethiopia [22-33]. Although these studies highlighted the presence of considerable challenges, they were limited by their geographic coverage and barely included physicians and associate clinicians in practice. Comparative studies between different health cadres were also lacking. Accordingly, the objectives of this study were to assess and compare satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector and identify influencing factors.

**Methods**

A national cross sectional study was conducted from 28 May to 14 June, 2014 covering the 9 regional states and 2 city administrations of Ethiopia. Ethiopia has a federal government with nine regions and two city administrations: four are large and mostly agrarian, three are largely urban, and four are least developed accounting for 86%, 4.4% and 9.5% of the population, respectively [34]. Although the study involved multiple categories of healthcare providers working in 227 health facilities, this manuscript focuses on physicians and associate clinicians.

Physician sample size was calculated to be 432, considering 95% level of confidence, 50% prevalence of satisfaction and turnover intention, 10% margin of error, 1.2 design effect [35], 10% anticipated non-response rate, and a population of 2,668 physicians in the public sector in 2013. Assuming a sample of four doctors per facility is optimum for a study [35], 108 hospitals were required to achieve the sample size. Since ACs primarily worked in health centers, we recruited available ACs from 125 health centers,
which were sampled as part of multi-cadre satisfaction and retention study. The sample government health facilities were allocated proportionally to each region. To obtain a nationally representative data, a two-stage stratified cluster sampling strategy was used to select health facilities in the first step and health workers in the second step. The eleven regions and city administrations were considered as strata and the 122 hospitals and 2,660 health centers as clusters. Health facilities were selected by simple random sampling in each region/city administration. Subsequently, data collectors received lists of available physicians and ACs from each facility and selected them randomly. Physicians and ACs who had been full time employees at least for 6 months in the facility were eligible for the survey.

Data were collected using face-to-face interview. Satisfaction with current job and working and living conditions was measured using 38 Likert scale questions. The response options were strongly disagree=1, disagree=2, neutral=3, agree=4, and strongly agree=5. Turnover intention (instability) was measured by asking respondents if they were planning to leave their job in the next one year (yes=1, no=0). Study participants were also asked to rate the importance of eight compensation and benefits employers may give in their decision to stay in the job. They were also asked to rate the importance of 20 factors in influencing their decision to leave their job. Importance was rated on a 5-point scale (not important=1, somewhat important=2, important=3, very important=4, and extremely important=5). Data collectors were trained and supervised during fieldwork.

Data were analyzed in SPSS 24. Descriptive analysis was carried out to determine levels of satisfaction, motivation and turnover intention. Five-point Likert-type agreement response options were dichotomized, whereby “strongly disagree”, “disagree” and “neutral” were categorized as “unsatisfied” while “agree” and “strongly agree” were categorized as “satisfied”. Similarly, 5-point importance response options were reduced to three, combining “extremely important” and “very important” as “highly important” and merging “not important” and “somewhat important” as “not important”. Average results of the 35 out of 38 satisfaction items were summarized thematically based on the
motivation and retention literature [36]: self-efficacy index (2 items), work burden index (2 items), compensation and benefits index (3 items), management and work climate index (12 items), recognition and appreciation index (3 items), infrastructure and resources index (7 items), and living conditions index (6 items) (See supplementary material for thematic organization of items). Motivation score was also determined by calculating the mean of the 38 items about job and working and living conditions, whereby a score between 1 and 3 was interpreted as “low motivation” and between 4 and 5 as “high motivation”. Furthermore, chi-square and t-tests were done to detect statistically significant differences between physicians and associate clinicians. Multivariable logistic regression analysis was performed to identify predictors of satisfaction and turnover intention. Percent scores were computed for thematic areas entered into logistic regression analysis as independent variables. All variables with p<=0.25 in binary analysis were included in backward elimination multivariable logistic regression analysis.

Results

Socio-demographic data

A total of 502 respondents including 375 physicians from 107 hospitals (86.8% response rate) and 127 associate clinicians from 119 health centers and 8 hospitals participated in the study. The mean age of study participants was 28.5 years (28.3 for physicians and 29.2 for associate clinicians). The largest proportions of study participants were males (75.1%), single (67.9%), urban origin (63.7%), and with undergraduate qualification (90%). Most (81.2%) worked in the four large regions while 8.8% were from the least developed regions. A majority of respondents had five years or less service in the current facility (86.8%), were under compulsory service requirement (74.3%), and lived in a house provided by the facility (54%). (Table 1)

Satisfaction and motivation status
Figures 1 and 2 present physicians’ and associate clinicians’ satisfaction with their job and working and living conditions, respectively. A majority of physicians and associate clinicians (ACs) rated factors related to their job, work environment and living conditions unfavorably. Considering everything, only 39.2% of physicians and 48.8% of ACs were satisfied with their job. The trend of more satisfaction by associate clinicians was, however, not statistically significant (Chi-Square=3.61, P=0.06). Motivation score yielded similar results between the cadres (3.05 for physicians and 3.02 for ACs, P=0.7). For physicians, the highest satisfaction derived from relationship with co-workers (91.4%), sense of belongingness to the community (87.5%), and being valued by the community (82.9%), while the lowest satisfaction was reported for salary (8.8%), internet connectivity at work (12.2%), and shopping and entertainment amenities in the community (16.2%). ACs reported similar results except that fairness of benefit replaced salary as a cause of lowest satisfaction (7.1%).

When we examined responses thematically, a majority of physicians were satisfied with their work burden (68.7%), recognition and appreciation from their organization and community (54.5%), and self-efficacy to do their job well (54%), but satisfaction rates were lower with compensation and benefits (17.6%), infrastructure and resources (39.9%), living conditions (47%), and management and work climate in their facility (48.8%). Similarly, a majority of ACs were satisfied with their work burden (68.5%), recognition and appreciation (60.1%), and management and work climate (54.4%), while lower rates were reported for compensation and benefits (17.1%), infrastructure and resources (42.9%), living conditions (43.8%), and self-efficacy (44.9%). (Data provided in the supplementary material).

**Importance of compensation and benefits**

Figure 3 summarizes respondents’ perception of importance of compensation and benefits for a decision to stay in the job. Vast majority of respondents said the different compensation and benefits employers may offer were all highly important to stay committed to their facility. The most popular
benefits were salary, and allowances for duty, professional risk, and housing, which were all rated highly important by over 85% of respondents.

**Importance of factors that affect the decision to leave**

Figure 4 presents respondents’ perception of importance of factors for a decision to leave their job. Overall, physicians and ACs said a majority of the twenty factors were highly important for a decision to leave their job. Low pay, poor access to higher education, and limited opportunities for promotion were the top three factors. In relative terms, supply and equipment constraints seemed to matter more to physicians, while ACs were more concerned about high cost of living.

**Intention to leave**

About half (47.5%) of physicians and a higher percent of ACs (61.4%) were planning to leave their job within one year (Chi-square= 7.25, p-value=0.007). The most frequent reasons provided by physicians were related to compensation and benefits (52.8%), professional development (44.9%), living conditions (42.1%), management and work climate (25.8%), and infrastructure and resources (15.2%). ACs provided the same reasons but living conditions moved up to the second place.

**Predictors of job satisfaction**

Table 2 summarizes the results of multivariable logistic regression analysis with “job satisfaction” as dependent variable. Of the twenty independent variables considered for logistic regression, marital status, having children or dependents, duration of obligation, living house ownership status yielded p-values >0.25 in the binary logistic regression analysis and were excluded. A backward elimination multivariable logistic regression analysis retained ten variables and six of them were statistically significant. A ten percent increase in satisfaction score with salary and benefit was associated with about 50% increase in the likelihood of job satisfaction (aOR=1.05, 95% CI=1.03-1.06). A similar increase
in management and work climate was associated with 40% improvement in the odds of satisfaction (aOR=1.04, 95% CI=1.01-1.06). A ten percent increase in recognition and appreciation was also associated with 30% increase in the chances of satisfaction (aOR=1.03, 95% CI=1.01-1.05). Respondents born in rural areas were about two times more likely to be satisfied with their job (aOR=1.93, 95% CI=1.19-3.12). Those working in the large agrarian and urban regions had 74% (aOR=0.26, 95% CI=0.12-0.56) and 71% (aOR=0.29, 95% CI=0.10-0.84) less chance of being satisfied than those working in the least developed regions, respectively. Duration of service was positively associated with job satisfaction (aOR=1.12, 95% CI=1.02-1.23). Although perceptions of quality of care, self-efficacy, work burden, infrastructure and resources, and living conditions, were significantly associated with satisfaction in the binary analysis, the relationships did not hold in the multivariable analysis. However, when a multivariable analysis was fitted separately for physicians, self-efficacy significantly predicted job satisfaction (aOR=1.02, 95% CI=1.00-1.04) (Data not shown).

