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# Journal of Public Health and Epidemiology

## ARTICLES

*Full Length Research Paper*

# Helminthiasis and chronic suppurative otitis media in Ijoun Community in Ogun State, Nigeria

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This study, carried out in a rural community in Ogun state Nigeria, aims to determine the prevalence of soil-transmitted helminths, bacteria causing Chronic Suppurative Otitis Media (CSOM), and their coinfection among school-aged participants. Formol-ether sedimentation technique was used to check for helminth eggs in stool samples. Ear swabs collected were cultured on chocolate, blood and MacConkey agar plates. CD4+T lymphocyte count was derived using a flow cytometre. Study participants were between 5 and 19 years old. Three hundred participants were sampled, 108 (36%) were infected with helminth parasites: *Ascaris lumbricoides* (28.7%), hookworm (6.7%) and *Strongyloides stercoralis* (0.7%). The prevalence of helminth infection between the sexes was not statistically significant ($\chi^2 = 0.497$; P= 0.390), but statistically significant between the age groups ($\chi^2 = 10.10$; P=0.016). Mixed helminthic infections were found in only 3.3% of the study population. Seventeen participants (5.7%) were found to have CSOM. Bacteria isolated in the ear swabs were *Pseudomonas aeruginosa, Staphylococcus aureus, Klebiella pneumoniae, Proteus mirabilis* and *Haemophilus influenzae*. Only two percent (2%) of study population were co-infected with helminth and bacteria. Heavy intensity of helminths and heavy growth of bacteria was found in the coinfected when compared with single infected children. This study showed the presence of otitis media in the study area, and that helminthiasis might have an effect on its presentation. Efforts to control CSOM in the study site may need to consider the inclusion of mass deworming.

**Key words:** Chronic suppurative otitis media (CSOM), helminth, bacteria, coinfection, Ogun State, Nigeria.

## INTRODUCTION

Helminth infection is a major cause of disease burden among children in developing countries, especially in sub-Saharan Africa. This burden of helminthic infestations is a direct consequence of acute shortage of health care facilities, lack of access to potable water and sanitation, unhygenic environmental conditions and poverty (Crompton, 2001).

Soil-transmitted helminths are parasites causing human

infections in tropical and subtropical countries where the eggs or larvae of these parasites thrive in warm and moist soil, and adult worms live in the human gastrointestinal tract for years (Bethony et al., 2006). According to the World Health Organisation (WHO), over a billion people are infected with at least one species (WHO, 2005). Of particular worldwide importance are the roundworms (*Ascaris lumbricoides*), whipworms (*Trichuris trichiura*), and hookworms (*Necator americanus* or *Ancylostoma duodenale)* (Bethony et al., 2006). They are considered together because children in developing countries can be chronically infected with all three worms thereby causing such children to be malnourished with stunted growth, intellectual retardation and cognitive deficits (WHO, 2005). Bacteria are causes of infections which range from mild to life threatening. Commensal bacteria in the upper respiratory tract can become virulent and cause serious conditions, such as pneumonia, septicaemia and meningitis. Microbiology cultures of ear discharge in chronic suppurative otitis media (CSOM) often yield multiple organisms which are key etiological agents in the development of CSOM. Common bacteria cultured from the ear discharge includes *Pseudomonas aeruginosa*, *Staphylococcus aureus*, Proteus species, *Klebsiella pneumonia*.

Chronic Suppurative Otitis Media (CSOM) is defined as a chronic inflammation of the middle ear and mastoid cavity, which presents with recurrent ear discharges or otorrhoea through a tympanic perforation (WHO, 2004). CSOM remains one of the most common childhood chronic infectious disease worldwide, affecting diverse racial and cultural groups both in developing and industrialized countries, causing considerable morbidity and sometimes leading to extra- and intracranial complications (Trimis et al., 2003). The infection may occur during the first 6 years of a child's life reaching a peak around 2 years, and it is commonly found in developing countries in special populations such as children with craniofacial anomalies (Bluestone and Kenna, 1984; Berman, 1995). Infection is also found in certain racial groups (Berman, 1995).

The risk of infection with one organism being exacerbated by co-infection with a second species is understudied. An infection may physiologically change the within-host environment in a way that can enhance infection by another bacteria, for example *Leishmania* spp. creating an ulcerous wound that bacterial opportunists can exploit; and/or infection can cause changes in host immune response for example hookworm-induced suppression of the pro-inflammatory cytokine IFN-g causing increased parasitaemia with *Plasmodium* parasites (Graham, 2008; Allen and Maizels, 2011). Therefore, a parasitic species encountering an already infected host experiences a different environment than if that host was uninfected. Changes in an infected host's environment could potentially predispose, or protect, that host from a second infection, and or modulate the intensity of that infection (Celum et al., 2004; Allen and Maizels, 2011).

In a study carried out by Lass et al. (2012), they posited that co-infection is a driver of variation in parasite establishment and growth, ultimately altering the production of parasite transmission stages. In order to test this hypothesis, they divided laboratory mice into three differently infected groups. One group was infected with both self-bioluminescent bacteria (respiratory bacterial pathogen *Bordetella bronchiseptica* lux+) and intestinal helminth (*Heligmosomoides polygyrus*) whose egg production was monitored using faecal samples. A second group was infected with *H. polygyrus* only. They reported a significantly higher bacterial load in the lungs of co-infected animals compared with single infected animals. They also found that five of seven animals in the co-infected groups were super shedders (helminth eggs at a rate 2 s.d.s above single-infected) (Lass et al., 2012). Two or more parasites infecting the same tissue will influence each other directly, or have passive effects or active manipulation of the immune system if colonizing different organs (Cox, 2001).