Predictors of turnover intention

Table 3 summarizes the results of multivariable logistic regression analysis with “intention to leave” as dependent variable. Of the twenty two candidate variables in the binary logistic regression, marital status, place of birth, living house ownership status, having obligation, and duration of obligation had p-values > 0.25 and were dropped. A backward elimination multivariable analysis further removed nine variables and demonstrated that sex, age, facility level, duration of obligation, and overall job satisfaction were associated with plan to leave. The strongest association was found between overall job satisfaction and turnover intention. Unsatisfied respondents were twice more likely to plan to quit (aOR=2.06, 95% CI=1.32, 3.22). Female respondents were also 60% more likely to intend to leave than males (aOR=1.60, 95% CI=1.001-2.56). Age was negatively associated with turnover plan, likelihood of leaving decreasing with age (aOR=0.95, 95% CI=0.92-0.99). Respondents working in referral hospitals were 73% (aOR=0.27, 95% CI=0.14-0.53) less likely to plan to quit than those in primary hospitals. Study
participants with 2 years or longer obligation were 44% (aOR=0.56, 95% CI=0.37-0.85) less likely to plan to leave. Cadre type, region of work, and satisfaction with specific facets of job and working and living conditions were significantly associated with turnover intention in the binary but not multivariable logistic regression analysis. A separate multivariable analysis model for physicians, however, showed respondents in urban regions had a significantly lower turnover intention than those in the least developed regions (aOR=0.27, 95% CI=0.08-0.87, p=0.03) (Data not shown)

Discussion

Our findings clearly indicate that satisfaction, motivation and stability of physicians and ACs is a serious challenge to Ethiopia’s health system. A majority of physicians and ACs are not satisfied; their motivation is low; and about half intend to leave their facility in the next one year. Even if the intention to leave does not materialize, many will likely be reluctant stayers with poor motivation and performance [37-39]. While physicians and ACs are unhappy with a broad range of factors related to their job and working and living conditions, our findings demonstrated that salary and benefits, facility management and work climate, and recognition and appreciation are the most important determinants of overall job satisfaction. It is also important to note that respondents highly value not only salary but also allowances for duty, professional risk, and housing, possibly because they represent a significant source of supplemental income. Our study also showed that job dissatisfaction had the largest influence on the likelihood of turnover intention. Moreover, low pay, poor access to higher education and limited opportunities for promotion were reported as very important considerations in deciding to leave. Disenchantment with compensation and benefits, professional development opportunities, living conditions, management and work climate, and infrastructure and resources were frequently mentioned reasons by those planning to leave. However, displeasure with a single factor did not independently influence turnover intention. This possibly imply that a decision to leave is a result of collective dissatisfaction from a variety of factors.
Although associate clinicians had a somewhat higher satisfaction level and a significantly higher turnover intention than physicians in the descriptive analysis, professional category lost its significance as a predictor of satisfaction and turnover intention when effects of confounders were accounted for.

The magnitude of the problems found in our study are largely consistent with other studies from Ethiopia. While limited in geographic scope, inclusion of physicians and associate clinicians, and/or their sample size, several studies from Ethiopia have reported one-third to three-quarters of health workers were not satisfied or had sub-optimal satisfaction [22, 24-27, 29-31, 40-44]. We came across only one study which reported a higher prevalence (79.5%) of satisfaction [45]. Satisfaction tends to be consistently lowest for salary and benefits. This would not come as a surprise, as public sector workers in Ethiopia earn much less compared to the private sector [46]. Studies from Ethiopia have also reported high level of intended and actual turnover. A cohort study found that about 60% of doctors and nurses quit their first job within two years, doctors citing salary dissatisfaction as the main reason [29, 34]. Retrospective studies reported six year physician attrition rates of 24% [47] and 47.2% [23] and high turnover rate of medical faculty [32]. Cross-sectional studies reported 26.7% of physicians [22] and half of nurses [26, 48] were planning to leave their facility in the coming one year. Studies of doctors [29] and medical students [33] reported more than half of the respondents were planning to emigrate, with dissatisfaction increasing the odds of leaving. Another study also reported that only 39.8% of nurses intended to stay in their profession [28] while a study of pharmacy professionals reported only 33.3% wanted to stay in the current facility [25].

Our results are also generally in agreement with most reports from other low and middle income countries, which have found varying but substantial levels of dissatisfaction (29% to 58.6%) and turnover intentions (26.5% to 69%) [49-59]. For example, a critical incident analysis interview with mid-level providers in Malawi found that 69% had experienced a demotivating incident in the previous three
months that made them seriously consider leaving [53]. However, a study reported relatively lower dissatisfaction (17.4%) and turnover intention (18.8%) rates in Tanzania [49].

The modifiable factors influencing satisfaction and turnover intention in our study are widely supported by literature reviews [16, 17, 36, 60-64]. While the evidence base is still developing, literature reviews also indicate that integrated, contextually appropriate, and evaluated financial and non-financial incentives are likely to satisfy, motivate, and retain health workers [65-70].

Our study also has other notable findings. Rural background, longer service years, and working in the least developed regions were positively associated with satisfaction. Physicians who were more confident about their competence were also more likely to be satisfied. Female sex, younger age, working in primary hospital, and approaching the end of one's obligation time for service raised the odds of wanting to leave. Evidence from literature reviews [69, 71] and two Ethiopian studies [33, 45] showed that health workers from a rural background are more likely to be attracted to rural practice. This may provide an indirect support to our finding of a positive association between rural upbringing and job satisfaction owing to a more intrinsic motivation to serve.

The positive association between length of service and satisfaction coupled with the negative association between age and turnover intention suggest younger and early career health workers are at higher risk of dissatisfaction and attrition. Although females reported somewhat higher satisfaction, they were more likely to intend to leave. These findings might indicate the need for motivation and retention strategies to pay attention to young, early career and female health workers. However, the influence of sex and age on satisfaction, motivation and retention is unclear. A nursing literature review found an inverse relationship between age and turnover intention possibly because younger health workers want further education and have more employment opportunities [20]. In contrast, a review of
causes of physician turnover did not find consistent associations with individual characteristics like age and sex. Ethiopian studies have also produced mixed results [23, 24, 26, 29, 33, 40-43, 45, 47].

Our findings about region and level of facility reflect the well-known challenge of attracting and retaining health workers in remote and rural areas [3, 12, 27, 29, 69, 72]. In our study, the level of turnover intention was much higher in the large agrarian regions (where most of the Ethiopian population live) and the least developed regions (which have historically been underserved). Intent to leave was also much higher among respondents working in primary hospitals and health centers (which are often located in rural areas and smaller towns) compared to those in higher level hospitals. Moreover, working in primary hospitals increased the chances of planning to leave. Respondents working in the least developed regions also had a higher odds of leaving, when the analysis was done for physicians only. Previous studies from Ethiopia have also documented significant rural to urban mobility [29] and higher attrition from district hospitals towards the capital city [47]. A positive finding in our study is that respondents working in the historically disadvantaged regions achieved greater satisfaction. This may be indicative of health workers deriving greater moral satisfaction from serving in underserved areas. Those places may also provide more incentives to motivate health workers. However, these do not seem enough for retention. There is a concern in the literature that remote and rural places serve as professional practice areas and health workers move to urban areas once they have honed their skills [60]. Hence, without more efforts on retention, it will be difficult to redress the already unbalanced distribution of health workers in Ethiopia [12, 27].

Compulsory service programs are implemented by many countries to improve distribution and retention of health workers [73]. In our study, respondents with longer obligation time remaining were not contemplating to leave suggesting that the compulsory service is working to retain them at least for the short term. However, the increased likelihood of departure as respondents get closer to finishing their
commitment warrants developing long lasting retention strategies. Turnover after fulfilling obligation is a common weakness of compulsory service programs [73].

**Strengths and limitations**

The fact that our study has a national coverage makes the findings more valid; however, the sample size for associate clinicians was relatively smaller. We also would like to acknowledge that the cross-sectional study design does not allow to establish a cause and effect relationship.

**Conclusions**

Given the magnitude of dissatisfaction we found in our study and the global call to optimize satisfaction, motivation and retention of health workers[5], Ethiopia’s policy makers and health leaders should recognize that low satisfaction, motivation, and stability of physicians and associate clinicians is a critical health system challenge. Ethiopia’s aspirations to attain the health targets of SDGs, improve quality and equity of healthcare, and ensure compassionate, respectful and caring workforce will be advanced by tackling factors negatively affecting satisfaction, motivation and retention of physicians and ACs.

While we recognize that motivation and retention strategies should be comprehensive to address the broad range of factors frustrating physicians and ACs, highest priority should be placed on improving compensation and benefit, management and work climate, and recognition and appreciation. Compensation and benefits should be reviewed to enable decent living. The existing postgraduate training programs in hospital management and human resources for health management are a good opportunity to develop health leaders, who can transform facility and human resources management. These leaders, however, should be supported to improve actual management practices. It is also important to regularly evaluate effectiveness of motivation and retention strategies through research and workforce data.
List of abbreviations

ACs: Associate Clinicians

CI: Confidence Interval

HO: Health Officer

NA: Not applicable

aOR: Adjusted odds ratio

Ref: Reference group

SDGs: Sustainable Development Goals

Declarations

Ethics approval and consent to participate

Ethical clearance was secured from Johns Hopkins University Institutional Review Board (IRB) and the Federal Democratic Republic of Ethiopia Ministry of Health approved the study. Informed verbal consent was also obtained from all respondents. A trained interviewer discussed elements of the consent form, answered questions study participants may have, and secured oral consent. We sought and obtained a waiver of signed consent from the IRB since our study posed minimal risk and did not involve patients.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.
Competing interests

The authors declare that they have no competing interests.

Funding source

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Authors’ contributions

TY led the design of the study and writing of the manuscript. GT analyzed the data and was a major contributor to the writing of the manuscript. JVR, JS, YMK, and EY critically reviewed the manuscript and provided major inputs. SS and DW provided major inputs to the design and development of the manuscript.