In this study, we aimed to describe the impact of co-infection of helminth parasites and bacteria causing middle ear inflammation. We determined the prevalence of helminth parasites and co-infection with bacteria cultured from middle ear discharge among school aged students.

## MATERIALS AND METHODS

### Study area

This cross-sectional study was conducted in a rural community, Ijoun, in Yewa North Local Government Area of Ogun state located on latitude 7°15$^/$ N and longitude 2°9$^/$ E. The community lacks several basic amenities such as toilet facilities, pipe-borne water, electricity supply, proper waste disposal system and good road network.

### Sample size determination

The sample size was determined by the method described by Daniel (1999). Briefly, a prevalence of 16.8% obtained from estimated prevalence of soil transmitted helminths in Ogun State was used (Oluwole et al., 2015). Using a precision of 5% (0.05), a minimum sample size of 215 subjects was computed. Overall, 300 subjects were recruited for the study.

### Methodology

Stool samples were analyzed using formol-ether concentration technique (Cheesbrough, 2005), and examined microscopically for helminth eggs or larvae. Sample fluid or pus was collected from the middle ear with a sterile cotton-tipped swab. The swabs collected were immersed in cooked meat media and transported to the laboratory for culture on chocolate, blood and MacConkey agar culture media. Swab samples were inoculated and streaked on the culture media and plates were incubated aerobically at 37°C for 24 h. This was followed by examination of the culture media for any growth which was identified according to standard Microbiology

techniques. Venous blood samples (5 mL) were taken from the recruited participants by a medical practitioner. The blood samples were then transferred into an EDTA bottle labelled with the same identification number as the universal bottles used to collect stool samples, and the ones written on the record sheets. The ethylenediaminetetraacetic acid (EDTA) bottles were transported in an EDTA cooling box.

### Ethical approval

Ethical approval was obtained from the State Ministry of Health. Written informed consents were obtained from parents of children willing to participate in the study.

### Data analysis

The data obtained were summarized using descriptive and inferential statistics with the use of statistical package for social sciences (SPSS), version 20. Prevalence difference across groups was established using chi-square test statistics while intensities and haematological parameters across groups were compared using t-test at $\alpha = 0.05$.

## RESULTS

### Prevalence and intensity of helminthiasis

Of the 300 stool specimens examined, 36% showed evidence of helminth infection: *A. lumbricoides* 28.7%, hookworm 6.7% and *S.stercoralis* 0.7% (Table 1). *A. lumbricoides* was the most prevalent helminth infection amongst the infected pupils and was most prevalent among the 5 to 9 years age group (Table 1). The overall mixed infection was 3.3%; a total of 2.7% had dual infection involving *Ascaris lumbricoides* and hookworm infection, 0.6% had dual infection involving hookworm and *S. stercoralis.* There was no statistically significant difference between prevalence of helminth infection and the gender of the participants across all age groups but there was a significant difference between the prevalence of helminth infection and the age groups (Tables 2 and 3). The mean number of eggs per gram (epg) of feces for *A. lumbricoides* and hookworm, in the study population was 7,755±163.67 and 1,142±582, respectively. Analysis of epg of feces by species showed that 15.1 and 10% of the infected participants had heavy intensity of infections for *A. lumbricoides* and hookworms respectively (Table 4).

### Microscopy and culture of ear specimen

Discharge from the middle ear was seen in 29 (9.7%) children (Table 5). A little above half (17(58.6%)) of ear specimens of examined children yielded positive bacteria culture while the remaining 12 (41.4%) showed negative result. Males were more infected than females M:F (1:0.9), the greatest prevalence of infection was observed in the 5 to 9 years age group (75%) (Table 5). Five types of organisms were isolated: Pseudomonas aeruginosa,

*Staphylococcus aureus*, *Klebsiella pneumoniae*, *Proteus mirabilis* and *Haemophilus influenzae*. There was no significant difference between the prevalence of CSOM and gender across the age groups.

### Helminth and bacteria coinfection

The overall prevalence of helminth and bacteria (CSOM) co-infection in the study area was 2%. Co-infection of helminth and bacteria was observed only among the 10 to 14 years (2.9%) age group with 3.5% among males, and 0.6% in females (Table 6). Result shows that there was a significant (p < 0.05) difference between the sex of the participant and the prevalence of co- infection in the age group.

### Hematological profiles

Analysis of haematological profile showed that a total of 41.6, 37.6 and 50% among helminth infected, bacteria infected and co-infected participants respectively were lymphocytotic that is, they had high lymphocyte count (lymphocytes above 7,000/ml for 5 to 12 years and lymphocytes above 4,000 for ≥ 13 years) (Table 7). Analysis of the haematological profile (lymphocyte) among co-infected and uninfected participants showed that there was no significant difference (p >0.05) (Table 8).

## DISCUSSION

The prevalence data observed revealed the prevalence of helminthiasis in the study area as 36%; this is similar to a study carried out in rural areas of southern China where the prevalence of soil transmitted helminths was 36.7% (Shang et al., 2010). Majority of the infections found among the study population were caused by *A. lumbricoides* and was most prevalent among the 5 to 9 years age group (32.2%), a result similar to the study by Ugbomoiko et al. (2006) in Oba-ile community of Osun state. This could be attributed to indiscriminate defecation and poor hygiene of the children. Hookworm was most prevalent among the ≥ 15 years age group (12.9%). This was close to the observation made by Foghi et al. (2011), in Niger Delta Nigeria who registered that hookworm was more prevalent in the 14 to 16 age group. This could be due to exposure to outdoor activities, poor living conditions and poor hygiene.

Intensity data showed that 15.1% of 28.7% of subjects infected with *A. lumbricoides* had high helminthic load, and 10% of 6.7% infected with hookworm had heavy intensity of infection. World Health Organisations (WHO) guidelines recommend periodic deworming of children with high intensity infections of 10% and above, regardless of the prevalence rate of helminthic infections.

It was observed that 50% of the children who were

**Table 1**. Prevalence of helminth infection in school aged children.

| Age group (years) | Gender | No. examined | No. Infected (%) | *Ascaris lumbricoides* (%) | Hookworm (%) | *S. stercoralis* | Mixed infection |
|---|---|---|---|---|---|---|---|
| 5-9 | Male | 26 | 6 (23.1) | 6 (23.1) | 0 (0) | 0 (0) | 0 (0) |
| | Female | 33 | 14 (42.4) | 13 (39.4) | 1 (3) | 0 (0) | 2 (6.1) |
| 10-14 | Male | 99 | 38 (38.4) | 29 (29.3) | 9 (9.1) | 0 (0) | 4 (4.0) |
| | Female | 111 | 40 (36.1) | 33 (29.7) | 6 (5.4) | 1 (1) | 2 (1.8) |
| ≥ 15 | Male | 18 | 8 (44.4) | 4 (22.2) | 3 (16.7) | 1 (5.6) | 2 (11.1) |
| | Female | 13 | 2 (15.4) | 1 (7.7) | 1 (7.7) | 0 (0) | 0 (0) |
| Total | Male | 143 | 52 (36.4) | 39 (27.3) | 12 (8.4) | 1 (0.7) | 6 (4.2) |
| | Female | 157 | 56 (35.7) | 47 (29.9) | 8 (5.1) | 1 (0.6) | 4 (2.6) |
| | Total | 300 | 108 (36) | 86 (28.7) | 20 (6.7) | 2 (0.7) | 10 (3.3) |

**Table 2.** Prevalence in relation to helminth infection and gender of school aged children.

| Gender | *A. lumbricoides* (%) | Hookworm (%) | *S. stercoralis* (%) | P-value |
|---|---|---|---|---|
| Male | 39 (45.3) | 12 (60.0) | 1 (50.0) | |
| Female | 47 (54.7) | 8 (40.0) | 1 (50.0) | $\chi^2$ =10.10, P = 0.016 |
| Total | 86 (100) | 20 (100) | 2 (100) | |

**Table 3.** Prevalence of helminth infection across all age groups.

| Age group (Years) | *A. lumbricoides* (%) | Hookworm (%) | *S. stercoralis* (%) | P-value |
|---|---|---|---|---|
| 5-9 | 19 (22.1) | 1 (5.0) | 0 (0.0) | |
| 10-14 | 62 (72.1) | 15 (75.0) | 1 (50.0) | $\chi^2$ =0.036, P = 0.491 |
| ≥15 | 5 (5.8) | 4 (20.0) | 1(50.0) | |
| Total | 86 (100) | 20 (100) | 2(100) | |

coinfected had heavy intensity of helminth infection compared with single infected children which was 11.8%. Of the coinfected, 66.7% were found to have heavy growth of the microorganisms causing CSOM when compared with single infection which was 33.3%. Helminth infection causes immunomodulation within the host, there is a skewing of the immune system to Th2 response with widespread anti-inflammatory cytokine network and elevations in interleukin 4 (IL-4), IL-5 and IL-13 (Salgame et al., 2013). This differs from the Th1 mediated inflammatory response (elevated levels of IL-12, IL-23, interferon-γ (IFN-γ) and IL-17) mounted by the immune system in response to bacterial infection

**Table 4.** Prevalence and intensity of helminth in school aged children.

| Helminth | Overall prevalence (%) | Mean epg (±SE) | Intensity (%) |
|---|---|---|---|
| *A. lumbricoides* | 28.7 | 7,755±163.7 | 15.1 |
| Hookworm | 6.7 | 1,142±582 | 10.0 |
| *S. stercoralis* | 0.7 | 321±55 | 0 |

**Table 5.** Prevalence of ear discharge and CSOM in school aged children.

| Age group (years) | Sex | No with ear discharge (%) | No with CSOM (%) |
|---|---|---|---|
|       | Male | 3 (11.5) | 3 (100) |
| 5-9   | Female | 1 (3.0) | 0 (0) |
|       | Total | 4 (6.8 | 3 (75) |
|       | Male | 13 (13.1) | 8 (61.5) |
| 10-14 | Female | 8 (7.2) | 6 (75) |
|       | Total | 21 (10) | 14 (66.7) |
|       | Male | 2 (11.1) | 0 (0) |
| ≥ 15  | Female | 2 (15.4) | 0 (0) |
|       | Total | 4 (13.3) | 0 (0) |
|       | Male | 18 (12.6) | 11 (61.1) |
| Total | Female | 11 (7.0) | 6 (54.5) |
|       | Total | 29 (9.7) | 17 (58.6) |