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### Table 1: Socio-demographic characteristics of study participants, Ethiopia, 2014 (n=502)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Physicians (n=375)</th>
<th>Health officers (n=127)</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td>Number (%)</td>
</tr>
<tr>
<td>Facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Primary hospital</td>
<td>89 (23.7%)</td>
<td>1 (0.8%)</td>
<td>90 (17.9%)</td>
</tr>
<tr>
<td>• General hospital</td>
<td>186 (49.6%)</td>
<td>6 (4.7%)</td>
<td>192 (38.2%)</td>
</tr>
<tr>
<td>• Referral hospital</td>
<td>100 (26.7%)</td>
<td>1 (0.8%)</td>
<td>101 (20.1%)</td>
</tr>
<tr>
<td>• Health center</td>
<td>0</td>
<td>119 (93.7%)</td>
<td>119 (23.7%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male</td>
<td>299 (79.7%)</td>
<td>76 (20.3%)</td>
<td>377 (75.1%)</td>
</tr>
<tr>
<td>• Female</td>
<td>76 (20.3%)</td>
<td>78 (61.4%)</td>
<td>125 (24.9%)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Single</td>
<td>270 (72.0%)</td>
<td>71 (55.9%)</td>
<td>341 (67.9%)</td>
</tr>
<tr>
<td>• Married</td>
<td>103 (27.5%)</td>
<td>55 (43.3%)</td>
<td>158 (31.5%)</td>
</tr>
<tr>
<td>• Divorced/separated</td>
<td>2 (0.5%)</td>
<td>1 (0.8%)</td>
<td>3 (0.6%)</td>
</tr>
<tr>
<td>Place of birth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Urban</td>
<td>248 (66.1%)</td>
<td>72 (56.7%)</td>
<td>320 (63.7%)</td>
</tr>
<tr>
<td>• Rural</td>
<td>127 (33.9%)</td>
<td>55 (43.3%)</td>
<td>182 (36.3%)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Agrarian</td>
<td>302 (80.5%)</td>
<td>106 (83.5%)</td>
<td>408 (81.2%)</td>
</tr>
<tr>
<td>• Urban</td>
<td>41 (10.9%)</td>
<td>9 (7.1%)</td>
<td>50 (10.0%)</td>
</tr>
<tr>
<td>• Least developed</td>
<td>32 (8.5%)</td>
<td>12 (9.4%)</td>
<td>44 (8.8%)</td>
</tr>
<tr>
<td>Stay in current facility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 5 years and less</td>
<td>337 (89.9%)</td>
<td>99 (78.0%)</td>
<td>436 (86.8%)</td>
</tr>
<tr>
<td>• 6-15 years</td>
<td>27 (7.2%)</td>
<td>19 (15.0%)</td>
<td>46 (9.2%)</td>
</tr>
<tr>
<td>• 16 years and above</td>
<td>11 (2.9%)</td>
<td>9 (7.0%)</td>
<td>20 (4.0%)</td>
</tr>
<tr>
<td>Under obligation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Yes</td>
<td>311 (82.9%)</td>
<td>62 (48.8%)</td>
<td>373 (74.3%)</td>
</tr>
<tr>
<td>• No</td>
<td>64 (17.1%)</td>
<td>65 (51.2%)</td>
<td>129 (25.7%)</td>
</tr>
<tr>
<td>Residential house</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Own</td>
<td>14 (3.7%)</td>
<td>16 (12.6%)</td>
<td>30 (6.0%)</td>
</tr>
<tr>
<td>• Provided by facility</td>
<td>256 (68.3%)</td>
<td>15 (11.8%)</td>
<td>271 (54.0%)</td>
</tr>
<tr>
<td>• Rented</td>
<td>95 (25.3%)</td>
<td>90 (70.8%)</td>
<td>185 (36.8%)</td>
</tr>
<tr>
<td>• Live with parents</td>
<td>10 (2.7%)</td>
<td>6 (4.7%)</td>
<td>16 (3.2%)</td>
</tr>
</tbody>
</table>

*Note: In Ethiopia, associate clinicians (ACs) are known as health officers. Eight health officers working in nearby hospitals were invited as replacement when sampled health centers did not have one.*
Table 2: Predictors of overall job satisfaction of physicians and health officers in Ethiopia’s public sector, 2014

<table>
<thead>
<tr>
<th>Variable</th>
<th>% satisfied</th>
<th>Crude odds ratio (95% CI)</th>
<th>Adjusted odds ratio (AOR) (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>AOR (95% CI)</td>
<td></td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>39.2%</td>
<td>1.48 (0.987-2.218)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Health officer</td>
<td>48.8%</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>39.5%</td>
<td>Ref.</td>
<td>1.41 (0.940-2.122)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48.0%</td>
<td></td>
<td>1.47 (0.853-2.513)</td>
<td>0.166</td>
</tr>
<tr>
<td>Age</td>
<td>NA</td>
<td>1.02 (0.994, 1.051)</td>
<td>0.92 (0.842-1.003)</td>
<td>0.057</td>
</tr>
<tr>
<td>Type of facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary/district hospital</td>
<td>36.4%</td>
<td>Ref.</td>
<td>1.29 (0.810-2.068)</td>
<td>-</td>
</tr>
<tr>
<td>General hospital</td>
<td>42.9%</td>
<td></td>
<td>1.07 (0.613-1.854)</td>
<td></td>
</tr>
<tr>
<td>Referral hospital</td>
<td>37.9%</td>
<td></td>
<td>1.69 (1.027-2.773)</td>
<td></td>
</tr>
<tr>
<td>Health center</td>
<td>48.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>38.4%</td>
<td>1.44 (0.993-2.073)</td>
<td>1.93 (1.193-3.124)</td>
<td>0.007</td>
</tr>
<tr>
<td>Rural</td>
<td>47.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Region of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least developed</td>
<td>61.4%</td>
<td>Ref.</td>
<td>0.43 (0.226-0.809)</td>
<td></td>
</tr>
<tr>
<td>Agrarian</td>
<td>40.4%</td>
<td></td>
<td>0.26 (0.117-0.556)</td>
<td>0.001</td>
</tr>
<tr>
<td>Urban</td>
<td>34%</td>
<td></td>
<td>0.32 (0.140-0.754)</td>
<td>0.023</td>
</tr>
<tr>
<td>Duration of service</td>
<td>NA</td>
<td>1.04 (1.005-1.068)</td>
<td>1.12 (1.020-1.226)</td>
<td>0.017</td>
</tr>
<tr>
<td>Have current obligation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>39.1%</td>
<td>1.48 (0.992-2.221)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No</td>
<td>48.8%</td>
<td></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Would encourage my family and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>friends to seek care here</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>56.4%</td>
<td>Ref</td>
<td>0.33 (0.231-0.483)</td>
<td></td>
</tr>
<tr>
<td>Not agree</td>
<td>30.1%</td>
<td></td>
<td>0.69 (0.429-1.111)</td>
<td>0.127</td>
</tr>
<tr>
<td>Self-efficacy index</td>
<td>NA</td>
<td>1.04 (1.027-1.050)</td>
<td>1.01 (0.998-1.028)</td>
<td>0.090</td>
</tr>
<tr>
<td>Work burden index</td>
<td>NA</td>
<td>1.02 (1.011-1.033)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Salary &amp; benefit index</td>
<td>NA</td>
<td>1.06 (1.045-1.072)</td>
<td>1.05 (1.030-1.062)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Management &amp; work climate index</td>
<td>NA</td>
<td>1.08 (1.065-1.103)</td>
<td>1.04 (1.012-1.064)</td>
<td>0.004</td>
</tr>
<tr>
<td>Recognition &amp; appreciation index</td>
<td>NA</td>
<td>1.07 (1.050-1.080)</td>
<td>1.03 (1.007-1.047)</td>
<td>0.009</td>
</tr>
<tr>
<td>Infrastructure &amp; resource index</td>
<td>NA</td>
<td>1.04 (1.027-1.055)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Living conditions index</td>
<td>NA</td>
<td>1.03 (1.019-1.046)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: In Ethiopia, associate clinicians (ACs) are known as health officers.

CI=confidence interval; Ref= Reference group; NA=Not applicable
Table 3: Predictors of turnover intention of physicians and health officers in Ethiopia’s public sector, 2014

<table>
<thead>
<tr>
<th>Variable</th>
<th>Turnover intention in a year (%)</th>
<th>Crude odds ratio (95% CI)</th>
<th>Adjusted odds ratio (AOR) (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profession</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>47.6%</td>
<td>Ref</td>
<td>1.75 (1.162-2.644)</td>
<td></td>
</tr>
<tr>
<td>Health officer</td>
<td>61.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48.7%</td>
<td>Ref</td>
<td>1.48 (0.983-2.229)</td>
<td>0.049</td>
</tr>
<tr>
<td>Female</td>
<td>58.4%</td>
<td></td>
<td>1.60 (1.001-2.562)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.95 (0.921-0.979)</td>
<td></td>
<td>0.95 (0.916-0.988)</td>
<td>0.009</td>
</tr>
<tr>
<td>Have children or dependents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>48.5%</td>
<td>Ref</td>
<td>1.34 (0.991-1.944)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>56.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary/district hospital</td>
<td>61.2%</td>
<td>Ref</td>
<td>0.55 (0.342-0.866)</td>
<td>0.326</td>
</tr>
<tr>
<td>General hospital</td>
<td>46.2%</td>
<td></td>
<td>0.76 (0.433-1.321)</td>
<td></td>
</tr>
<tr>
<td>Referral hospital</td>
<td>27.6%</td>
<td></td>
<td>0.27 (0.136-0.529)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health center</td>
<td>63.0%</td>
<td></td>
<td>1.37 (0.731-2.550)</td>
<td>0.328</td>
</tr>
<tr>
<td>Region of work</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least developed</td>
<td>52.3%</td>
<td>Ref</td>
<td>1.03 (0.554-1.925)</td>
<td></td>
</tr>
<tr>
<td>Agrarian</td>
<td>53.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>34%</td>
<td></td>
<td>0.47 (0.205-1.081)</td>
<td></td>
</tr>
<tr>
<td>Duration of service</td>
<td>NA</td>
<td></td>
<td>0.96 (0.932-0.992)</td>
<td></td>
</tr>
<tr>
<td>Remaining obligation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2 years</td>
<td>55.6%</td>
<td>Ref</td>
<td>0.69 (0.484-0.979)</td>
<td>0.006</td>
</tr>
<tr>
<td>&gt;=2 years</td>
<td>46.3%</td>
<td></td>
<td>0.56 (0.365-0.848)</td>
<td></td>
</tr>
<tr>
<td>Would encourage my friends and family to seek care here</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>39.5%</td>
<td>Ref</td>
<td>2.31 (1.608-3.308)</td>
<td>0.104</td>
</tr>
<tr>
<td>Not agree</td>
<td>60.1%</td>
<td></td>
<td>1.44 (0.928-2.236)</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy index</td>
<td>NA</td>
<td></td>
<td>0.98 (0.965-0.985)</td>
<td></td>
</tr>
<tr>
<td>Work burden index</td>
<td>NA</td>
<td></td>
<td>0.99 (0.978-0.998)</td>
<td>0.131</td>
</tr>
<tr>
<td>Salary &amp; benefit index</td>
<td>NA</td>
<td></td>
<td>0.98 (0.967-0.987)</td>
<td></td>
</tr>
<tr>
<td>Management &amp; work climate index</td>
<td>NA</td>
<td></td>
<td>0.99 (0.962-1.003)</td>
<td>0.096</td>
</tr>
<tr>
<td>Recognition &amp; appreciation index</td>
<td>NA</td>
<td></td>
<td>0.97 (0.960-0.982)</td>
<td>0.119</td>
</tr>
<tr>
<td>Infrastructure &amp; resource index</td>
<td>NA</td>
<td></td>
<td>0.99 (0.970-1.003)</td>
<td></td>
</tr>
<tr>
<td>Living conditions index</td>
<td>NA</td>
<td></td>
<td>0.97 (0.962-0.986)</td>
<td></td>
</tr>
<tr>
<td>Overall job satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>37%</td>
<td>Ref</td>
<td>2.67 (1.852-3.854)</td>
<td>0.001</td>
</tr>
<tr>
<td>Not agree</td>
<td>61.1%</td>
<td></td>
<td>2.06 (1.321, 3.216)</td>
<td></td>
</tr>
</tbody>
</table>

Note: In Ethiopia, associate clinicians (ACs) are known as health officers.

Cl=confidence interval; Ref= Reference group; NA=Not applicable
Figure 1: Physicians satisfaction with their job, and working and living conditions

- Overall the morale level in my team is good
- My supervisor applies personnel policies fairly to me
- Am not worried about losing my job
- There are sufficient opportunities for promotion
- My job is a good match for my skills and experience
- My job description is clear and up-to-date
- I receive recognition for doing good work
- Feel the organization values my work
- Have access to coaching and mentoring when needed
- Would encourage my friends and family to seek care here
- Facility protects me against occupational hazards
- I consider myself part of the local community
- I feel the community values my work
- I have good relationship with co-workers
- Overall the morale level in my team is good
- I intend to continue working here for at least two years
- My workload is reasonable
- Can take time to each lunch almost every day
- Have the supplies I need to do my job well and safely
- Have working equipment to do my job
- The facility has good access to drugs
- My workspace is clean
- Have access to safe & clean water at work
- Have good access to electricity at work
- Have good internet connectivity at work
- My annual performance appraisal is based on my work plan
- Have a work plan developed with my supervisor
- My benefits are fair compared with other staff
- Am not worried about losing my job
- Have access to safe & clean water at home
- Have access to electricity at home
- Have a safe and efficient transportation to work
- Have access to good schooling for my children
- There is good shopping and entertainment
- I have good access to electricity at work
- Would encourage my friends and family to seek care here
- Facility protects me against occupational hazards
- I have good relationship with co-workers
- Overall the morale level in my team is good
- I intend to continue working here for at least two years
- My workload is reasonable
- Can take time to each lunch almost every day
- Have the supplies I need to do my job well and safely
- Have working equipment to do my job
- The facility has good access to drugs
- My workspace is clean
- Have access to safe & clean water at work
- Have good access to electricity at work
- Have good internet connectivity at work
- My annual performance appraisal is based on my work plan
- Have a work plan developed with my supervisor
- My benefits are fair compared with other staff
- Am not worried about losing my job
- Have access to safe & clean water at home
- Have access to electricity at home
- Have a safe and efficient transportation to work
- Have access to good schooling for my children
- There is good shopping and entertainment
There is good shopping and entertainment
Have access to good schooling for my children
Have a safe and efficient transportation to work
Have access to good schooling for my children
There is good shopping and entertainment

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree (%)</th>
<th>Not agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considering everything, I am satisfied</td>
<td>48.8%</td>
<td>51.2%</td>
</tr>
<tr>
<td>My salary is fair compared to other staff</td>
<td>13.4%</td>
<td>86.6%</td>
</tr>
<tr>
<td>There are sufficient opportunities for promotion</td>
<td>30.7%</td>
<td>69.3%</td>
</tr>
<tr>
<td>My benefits are fair compared with other staff</td>
<td>24.4%</td>
<td>75.6%</td>
</tr>
<tr>
<td>My job is a good match for my skills and experience</td>
<td>7.4%</td>
<td>92.6%</td>
</tr>
<tr>
<td>My job description is clear and up-to-date</td>
<td>63.0%</td>
<td>37.0%</td>
</tr>
<tr>
<td>I receive recognition for doing good work</td>
<td>60.0%</td>
<td>39.4%</td>
</tr>
<tr>
<td>My supervisor applies personnel policies fairly to me</td>
<td>42.5%</td>
<td>57.5%</td>
</tr>
<tr>
<td>Have a work plan developed with my supervisor</td>
<td>44.1%</td>
<td>55.9%</td>
</tr>
<tr>
<td>Annual performance appraisal is based on work plan</td>
<td>57.5%</td>
<td>42.5%</td>
</tr>
<tr>
<td>I feel the organization values my work</td>
<td>60.6%</td>
<td>39.4%</td>
</tr>
<tr>
<td>My supervisor is available when I need support</td>
<td>42.2%</td>
<td>57.8%</td>
</tr>
<tr>
<td>Have been given the training I need to succeed</td>
<td>47.2%</td>
<td>52.8%</td>
</tr>
<tr>
<td>Have access to coaching and mentoring when needed</td>
<td>26.6%</td>
<td>73.4%</td>
</tr>
<tr>
<td>Would encourage my friends and family to seek care here</td>
<td>37.0%</td>
<td>63.0%</td>
</tr>
<tr>
<td>Facility takes protects me against occupational hazards</td>
<td>55.9%</td>
<td>44.1%</td>
</tr>
<tr>
<td>I consider myself part of the local community I serve</td>
<td>41.7%</td>
<td>58.3%</td>
</tr>
<tr>
<td>I feel the community values my work</td>
<td>90.6%</td>
<td>9.4%</td>
</tr>
<tr>
<td>I feel head of facility is competent and committed</td>
<td>90.5%</td>
<td>9.5%</td>
</tr>
<tr>
<td>I have good relationship with co-workers</td>
<td>50.4%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Overall the morale level in my team is good</td>
<td>96.1%</td>
<td>3.9%</td>
</tr>
<tr>
<td>I intend to continue working here for at least two years</td>
<td>62.2%</td>
<td>37.8%</td>
</tr>
<tr>
<td>My workload is reasonable</td>
<td>23.6%</td>
<td>76.4%</td>
</tr>
<tr>
<td>Can take time to each lunch almost every day</td>
<td>71.7%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Have the supplies I need to do my job</td>
<td>65.4%</td>
<td>34.6%</td>
</tr>
<tr>
<td>Have working equipment to do my job</td>
<td>60.6%</td>
<td>39.4%</td>
</tr>
<tr>
<td>The facility has good access to drugs</td>
<td>13.2%</td>
<td>86.8%</td>
</tr>
<tr>
<td>My workspace is clean</td>
<td>49.6%</td>
<td>50.4%</td>
</tr>
<tr>
<td>Have access to safe clean &amp; water at work</td>
<td>47.2%</td>
<td>52.8%</td>
</tr>
<tr>
<td>Have good access to electricity at work</td>
<td>48.0%</td>
<td>52.0%</td>
</tr>
<tr>
<td>Have good internet connectivity at work</td>
<td>71.7%</td>
<td>28.3%</td>
</tr>
<tr>
<td>Am not worried about losing my job</td>
<td>10.2%</td>
<td>89.8%</td>
</tr>
<tr>
<td>Have access to safe &amp; clean water at home</td>
<td>71.4%</td>
<td>28.6%</td>
</tr>
<tr>
<td>Have good access to electricity at home</td>
<td>50.4%</td>
<td>49.6%</td>
</tr>
<tr>
<td>Have a safe and efficient transportation to work</td>
<td>68.5%</td>
<td>31.5%</td>
</tr>
<tr>
<td>Have access to good schooling for my children</td>
<td>20.5%</td>
<td>79.5%</td>
</tr>
<tr>
<td>There is good shopping and entertainment</td>
<td>22.6%</td>
<td>77.4%</td>
</tr>
<tr>
<td>Would encourage my friends and family to seek care here</td>
<td>10.2%</td>
<td>89.8%</td>
</tr>
</tbody>
</table>