**Table 6.** Prevalence of ear discharge and bacteria culture in school aged children.

| Age group (years) | Sex | No. with ear discharge (%) | No with positive bacteria culture (%) | p-value |
|---|---|---|---|---|
|       | Male | 5 | 5.1 | |
| 10-14 | Female | 1 | 1.0 | P = 0.0001 |
|       | Total | 6 | 2.9 | |
| Total | Male | 5 | 3.5 | P = 0.044 |
|       | Female | 1 | 0.6 | |

(Gaze et al., 2012). The contrasting effect on the immune system of both types of infection may reflect in impaired inflammatory response to bacterial infection. In addition, helminths also stimulate very strong regulatory cell populations of both innate and adaptive immune systems. These regulatory cells work through other mechanisms different from Th2 cytokines to down-regulate the Th1 mediated inflammatory responses (Salgame et al., 2013). Though the cytokine profile was not assessed in the study population, it is possible that helminth infection in the participants led to impaired Th1 cytokine inflammatory response with reduced clearance of infecting bacteria from the middle ear and subsequent chronic infection. Evidence of intestinal helminth infection modulating co-infection at a distant site was demonstrated in a study where individuals experimentally infected with hookworm *Necator americanus* generated strong systemic Th2 response and regulatory T cell response (Gaze et al., 2012).

Efforts to control CSOM in the study site and probably across subSaharan Africa may need to consider the inclusion of mass deworming. Deworming may enhance strong production of IFN-γ following exposure to bacteria antigens (Salgame et al., 2013), and thus help the immune system of the children in controlling bacteria infection in the middle ear.

**Table 7.** Lymphocyte count in school aged children.

| Age (years) | | Helminth infected (%) | Bacteria infected (%) | Co-infected (%) | Total  (%) |
|---|---|---|---|---|---|
| 5-9 (n=28) | Normal | 14 (50) | 4 (14.3) | 0 (0) | 18 (64.3) |
| | High | 7 (25) | 3 (10.7) | 0 (0) | 10 (35.7) |
| 10-14 (n=96) | Normal | 41(42.7) | 12 (12.5) | 3 (3.1) | 56 (58.3) |
| | High | 30 (31.3) | 7 (7.3) | 3 (3.1) | 40 (41.7) |
| ≥ 15 (n=12) | Normal | 4 (33.3) | 2 (16.7) | 0 (0) | 6 (50) |
| | High | 5 (41.7) | 1(8.3) | 0 (0) | 6 (50) |
| Total | Normal | 59 (54.4) | 18 (62.1) | 3 (50) | 80 (58.8) |
| | High | 42 (41.6) | 11(37.9) | 3 (50) | 56 (41.2) |

The normal range of lymphocyte count in children from 5 to 12 years is between 1,300 and 7,000 cells/,ml; The normal range of lymphocyte count from ≥ 13 is between 1,300 and 4,000 cells/ml.

**Table 8.** Hematological parameters of single and co-infected participants.

| Variable | Uninfected  X± SD | Co-infected X± SD | P-value |
|---|---|---|---|
| PCV | 34.81±2.4 | 34.60±3.3 | P> 0.05 |
| Lymphocyte count | 2,733±855 | 3,999±1267.5 | P > 0.05 |

In the co-infected group, the presence of high prevalence of participants with multiple species of helminth parasites, heavy growth of bacteria (66.7%) and helminth infection (50%) when compared with the single infected group shows that co-infection can lead to high susceptibility to other infections.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

# Service availability and readiness assessment of maternal and child health services using the WHO tool in Kapasia and Sreepur Upazila of Gazipur District in Bangladesh

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The world is making significant progress in reducing the number of women and children dying from preventable causes. Bangladesh is also on track. The objective of this study was to strengthen maternal and child health service delivery in Kapasia and Sreepur Upazila of Gazipur district using SARA tool. The present assessment was a cross-sectional quantitative assessment. This evaluation was performed between January 2015 and December 2015. A sample of 50 health facilities was randomly evaluated. Sixty-two percent of all facilities (n = 50) in the study area were ready to provide general services such as basic services, basic equipment, standard precautions for infection prevention and diagnostic capacity, and essential medicines for patients. The family planning readiness score was 84%, but the antenatal service readiness score was 53% (n = 36). The basic preparation score for emergency obstetric care was 66% among facilities providing delivery services (n = 16). It should be noted that no health center had all the items available for basic obstetric care. Among all health facilities (n = 50), only 28% of health facilities had a full obstetric care service. The child immunization readiness score for Kapasia and Sreepur was 82%; however, only 4% of the facilities had all the trace elements available for child immunization services (n = 36). The total availability of services and the availability of health facilities to provide maternal and child health services did not reach the level necessary to meet future goals. Problems were identified and should be addressed accordingly. A large-scale census survey of all facilities in the study area would provide a better understanding of service availability and readiness.

**Key words:** Service availability, service readiness, maternal and child health services, Bangladesh health system, SARA tool.

## INTRODUCTION

In 2015, there were about 45% of deaths among children under five during their first month of life around the world.

17,000 fewer children die every day from 1990, but still, more than six million children die before their fifth birthday each year. Although, global progress is determined, an increasing proportion of child mortality is found in sub-Saharan Africa and South Asia. Four out of five deaths among children under five occur in these areas. Children born in poverty, almost twice as likely to die before their fifth birthday as children of wealthier families. Children of mothers, including educated mothers with only primary education, are more likely to survive than children of uneducated mothers (Health-United Nations Sustainable Development, 2017).

Worldwide, maternal mortality has declined by 50% since 1990. In East Asia, North Africa and South Asia, the maternal mortality rate has declined by two-thirds. But the ratio of maternal mortality, the proportion of mothers who do not survive childbirth compared with those who do - in developing regions is still 14 times higher than in developed regions. More women receive antenatal care. In developing regions, increased antenatal care rose from 65% in 1990 to 83% in 2012, and only half of women in developing regions receive the amount of recommended medical care they need. Fewer teenagers involve children in most developing regions, but progress has declined. The large increase in contraceptive use in the 1990s did not come together in the 2000s. Slow to meet the need for family planning is greater than the number of women, but demand is growing at a rapid pace (Health-United Nations Sustainable Development, 2017).

Women and children around the world die from preventable causes and have declined considerably over the years. In Bangladesh, the maternal mortality ratio (MMR) is 176 deaths per 100,000 live births, which show a decline of 69.1% in 25 years between 1990 and 2015 (WHO, 2015a). Demographic and health data show that neonatal mortality is 28 per 1,000 live births; the infant mortality rate is 38 per 1,000 live births; the under-five mortality rate (U5MR) is 46 per 1,000 live births and the infant mortality rate is 8 per 1,000 children (NIPORT et al., 2015). In Bangladesh, the infant mortality rate (U5MR) is 38 per 1,000 live births in 2015 and in 1990 it was 144 per 1,000 live births. The annual reduction rate (ARR) is 5.4% (WHO, 2015b).

The World Health Organization (WHO) has formed the Committee on Information and Accountability for Women's and Children's Health (COIA) and includes leaders and experts from Member States and multiple agencies and the health of the parties, academia, civil society and the private sector. The committee focuses on the accountability framework, which includes three interrelated processes that oversee, review and act (WHO, 2011).

Many countries, including Bangladesh, already have some sort of monitoring system in place. However, most of the monitoring system is not coordinated. Different donors have different monitoring frameworks that create a problem. For this reason, WHO developed a framework for follow-up and review called the Service Availability and Readiness Assessment (SARA) "(WHO/SARA, 2015)".

Information on the supply and quality of health services is necessary for the management, monitoring and evaluation of health systems. With the increasing demand for accountability and the need to demonstrate results at the national and global levels, information is needed to track how health systems respond to increased inputs and improved processes over time and the impact that such inputs and processes have to improve health outcomes.

The basic framework of SARA is to strengthen the common ground for monitoring, evaluation and review of the National Health System. SARA was designed to serve as a systematic tool to support annual data verification and service delivery at the facility level. SARA-based data provide evidence on the progress of the health system to inform the annual health sector review and identify gaps and weaknesses in the sub-optimization of service delivery and intervention coverage that should be addressed and provide a basis for planning and monitoring intervention on the scale and service to improve delivery. In Bangladesh, very few evaluations are still in place to monitor, review and evaluate the delivery of maternal health services for children using the SARA tool. Therefore, the present study aims to enter SARA to improve the monitoring and evaluation of the provision of health services for mothers and children in the rural community of Gazipur district, Bangladesh.

**MATERIALS AND METHODS**

Two Upazila (Kapasia and Sreepur) of Gazipur district was considered as our evaluation area. Kapasia Upazila covers an area of 236.75 km$^2$ with a population of 353,160 inhabitants. There are 71,896 households in this Upazila and the population density is 1491 per square kilometre. There are 11 unions in Kapasia Upazila (Local Health Bulletin, 2015). Sreepur Upazila covers an area of 462.00 km$^2$ with a population of 547,795 inhabitants. There are 118,549 households in this Upazila and population density is 1186 per square kilometre. There are 9 unions in Sreepur Upazila (Local Health Bulletin, 2015). This study was a cross-sectional quantitative evaluation. The study was divided into two parts: service availability (SA) and service readiness (SR). This evaluation was carried out between January 1, 2015 and December 31, 2015. Different types of health facilities included in the study were public health facilities: Upazila Health Complex (UHC), Union Sub-centers (USC), Community Clinic (CC) and Private Clinic (PC). At first, the sampling frame of both Upazilas including public and private facilities was carried out. Stratified random sampling was then performed. This study included private clinics with inpatient and outpatient departments. A total of 50 health centers were visited, of Community Clinic (CC) and Private Clinic (PC). At first, the sampling frame of both Upazilas including public and private facilities was carried out. Stratified random sampling was then performed. This study included private clinics with inpatient and outpatient departments. A total of 50 health centers were visited, of which 25 were from Kapasia and 25 were from Sreepur. 50 of these facilities, there are 2 health complex Upazila, 4 union sub-centers, 30 community clinics and 14 private clinics. The principal investigator along with two research assistants spent a full day

evaluating each of the health centers. The administrative head of each health center was interviewed thoroughly. As an example, Upazila Health and Family Planning Officer (UH & FPO) was interviewed at the UHC and the Community Health Services Provider (CHCP) was interviewed at CC. The data were collected during two months from April 1 to May 31, 2015 through a paper based questionnaire.

**Data collection technique**

Questions related to the various health services were asked in detail when necessary. For example, in the Upazila Health Complex, the EPI technician was asked about the carrier of the vaccine and the temperature control of the refrigerator, while the trader was asked about the availability and depletion of the medications. At the community clinic, CHCP was asked about antenatal care and family welfare assistant (FWA) also asked for information about family planning services. Data collected at community clinics and subcenters were verified at the Upazila Health Complex with a statistician who is responsible for entering data into District Health Information System-2 (DHIS-2) software.