Figure 2: Health officers satisfaction with their job, and working and living conditions
Figure 3: Perception of importance of compensation and benefits for a decision to stay in the job

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Physicians (P)</th>
<th>Health Officers (HO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary</td>
<td>47.2%</td>
<td>88.2%</td>
</tr>
<tr>
<td>Duty allowance</td>
<td>4.7%</td>
<td>89.8%</td>
</tr>
<tr>
<td>Risk allowance</td>
<td>6.3%</td>
<td>86.6%</td>
</tr>
<tr>
<td>Housing allowance or free housing</td>
<td>8.7%</td>
<td>85.0%</td>
</tr>
<tr>
<td>Assistance with transportation</td>
<td>9.4%</td>
<td>75.6%</td>
</tr>
<tr>
<td>Housing allowance or free housing</td>
<td>8.3%</td>
<td>88.8%</td>
</tr>
<tr>
<td>Healthcare for family</td>
<td>9.5%</td>
<td>85.0%</td>
</tr>
<tr>
<td>Food allowance during duty hours</td>
<td>16.5%</td>
<td>70.1%</td>
</tr>
<tr>
<td>Terminal benefits</td>
<td>18.4%</td>
<td>63.5%</td>
</tr>
</tbody>
</table>

Note: P=physicians and HO=health officers
Figure 4: Perception of importance of factors for a decision to leave their job

Note: P=Physicians; HO=Health officers
CHAPTER 7
General Discussion
Chapter 7: General Discussion

This thesis aimed to identify needs for optimizing the health workforce in Ethiopia with focus on the SRMNH workforce, thereby generating evidence to improve HRH policies and programs, and ultimately to improve health outcomes. The conceptual framework (Figure 1) summarizes which aspects of the health workforce are assessed by the different studies in the thesis, and the pathway linking health workforce strengthening to improvement in health outcomes.

Most of the studies were designed as part of a donor-funded project, which aimed to support efforts of the Government of Ethiopia to improve the status of human resources for health. The study topics are relevant and timely not only for Ethiopia but also many low and middle income countries. First of all, there is better recognition of the role of midwives in ending preventable maternal and newborn deaths. The world has committed to end preventable maternal, newborn and child deaths by 2030 [1]. We know that well-educated and supported midwives can provide most of the care mothers and newborns need. We also know that universal coverage with quality midwifery care can avert 83% of maternal deaths, stillbirths, and newborn deaths [2-4].

Secondly, there is unprecedented emphasis on health workforce and health systems strengthening, especially as related to Sustainable Development Goals (SDGs) [1, 5, 6]. This thesis addressed some of the most important workforce challenges; namely, quality of pre-service education, performance and quality of healthcare, motivation and retention of health workers, and cultural competence (Figure 1). Improving quality of education and healthcare are top national and global priorities [2, 7-11]. Enhancing satisfaction, motivation and retention of health workers is also a priority workforce agenda [5, 12]. Cultural competence is also increasingly
recognized as one of the essential competencies in healthcare, as it can affect access to health services, effectiveness of care, patient-provider communication, and client satisfaction [2, 11, 13, 14].

Thirdly, there is limited human resources for health (HRH) research evidence from low and middle income countries. Hence, the different studies in this thesis (see Figure 1) make an important contribution to the body of knowledge on availability, accessibility, acceptability, and quality of the health workforce and midwifery in low and middle income countries [1, 5, 6, 15, 16]. Findings and implications of the thesis will be discussed in this chapter.

Pre-service education

The content and quality of pre-service education directly determines competence of health workers, and consequently quality and acceptability of health workers and healthcare services (See Figure 1). The different studies in this thesis have identified important gaps in pre-service education of the SRMNH workforce that call for urgent action. The midwifery students study (chapter 2) found low achievement of essential midwifery competencies, gender disparity in performance, and deficiencies in the causal chain of educational inputs, processes, outputs, and outcomes. The midwifery task analysis study (chapter 3) found that tasks related to gynecology, public health, some obstetric complications, and prevention of mother to child transmission of HIV (PMTCT) were less likely to be learned during pre-service education and mastered. The intrapartum care study (chapter 4) showed a significant percent of midwives were not comfortable in providing routine and emergency labor, delivery, and immediate postpartum care. The cultural competence study (chapter 5) showed that maternal healthcare providers did not adequately address the socio-cultural expectations of women and their families. Taken
together, these findings clearly indicate not only the need to improve quality of pre-service education of the SRMNH workforce, but also the specific areas to be strengthened.

Comparable results have been reported by other studies of pre-service education in Ethiopia. Assessment of graduating students in 2013 and 2015 reported substantial deficiencies in nutrition knowledge and skills among midwives and nurses, and low attainment of competencies and poor quality of education among anesthesia students [17, 18]. Qualitative investigation of faculty perceptions in 26 public higher education institutions in 2013 confirmed presence of major human resource, infrastructural, and logistical gaps in midwifery and anesthesia education programs [19]. The thesis findings warrant actions to improve quality of pre-service education. Investment in faculty recruitment and development is necessary to improve the number and teaching skills of midwifery teachers and preceptors. Midwifery curricula should be reviewed to strengthen relevant contents and ensure competency-based education. Investment is needed to improve educational infrastructure with focus on access to electronic learning resources and simulation-based training. Quality and monitoring of clinical learning should be improved to ensure that students meet curriculum requirements and master essential competencies. Strengthening internal quality assurance systems and applying accreditation standards on public midwifery schools is recommended to promote continuous quality improvement and meet education standards [10, 20, 21]. Gender transformative strategies are necessary to examine and address causes of performance gap between female and male students [22]. Mechanisms should also be devised to improve skills of new graduates and ensure their fitness to practice [10].

**Quality of performance of the existing workforce**
No matter how good the quality of pre-service education may be, health workers should be supported to be lifelong learners and work in an enabling environment in order to provide high quality healthcare and improve health outcomes (See Figure 1). The different chapters in this thesis found substantial weaknesses in performance of the SRMNH workforce and their work environment. The intrapartum care study (chapter 4) revealed significant gaps in provider competence, continuing professional development opportunities, and physical resources. The cultural competence study (chapter 5) showed limitations in providers’ knowledge, skills and attitude to provide culturally sensitive maternal healthcare to women coming to antenatal, labor and delivery, and postnatal clinics. The task analysis study (chapter 3) found low capability, limited training opportunities, and infrequent performance of tasks related to gynecology, emergency obstetric care, and public health.

These findings generally corroborate observations from other studies in Ethiopia. The 2008/9 national emergency obstetric and newborn care (EmONC) assessment covering 797 facilities had found that a great majority of facilities did not provide the full range of EmONC services in the last three months. Many facilities especially health centers had substantial skills, drugs, supplies, equipment and infrastructure gaps. Interviews with maternal health service providers found low knowledge related to maternal and newborn care [23]. A quality of care study conducted in 2011 involving 19 hospitals had concluded that the quality of observed care did not meet international standards for antenatal, labor and delivery, and essential newborn care [24]. In a quality improvement study done in 2014, providers’ performance scores in routine maternal and newborn care at intervention and comparison sites were found to be 63.4% and 61% for antenatal, 77.5% and 65.6% for labor and delivery, 72.8% and 50.6% for immediate postnatal
care, respectively, demonstrating significant gaps even after the intervention [25]. From the perspective of receiving culturally competent care, a majority of observed women were not asked about their preferred birthing position nor were they allowed to give birth in a position of their preference. Moreover, women did not receive one-third of elements of respectful maternity care, and 36% experienced at least one form of mistreatment [26]. Another respectful maternity care study involving five countries in Eastern and Southern Africa also reported that Ethiopian providers were the least likely to greet respectfully, provide necessary information, promote women’s right to choose care practices, ensure privacy, and provide friendly support [27].

Hence, we assert that Ethiopia’s aspirations to improve quality of care and markedly reduce maternal and newborn deaths will depend on its ability to address these health workforce and health systems gaps. The quality of performance of the SRMNH workforce should be enhanced through strong continuing professional development, and effective performance and quality improvement strategies including promotion of people-centered and culturally appropriate care. The Ministry of Health should also ensure that standards for availability of essential drugs, equipment, supplies, and infrastructure in health facilities are met [13].