**Data entry and quality assurance**

Prior to the official data collection, the questionnaire was modified according to the supervisor's direction and the SARA guideline. To ensure the quality of the data, the research team performed a demonstration at the Gazipur Sadar Upazila Health Complex. The data collectors were trained in two phases to ensure the quality of data collection, firstly before the pretest to define and how to use the tools, and secondly, immediately before the main survey on the basis of field experience. The principal investigator re-examines the data at various control points of data collection, data entry, and data cleaning. Data ware entered into Microsoft Excel directly by data collectors after data collection, helping to protect them from error. Coding was performed. All questionnaires were kept in a safe place to ensure confidentiality. Only the principal investigator has access to these questionnaires for cross-checking or validation of the data, if necessary. The data were analyzed using Microsoft Excel, version 2013.

**Brief description of assessment tool**

SARA is a tool to evaluate health facilities designed to evaluate and monitor the availability of health service and preparedness and generate evidence to support planning and management of the health system. SARA has also been designed to create a systematic set of indicators to track the availability and preparation of the service. The objective of the study was to obtain reliable and regular information on service delivery such as availability of human resources and basic infrastructure, availability of basic equipment, basic facilities, essential medicines, diagnostic capabilities and specific health services like basic health care interventions, family planning, child health services, basic and comprehensive emergency obstetric care. For the evaluation of the facilities, a modified version of the WHO recommended SARA tool was used.

**RESULTS**

The SARA survey is designed to generate a set of basic indicators on key inputs and outputs of the health system that can be used to measure progress in strengthening the health system over time. The tracer indicators are intended to provide objective information on whether or not an installation meets the conditions required to support the provision of basic or specific services with a consistent level of quality and quantity. Summary or composite indicators, also called indexes, can be used to summarize and communicate information on multiple indicators and indicator domains. Indexes can be used for general availability and service-specific availability.

The general services include basic services, basic equipment, standard precautions for infection prevention, diagnostic capacity and essential drugs. The tracer indicators for basic services are the energy source, improved water source within 500 m of the facility, consultation room with auditory and visual privacy for patient consultations, access to adequate sanitation facilities for clients, communication equipment (Telephone/Mobile phone or SW radio), internet access and emergency transport. Plotter indicators for basic equipment are adult scale, child scale, thermometer, stethoscope, blood pressure apparatus and light source. The follow-up indicators for standard precautions for infection prevention are the safe final disposal of sharps, safe final disposal of infectious waste, appropriate storage of sharp residues, adequate storage of infectious waste, disinfectant, single use-disposable or disposable syringes water or alcohol-based hand rub, latex gloves and guidelines for standard precautions. The traceability indicators for the diagnostic capacity are hemoglobin, glycaemia, diagnostic ability of malaria, urine dipstick-glucose, the diagnostic capacity of HIV, rapid syphilis test and urine test for pregnancy. Follow-up indicators for essential drugs are amitriptyline compressed, amoxicillin suspension, amoxicillin tablets, ampicillin injection, gentamicin injection, ceftriaxone injection, salbutamol inhaler, beclomethasone inhaler, enalapril tablet or alternative ACE inhibitor, glibenclamide tablet, metformin tablet, regular insulin, omeprazole or alternative tablet, oral rehydration solution, paracetamol tablet, zinc sulfate tablet, ibuprofen tablet and fluoxetine tablet.

The general service readiness index for Kapasia and Sreepur Upazila was 62% where the highest contributor was basic equipment domain (89%) and the lowest was the diagnostic capacity (36%) of all health facilities (Figure 1). Tracer items for essential medicines were the lowest in CC (17%). USC was not yet ready for providing any diagnostic test (0%) (Figure 2). Specific services include family planning services, antenatal care services, basic obstetric care services, comprehensive obstetric care services, child immunization services, and preventive and curative care services for children. Follow-up indicators for the availability of family planning services are combined oral contraceptive pills, progestin contraceptive pills, combined injectable contraceptives, combined progestin-injectable contraceptives, intrauterine contraceptive device implants, cycle beads for the standard day method, emergency contraceptive
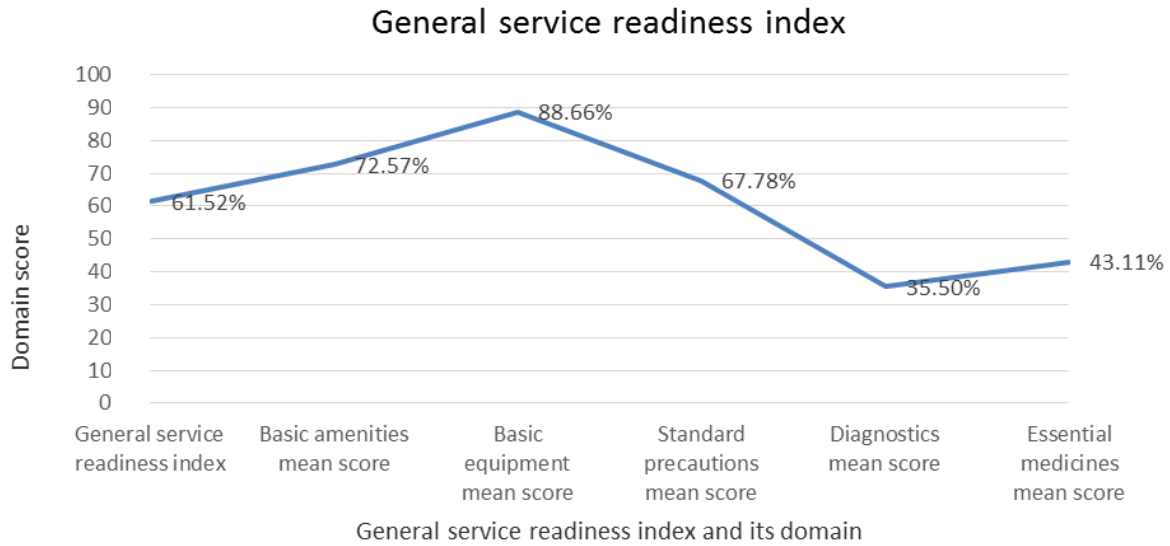
**Figure 1.** General service readiness index and domain scores (n=50).
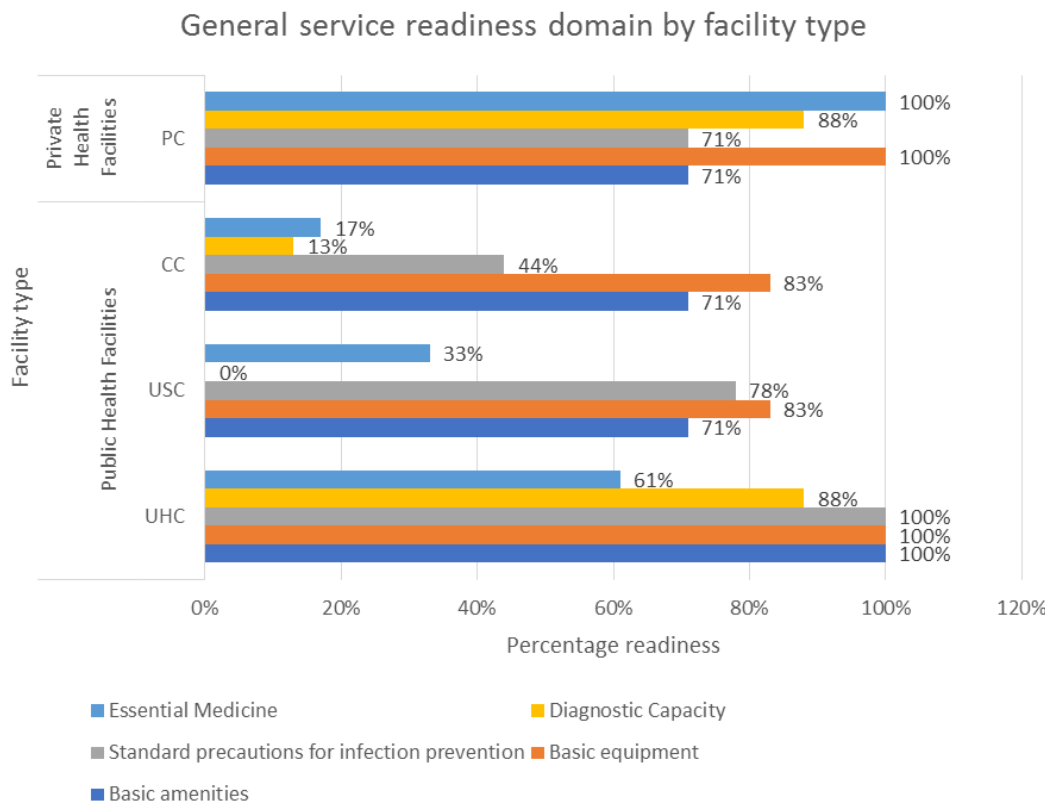


**Figure 2.** General service readiness domain by facility type (n=50).

pills, male sterilization, female sterilization, male condoms and female condoms. Follow-up indicators for the preparation of family planning services are trained personnel and guidelines on family planning, trained

family planning personnel in the last two years; blood pressure equipment and apparatus; medications and commodities-combined oral contraceptive pills, injectable contraceptives and condoms. The follow-up indicators for

the availability of antenatal care services are iron supplementation, folic acid supplementation, intermittent preventive treatment (IPT) for malaria, tetanus toxoid vaccination, monitoring of hypertensive pregnancy disorder and supply of misoprostol tablets for births at home. The follow-up indicators for the preparation of prenatal care services are guidelines on antenatal care (ANC), staff trained in the ANC in the last two years; equipment-blood pressure apparatus; diagnosis: hemoglobin, urine strip protein; medicines and commodities-iron pills, folic acid tablets. Tracer indicators for the availability of basic obstetric care services are the parenteral administration of antibiotics, parenteral administration of oxytocin, parenteral administration of anticonvulsants, and assisted vaginal delivery. Follow-up indicators for the preparation of basic obstetric care services are trained personnel and guidelines for the integrated management of pregnancy and childbirth (IMPAC), staff trained in IMPAC in the last two years; emergency transport equipment, sterilization equipment, examination light, delivery container, suction device (mucus extractor), manual vacuum extractor, vacuum cleaner or D & C kit, neonatal bag and mask, delivery bed, partograph, gloves, blood pressure apparatus; medications and commodities: antibiotic ointment for the newborn, uterotonic injectable, injectable antibiotic, magnesium sulfate (injectable), diazepam (injectable), skin disinfectant, infusion intravenous solution. Follow-up indicators for the full availability of obstetric care services are the cesarean section, blood transfusion, and basic emergency obstetric care.