**Satisfaction, motivation, and retention**

As indicated in our conceptual framework (Figure 1), satisfaction, motivation, and retention of health workers impacts availability, accessibility, acceptability, and quality of health workers and, by extension, health services [28-34]. Unsatisfied and unmotivated health workers are less likely to provide quality health services and meet expectations of patients and populations. High attrition and frequent turnover of health workers especially in places of low workforce density
can undermine availability and accessibility of healthcare services. Our study on this topic (chapter 6) focused on physicians and associate clinicians (ACs), who play a vital role in delivering interventions essential to attain the SDGs. Because physicians and ACs often lead healthcare services in Ethiopia’s public health system, their dissatisfaction will likely impact other members of the healthcare team. Our study found low levels of satisfaction and motivation, and high turnover intention among physicians and associate clinicians alike. Salary, and allowances for duty, professional risk and housing, were rated highly important to stay committed in a facility. On the other hand, low pay, poor access to higher education, and limited opportunities for promotion were the top three reasons for a decision to leave. Satisfaction with salary and benefits, human resource management and work climate, and recognition and appreciation were independent predictors of overall job satisfaction. Overall job satisfaction was negatively associated with turnover intention. However, the likelihood of job satisfaction and turnover intention did not differ between physicians and associate clinicians when effect of confounders was controlled.

These findings are generally consistent with findings of studies with nurses and anesthetists. The prevalence of dissatisfaction (lack of satisfaction) found in our study (60.8% for physicians and 51.2% for associate clinicians) is similar to report of 57.5% among anesthetists but higher than the 39.2% among nurses [35, 36]. The prevalence of turnover intention of physicians in our study (47.5%) was similar to the 50.2% among nurses and 47.8% among anesthetists, but associate clinicians (61.4%) in our study had a higher desire to leave [37, 38].

The findings from this study have important implications for national and global goals. Ethiopia’s health sector transformation plan, which runs from 2015 to 2019, states that improving quality
and equity of health care, and ensuring health workers are compassionate, respectful and caring are two of the four transformation agendas [8]. The national HRH strategy also seeks to enhance motivation and retention, and reduce inequitable distribution of health workers [14]. Optimizing the satisfaction, motivation and retention of health workers and providing decent working conditions are also global HRH policy priorities [5]. Our findings suggest that these goals will remain wishes if actions are not taken to address the broad range of frustrations faced by doctors and associate clinicians, with emphasis on improving salaries and benefits, human resource management practices, and recognition and appreciation. Major salary revision, which enables decent living, is a preferred policy option but may not be easy for a low income country like Ethiopia. Another option is formalizing public-private partnership to enable dual employment, with clearly defined and carefully regulated performance indicators. Although these policy options are likely to require a long and difficult political process, it is clear from our data that Ethiopia’s health system will suffer from suboptimal motivation, distribution, retention, and performance without a competitive income for health workers. Improving management and leadership practices including fostering a culture of appreciation and recognition of health workers will also have a positive impact [39, 40]. This can be advanced by scaling up existing postgraduate training programs in health facility administration and HRH management, and implementing the national healthcare quality strategy effectively to improve working conditions [41]. To wrap up, the Government of Ethiopia should boldly address the causes of health workers’ job dissatisfaction and demotivation in order to improve equity and quality of healthcare and attain SDGs.

**Evidence use in HRH policies and programs**
One of the objectives of the Strengthening Human Resources for Health Project was to generate program learning and research evidence on critical HRH issues. Accordingly, a number of implementation studies, including four of the five studies in this thesis, were designed, implemented and written in collaboration with the Ministry of Health. The Ministry of Health reviewed and approved study plans. Relevant persons from the Ministry were involved in supervision of data collection activities. Study findings and their implications were shared and discussed with the Ministry of Health. MOH staff were also invited to manuscript writing workshops. HRH Project staff also worked with the Ministry of Health to facilitate evidence use in workforce policies and programs. The following paragraphs illustrate how evidence from the studies in this thesis informed ongoing capacity building interventions.

The HRH Project implemented a number of capacity building interventions to improve quality of pre-service midwifery education. These included curriculum revision, faculty development, improving infrastructure and resources, expansion of clinical education sites and processes, supporting gender activities to address performance disparities between male and female students, strengthening quality improvement processes in midwifery schools using education standards, and development of national midwifery accreditation standards. These interventions are already showing early results. An evaluation study of graduating students in 2016 documented encouraging progress, although additional efforts are required for accelerated and greater impact [42]. More pre-service and workplace studies should also be conducted periodically to evaluate continuous improvements over time.

Transition from pre-service education to practice is critical, as health workers should be fit to practice before they start independent practice. The findings from this thesis were instrumental
in informing health systems priorities during this transition. First, in addition to gaining insight about quality of pre-service education, the assessment of midwifery students at the point of graduation helped to stress the need for new graduates mentoring and support. The HRH Project in collaboration with the Ethiopian Midwifery Association and Ministry of Health deployed senior midwives in rural health centers to enhance skills and confidence of newly qualified midwives. While this was a successful initiative, the coverage and timeframe was limited. The Ministry of Health must, therefore, develop cost-effective and sustainable new graduate mentorship programs to boost competence of newly qualified midwives and ensure the safety and quality of healthcare provision in the future. Secondly, a national licensing examination was introduced to verify that new graduates have the minimum competencies for entry-level practice [43]. Results from the task analysis study guided development of the first national licensing examination for university graduates. The examination was introduced in 2015 and is expected to continue. While the results did not prevent students who failed in the examination from joining the workforce during the pilot phase, serious lessons were learned by universities and ministries of education and health, which are likely to have a positive impact on quality of education.

With respect to improving quality of performance of health workers, with support from the HRH Project, the Ministry of Health prepared a national in-service training directive and guideline [44], established 46 in-service training centers distributed all over the country, and reviewed and standardized several national in-service training packages. Professional associations including the Ethiopian Midwifery Association were supported to develop continuing professional development (CPD) courses based on learning needs identified by task analysis studies including the midwifery task analysis study. The HRH Project also supported development of CPD
guidelines and directives [45], although its implementation has not progressed as expected, due to concerns about readiness and capability of the health system. The current health sector plan has set clear goals to improve quality of care, performance of health workers, and health facility infrastructure [8]. The Ministry of Health has also developed a strategic plan to transform quality of healthcare [41]. While these are positive developments, the quality and speed of implementation in a sustainable manner will determine their effectiveness. This needs to be regularly monitored by strengthening the health information system. Research and evaluation studies are also required to assess quality improvement of midwifery care over the coming years.

Regarding health workforce motivation and retention, the HRH Project supported the Ministry of Health to develop a national human resources for health strategic plan (2016-2025), which lists enhancing motivation and retention as one of the strategic objectives [14]. A multi-cadre satisfaction and retention study, from which the physician and AC data were drawn, helped to prioritize motivation and retention in the strategic plan [46]. The Project supported opening of postgraduate training programs in HRH management in three local universities. Also noteworthy is the short-term in-service training of more than 2,400 human resource managers and staff to enhance their human resource management skills. The HRH Project has been mentoring and coaching human resource personnel at all levels of the healthcare system to improve their practices. The HRH Project supported the Ministry of Health to conduct job evaluation and grading in 2017. However, whether that would lead to fairer compensation for health workers remains to be seen. In a nutshell, while more needs to be done, the implementation studies in this thesis have informed and continue to inform health workforce strengthening interventions in Ethiopia.
To conclude, the different studies in this thesis have identified and discussed needs for optimizing the health workforce in Ethiopia. They clearly showed the need to improve quality of pre-service midwifery education to ensure sufficient learning experiences and attainment of essential competencies. They illustrated the substantial gaps in performance of existing midwifery workforce as well as continuing professional development and healthcare quality improvement systems. Shortfalls in cultural competence of maternal health care providers were highlighted. The magnitude and drivers of dissatisfaction, demotivation, and turnover intention of physicians and associate clinicians were also uncovered. Considering that health workforce studies with national coverage are not common in low and middle income countries, evidence generated in this thesis makes an important contribution to the knowledge base to improve availability, accessibility, acceptability and quality of health workers. It is hoped that countries grappling with similar health workforce challenges will find important lessons from these studies.

Reflection on validity of thesis findings

In this section, I reflect on internal and external validity of the different studies in my thesis. The first article (Chapter 2) in my thesis assessed quality of pre-service midwifery education in public higher education institutions. One source of validity evidence is the content of the assessment. The paper evaluated evidence-based essential elements of pre-service education comprehensively; namely, inputs (availability of instructors and preceptors, and educational infrastructure and resources), processes (quality of teaching, learning and assessment activities in classroom, laboratory and clinical settings), output (meeting curriculum requirements for number of births to managed), and outcome (attainment of midwifery competencies) [21]. Furthermore, the midwifery competencies, which were included in the study, were mapped from
the ICM competencies for basic midwifery education [47] and national curricula. The competencies reflected a broad range of midwifery tasks (family planning, abortion care, antenatal care, care during labor and delivery, postpartum care, care for the newborn, management of childhood illnesses) including routine and emergency care. The other source of validity evidence is the selection of a nationally representative sample of graduating midwifery students. The study involved a large sample of midwifery students (484) randomly selected from most (83.3%) of the eligible public midwifery education institutions in the country, increasing generalizability of the conclusions. Competence of students was assessed by a 10-station objective structured clinical examination (OSCE) - a widely used performance assessment method even in high stakes settings-, which is believed to minimize measurement errors and improve reliability [48-51]. The internal consistency of station checklists was acceptable, with Cronbach’s alpha ranging from 0.61 to 0.86. The use of trained and experienced subject matter experts to administer the assessment also lends support to the credibility of my study findings. However, the study is not without limitations. Student self-reports (perceptions) on inputs, processes and outputs may not exactly match reality. The OSCE was conducted in a simulated setting, and this may have reduced validity of the competence assessment results as a measure of true competence in the actual workplace.

The second article (chapter 3) presented findings of task analysis of midwives. Task analysis is a widely accepted and rigorous methodology for identifying needs and gaps in education, training, practice and certification examinations [52-58]. A major source of validity evidence for this study is content-related validity due to the comprehensiveness of the task list and expert consensus. A comprehensive task list was developed based on review of national midwifery scope of practice,
curricula and job descriptions. The task list was validated by a panel of experts including practitioners, educators, and representatives of the national midwifery association and the Federal Ministry of Health. However, in hindsight, I recognize that the wording of some of the tasks could have been improved: some tasks were not clear and specific enough. But this could have markedly increased the length of the questionnaire creating respondent fatigue. Another source of validity evidence is that selection of study participants ensured representation of different geographic and practice settings. The sample was drawn from six of the nine regional states and one of the two city administrations in the country. Midwives working in both hospitals and health centers were also represented. Hence, I think the findings can be generalized to all midwives in Ethiopia. However, there were limitations with the sample size and sampling procedure. The number of midwives invited from each region was not determined based on statistical assumptions but rather on program lessons in implementing similar studies in other countries. Facilities and providers were not selected randomly. Instead, each regional health bureau was asked to select geographically representative facilities, and each facility was in turn responsible to purposively select a midwife. Another possible source of bias is the use of self-report. Social desirability bias is a concern especially in assessing competence of providers. But the high level of “not capable responses” for some of the tasks makes this suspicion less likely. Frequency of performance responses are also susceptible to recall bias. But the results were plausible in view of practice realities.

My third article (chapter 4) sought to assess quality of intrapartum care provided by midwives. The first support for internal validity of my study findings is content-related validity. This study assessed many essential elements of evidence-based quality of care conceptual frameworks,
namely, the Donabedian structure-process-outcome model [59-66] and the cross-sectoral performance and quality improvement framework [67]. We assessed availability of physical resources and infrastructure, professional competence including communication skills and professional behaviors, learning and performance improvement practices, and outcome of care including maternal and newborn complications and deaths. The other source of validity evidence is the use of appropriate and multiple measurement techniques. Intrapartum care was directly observed from admission to the labor ward through childbirth up until 6 hours postpartum. Competence was evaluated by expert midwives who had hands-on training and experience with the task. Observation was standardized using a global rating scale with behavioral descriptors. The tool had very high reliability (Cronbach’s Alpha=0.94). The use of mixed methods (inventory and structured interview) to assess availability of resources allowed triangulation. This study findings are also generalizable to Ethiopia as a whole and other low income countries. The study was conducted in the second most populous region of Ethiopia, with a population of 20.4 million. Sampling procedures ensured selection of regionally representative health facilities and midwives. However, the exclusion of health facilities with low delivery caseload due to efficiency considerations can be considered a limitation.

My fourth article (chapter 5) focused on cultural competence of maternal healthcare providers. A source of content-related validity evidence in this study is the adaptation of cultural constructs developed by Campina-Bacote, which had been used in different settings and demonstrated good reliability and validity in previous studies [68]. While adaptation to local context was necessary to improve validity, the change made to Campina-Bacote’s “Inventory for Assessing the Process of Cultural Competence among healthcare professionals-Revised” (IAPCC-R) tool may
have altered its reliability. The good news is that our tool retained acceptable reliability, with Cronbach alpha ranging from 0.63 to 0.72 for the different sub-scales. Moreover, triangulation by adding a qualitative component with clients must have increased validity of our conclusions. However, the inherent bias associated with self-report to measure practical competence can be mentioned as a limitation.

The fifth manuscript (chapter 6) dealt with satisfaction, motivation and turnover intention of physicians and associate clinicians. The source of content related validity evidence is that the key variables included in the study have widespread support in health worker satisfaction, motivation and retention literature [69]. That the study tool was previously tested in East Africa and reviewed by Ethiopian experts to adapt to local context lends further support to its validity. The selection of a nationally representative sample of respondents makes our conclusions generalizable to all physicians and associate clinicians working in the public health sector. However, the relatively small number of associate clinicians should be acknowledged as a limitation. The use of structured interview as a data collection technique is appropriate and common for this kind of study, which aimed to assess a psychological state of mind such as satisfaction and turnover intention. Although this type of research is liable to social desirability bias, the high level of negative findings (dissatisfaction and turnover intention) in my study suggest that this was less likely to be the case. However, longitudinal study design would have been more appropriate to identify determinants of satisfaction and motivation, and measure actual turnover.

An overall source of validity evidence for the thesis findings is the convergence of conclusions from the different components of my thesis. The study of graduating midwifery students, the
task analysis with recently qualified midwives, the intrapartum quality of care study, and the cultural competence study were all consistent in showing gaps in quality of pre-service education. The task analysis study, intrapartum quality of care study and cultural competence study alike agreed that there were competence gaps in the existing workforce. The task analysis and intrapartum quality of care studies indicated shortcomings in continuing professional development or performance improvement systems. Key findings of the thesis (unsatisfactory quality of pre-service education, sub-optimal competence of existing workforce, deficiencies in the enabling environment, and low levels of satisfaction and motivation) are also generally in agreement with results of other studies from Ethiopia and similar settings.

Finally, since four of the five studies in my thesis were part of a project, a question may be asked about the untoward effect of involving the ministry of health staff in research undertaking. Involvement of the Ethiopian Ministry of Health in the studies aimed to ensure buy-in of the research agenda, relevance of the research questions to national priorities, and utilization of study findings to optimize HRH policies and programs. The second objective was to build local research capacity. As the studies were tied to a donor-funded project with systems strengthening mandate, it was imperative that research just like other project activities had to be carried out in partnership with the government. However, it was the Project’s responsibility to select research topics based on program needs, design study protocols and implement studies. I truly believe engaging relevant stakeholders is key in implementation research and declare that none of the conclusions were influenced by the involvement of the Ethiopian Ministry of Health.
References


52. The Office for Domestic Preparedness. The ODP training strategy.


CHAPTER 8

Summary
Chapter 8: Summary

The aim of this thesis work was to identify needs for optimizing the health workforce in Ethiopia with focus on the SRMNH service providers. Four of the five studies are linked to implementation of the USAID-funded Strengthening Human Resources for Health Project (2012-2018), which sought to support efforts of the Government of Ethiopia to improve human resources for health status.

Chapter 1 is a general introduction. It provided country context and explained why it is important to strengthen the health workforce, including its linkage to attaining the Sustainable Development Goals. It reviewed the state of the health workforce in Ethiopia and globally from availability, accessibility, acceptability and quality perspectives. It indicated that Ethiopia is investing on its health workforce but still faces multiple challenges, including, but not limited to, shortage of health workers, poor quality of pre-service education, gaps in performance and quality of healthcare, and low motivation and high turnover of staff. It also emphasized the need for more and better research evidence to inform HRH policies and programs. It ended by describing the conceptual framework and components of the thesis (Figure 1).

Chapter 2 presented results of an assessment of quality of pre-service midwifery education at public higher education institutions (universities and regional health science colleges). A cross-sectional study conducted in June 2013 with 484 graduating midwifery students from 25 universities and regional health science colleges found major gaps in the causal chain of educational inputs, processes, outputs, and outcomes. The majority of students rated the learning environment unfavorably on eight out of ten questions. Only 32% of students attended 20 or more births under supervision. The mean competence score of students in a 10-station
objective structured clinical examination was found to be 51.8%. Male gender, perceived sufficiency of clinical experience and higher number of attended births predicted a better competence score.

Chapter 3 described results of a midwifery task analysis study. A cross-sectional study involving 138 midwives with 6 months to 4 years’ experience was conducted in 2013 in seven regions to identify needs for strengthening midwifery education, practice and regulation. The study showed that practising midwives lacked competencies in gynecology, public health, emergency obstetric care, and prevention of mother to child transmission of HIV. These competencies were less likely to be learned during pre-service education and less likely to be performed frequently. Results of this study were used to design a blueprint for a national licensing examination.

Chapter 4 presented findings of an intrapartum quality of care study. A cross-sectional study was conducted in Amhara Regional State in 2015 involving 150 midwives and 56 health facilities. Direct observation of care found that 16.5% and 9% of midwives were not competent in routine and emergency intrapartum care, respectively. Inventory of resources revealed major gaps in drugs, equipment and supplies. For instance, only 32.6% of facilities had more than 75% of the essential drugs. Learning and performance improvement opportunities were also found inadequate; less than half of respondents received basic emergency obstetric and newborn care training, and frequent supportive supervision.

Chapter 5 described results of a cultural competence study. A cross-sectional study was conducted in 2012 in Bahir Dar City, northwest Ethiopia, involving 274 maternal healthcare providers. The mean cultural competence of maternal healthcare providers was found to be
57.3%. In-depth interviews with women receiving maternity care corroborated the gaps in cultural competence of providers.

Chapter 6 presented findings of physicians’ and associate clinicians’ job satisfaction, motivation and turnover intention in Ethiopia’s public health sector. A cross-sectional comparative study involving 375 physicians and 127 associate clinicians was conducted in 2014. The results demonstrated that the majority of physicians (60.8%) and associate clinicians (51.2%) were unsatisfied with their job; and 47.5% and 61.4%, respectively, were planning to leave their facility within one year. Salary, and allowances for duty, professional risk, and housing, were rated highly important to stay committed in a facility. Low pay, poor access to higher education, and limited opportunities for promotion were the top three reasons for a decision to leave. Furthermore, satisfaction with salary and benefits, human resource management and work climate, and recognition and appreciation independently influenced overall job satisfaction. Lack of job satisfaction increased the odds of turnover intention by two-fold. However, there was no difference in satisfaction and turnover intentions between physicians and associate clinicians when confounders were controlled for.

Chapter 7 is the general discussion. It presented key findings, implications, comparisons with results of other studies, and reflections on the study methods. It concluded that there are: 1) important gaps in pre-service midwifery education; 2) substantial weaknesses in performance of SRMNH workforce, availability of physical resources, and learning and quality improvement systems; and 3) low levels of satisfaction and motivation and high turnover intention among physicians and associate clinicians alike. The discussion also reflected on how the different studies informed HRH policies/programs and validity of the findings in the thesis.
Annex 1: ACKNOWLEDGEMENT

I am indebted to my promoters Prof. Dr. Jos van Roosmalen and Prof. Dr. Jelle Stekelenburg and co-promoter Dr. Young-Mi Kim for enabling me to do my PhD.

I would like to thank the thesis committee members Prof. Dr. J.I.P. de Vries, Dr. B.E. Kwast, Prof. Dr. S.A. Scherjon, Prof. Dr. P. Teunissen, and Dr. T. van der Akker.

I am grateful for the “Strengthening Human Resources for Health” (S-HRH) Project and its staff, which is implemented by Jhpiego, Management Sciences for Health (MSH), Ethiopian Midwives Association, Ethiopian Association of Anesthetists, Open University and Project Mercy. Four of the five studies in this thesis (chapters 2, 3, 4 and 6) were conducted as part of the S-HRH Project in Ethiopia (Cooperative Agreement AID-663-A-12-008) and were made possible by the generous support of the American people through the United States Agency for International Development. The publication of this monograph was also financially supported by the S-HRH Project. Dr Damtew Woldemariam, Chief of Party for the S-HRH Project, deserves a special mention for his positive leadership style. I would like to note that the contents of this monograph are the responsibility of the author and do not necessarily reflect the views of Jhpiego, USAID, or the United States Government.

I would like to extend my gratitude to the ministries of health and education, education institutions, study participants, research team members, and other partner institutions and individuals who supported implementation of the S-HRH Project.

Finally I would like to thank my family and friends whose enthusiasm energized me to undertake this learning journey.
Annex 2: Curriculum Vitae

Tegbar Yigzaw Sendekie was born in Debre Tabor, northwest Ethiopia.

He studied medicine at Jimma University, Ethiopia (1994-2001), and completed a master’s degree in public health (MPH) at Addis Ababa University, Ethiopia (2003-2005). He also did a fellowship in international medical education and research at FAIMER Institute, Philadelphia, USA (2009-2011).

He has sixteen years of work experience in public health and health professions education. From November 2001 to July 2007, he worked at University of Gondar, School of Public Health, as a faculty. He taught with different capacities including as an assistant professor of public health and served as head of the school of public health. After July 2007, he continued teaching and advising students at University of Gondar, Gamby Medical College, Addis Continental Institute of Public Health, and Jimma University. He is also a member of an advisory council for Debre Tabor University.

In 30 July 2007, Mr. Sendekie joined Jhpiego, a non-government organization affiliated to Johns Hopkins University. He has worked at Jhpiego with different capacities with progressively increasing responsibilities. Over the course of his stay, he supported donor-funded projects on human resources for health, pre-service education, quality improvement, continuing medical education, HIV/AIDS, basic emergency obstetric and newborn care, reproductive and maternal and newborn health, and nutrition. Mr. Sendekie is an international training expert.

Since 2012, he has been the Deputy Chief of Party and Technical Director for the USAID-funded Strengthening Human Resources for Health Project at Jhpiego. His contributions during this time
include, but are not limited to, design, implementation and management of donor-funded programs, development of national health policy and human resources for health strategic plan, design of education and training curricula, conducting faculty development courses, development of education accreditation and quality improvement standards, establishment of a national licensing examinations, and providing technical assistance to Jhpiego’s global programs on human resources for health. Four of the five studies in the thesis came from the Human Resources for Health Project he has been involved with.

Regarding honors, Mr. Sendekie was a recipient of the 2010 Young Public Health Research Award from the Ethiopian Public Health Association.
Annex 3: List of publications


7. Amanu Argaw, **Tegbar Yigzaw**, Desalegn Tetemke and Wubalem G/Amlak. Cultural competence among maternal healthcare providers in Bahir Dar City Administration,


12. **Tegbar Yigzaw**, Girma Temam, Jos van Roosmalen, Jelle Stekelenburg, Young-Mi Kim, Shelemo Shawula, Damtew Woldemariam, Eshete Yilma. Satisfaction, motivation and turnover intention of physicians and associate clinicians in Ethiopia’s public health sector:


Annex 4: Safe motherhood series

The Dutch Working Party ‘International Safe Motherhood and Reproductive Health’ aims to contribute to improvement of the reproductive health status of women around the globe, in particular by collaborating with local health workers (http://www.safemotherhood.nl). The Working Party is part of both the Dutch Society of Obstetrics and Gynaecology (NVOG) and the Dutch Society for International Health and Tropical Medicine (NVTG). The activities that are undertaken under the umbrella of the Working Party can be grouped into four pillars: education, patient care, research and advocacy.

Research activities are undertaken by (medical) students, Medical Doctors International Health and Tropical Medicine and many others. Some research activities develop into PhD-trajectories. PhD- candidates all over the world, Dutch and non-Dutch, work on finding locally acceptable and achievable ways to improve the quality of maternal health services, supervised by different members of the Working Party. Professor Jos van Roosmalen initiated the Safe Motherhood Series, which started in 1995.

The Safe Motherhood Series

- Safe motherhood: The role of oral (methyl)ergometrin in the prevention of postpartum hemorrhage. (Akosua N.J.A. de Groot), Nijmegen, 1995
- Safe motherhood: Perinatal assessment in rural Tanzania. (Gijs E.L. Walraven), Nijmegen, 1995
- Safe motherhood: Confidential enquiries into Maternal Deaths in Surinam. (Ashok S. Mungra), Leiden, 1999
- Safe motherhood: Reproductive health matters in rural Ghana. (Diederike W. Geelhoed), Leiden, 2003
- Safe Motherhood: Vaginal birth after caesarean section in Zimbabwe and The Netherlands (Wilbert A. Spaans), Amsterdam AMC, 2004
- Safe Motherhood and Health systems research: Health care seeking behaviour and utilisation of health services in Kalabo District (Jelle Stekelenburg), VU University Medical Centre, Amsterdam, 2004
- Safe Motherhood. Enhancing survival of mothers and their newborns in Tanzania (Godfrey Mbaruku), Karolinska Institute, Stockholm, Sweden, 2005
- Safe Motherhood. Severe maternal morbidity in the Netherlands: the LEMMoN study (Joost Zwart), Leiden University Medical Centre, the Netherlands, 2009
- Safe Motherhood. Obstetric audit in Namibia and the Netherlands (Jeroen van Dillen), VU University Medical Centre, Amsterdam, the Netherlands, 2009
- Safe Motherhood. Confidential enquiries into maternal deaths in the Netherlands 1993-2005 (Joke Schutte), VU University Medical Centre, Amsterdam, the Netherlands, 2010

- Delay in Safe Motherhood (Luc van Lonkhuijzen), University Medical Centre Groningen, the Netherlands, 2011

- Safe Motherhood: Medical Mirrors: Maternal care in a Malawian district (Thomas van den Akker), VU University Medical Centre, Amsterdam, the Netherlands, 2012

- Safe Motherhood: Leading change in the maternal health care system in Tanzania: application of operations research (Angelo Nyamtema, Ifakara, Tanzania), VU University Medical Center, Amsterdam, the Netherlands, 2012

- Safe Motherhood: Health professionals and maternal health in Malawi: mortality and morbidity at district level (Jogchum Beltman), VU University Medical Center, Amsterdam, the Netherlands, 2013

- Safe Motherhood: Obstetric emergencies in primary midwifery care in the Netherlands (Marrit Smit), Leiden University Medical Center, the Netherlands, 2014

- Safe Motherhood: Improving maternal outcome in rural Tanzania using obstetric simulation based training (Ellen Nelissen), VU University Amsterdam, the Netherlands, 2014

- Safe Motherhood: The aberrant third stage of labour (Giel van Stralen), Leiden University Medical Center, the Netherlands, 2015

- Safe Motherhood: Terugvinden van waardigheid, community-based sociotherapie in Rwanda, Oost-Congo en Liberia (Cora Bakker), VU University
- Safe Motherhood: Severe acute maternal morbidity, risk factors in the Netherlands and validation of the WHO Maternal Near-Miss Tool (Tom Witteveen), Leiden University Medical Center, the Netherlands, 2016

- Safe Motherhood: Getting the job done, providing lifelong HIV-treatment in settings with limited human resources for health: innovative approaches (Marielle Bemelmans), VU University Amsterdam, the Netherlands, 2016

- Safe Motherhood: Identifying needs for optimizing the health workforce in Ethiopia (Tegbar Yigzaw Sendekie), VU University Amsterdam, the Netherlands, 2017

- Safe Motherhood: Improving frontline health workers’ performance in low resource settings; the case of Ethiopia (Firew Ayalew Desta), VU University Amsterdam, the Netherlands, 2017

- Safe Motherhood: Increasing access to anesthesia in Ethiopia: task shifting (Sharon J.N. Kibwana), VU University Amsterdam, the Netherlands, 2017