The follow-up indicators for the preparation of comprehensive obstetric care services are CEmOC guidelines, CEmOC trained personnel, trained personnel in surgery, trained personnel in anesthesia; equipment-anesthesia equipment, incubator; diagnosis-blood test, cross-matching test; medicines and commodities: sufficiency of blood supply, the safety of blood supply. Indicators for monitoring the availability of child immunization services are routine infant immunization services, routine measles immunization, Routine DPT-Hib-HepB immunization, routine polio vaccination, BCG vaccination, rotavirus immunization and immunization against pneumococcus. Follow-up indicators for the preparation of child immunization services trained staff and guidelines: guidelines for EPI, EPI trained personnel; Equipment- cold box/vaccine carrier with ice packs, refrigerator, sharps container, single use of syringes, vaccination cards; medicines and commodities-measles vaccine, DPT-Hib + HepB vaccine, polio vaccine, BCG vaccine.

Indicators for monitoring the availability of preventive and curative care services for children are curative care for children under 5 years of age, diagnosis and treatment of malnutrition, vitamin A supplements, iron supplements, ORS and zinc supplements, growth monitoring and treatment of pneumonia. Follow-up

indicators for the preparation of preventive and curative health services for children's health are: trained staff and guidelines: guidelines for IMCI, guidelines for growth monitoring, staff trained in IMCI, trained personnel in monitoring growth; equipment-children's and children's scale, length/height measuring equipment, thermometer, stethoscope, growth chart; diagnosis: hemoglobin (Hb), fecal test parasite (general microscopy), diagnostic capacity of malaria; medications and commodities-oral rehydration solution pack, amoxicillin dispersible tablet or syrup, co-trimoxazole syrup/suspension, paracetamol syrup, vitamin A capsules, mebendazole/albendazole tablet, zinc sulfate tablet or syrup.

The line graph shows that only 28% health facility had available comprehensive emergency obstetric care service. Highest service available for child health preventive and curative care (79%) (Figure 3). Public health facilities were not yet to be available for comprehensive emergency obstetric care services. On the other hand, private health facilities had no family planning and child immunization services (Figure 4).

Among the facilities offering maternal and child health services, family planning service readiness score was 84%, child immunization service readiness score was 82%, child health preventive and curative care service readiness score was 79%, basic emergency obstetric care service readiness score was 66%, comprehensive obstetric care service readiness score was 60%, but antenatal care service readiness score (53%) was the lowest among specific service readiness domain (Figure 5).

In case of antenatal care services, though 14% private health facilities had available this services, but they were not yet to ready for providing that services (Figure 6).

## DISCUSSION

For the facility readiness assessment, the 73% basic service domain score indicates that approximately two-thirds of the facilities in the study area had basic amenities including adequate sanitation facilities, privacy room, source of improved water, and 64% had a computer with internet, only 40% (2 UHC, 4 USC and 14 Private Hospitals) had an adequate power source to use them correctly. The overall basic equipment proficiency score of 89% indicates that most health facilities had the necessary equipment to provide services to people. However, using of that equipment was not seen by the study team while health care providers were observed when patients came to look for any service. Only 4% of Kapasia and Sreepur facilities had guidelines that are necessary for standard precautions for infection prevention. This is reflected in their daily practice as well. Although almost 92% of the facilities had adequate storage of infectious and wastes, many said they sent their used needle to the Upazila Health Complex for final

## Specific service availability index
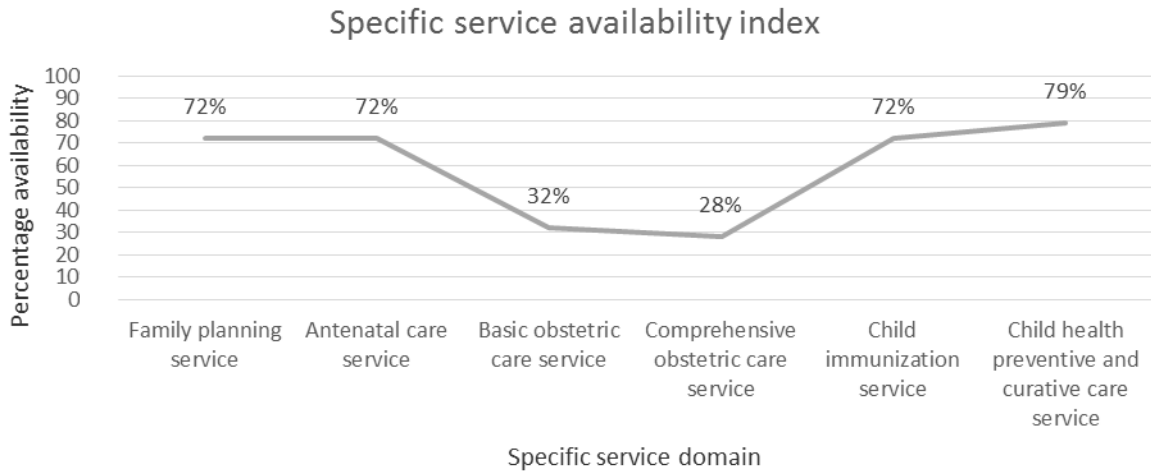


**Figure 3.** Specific service availability (n=50).

## Specific service availability by facility type
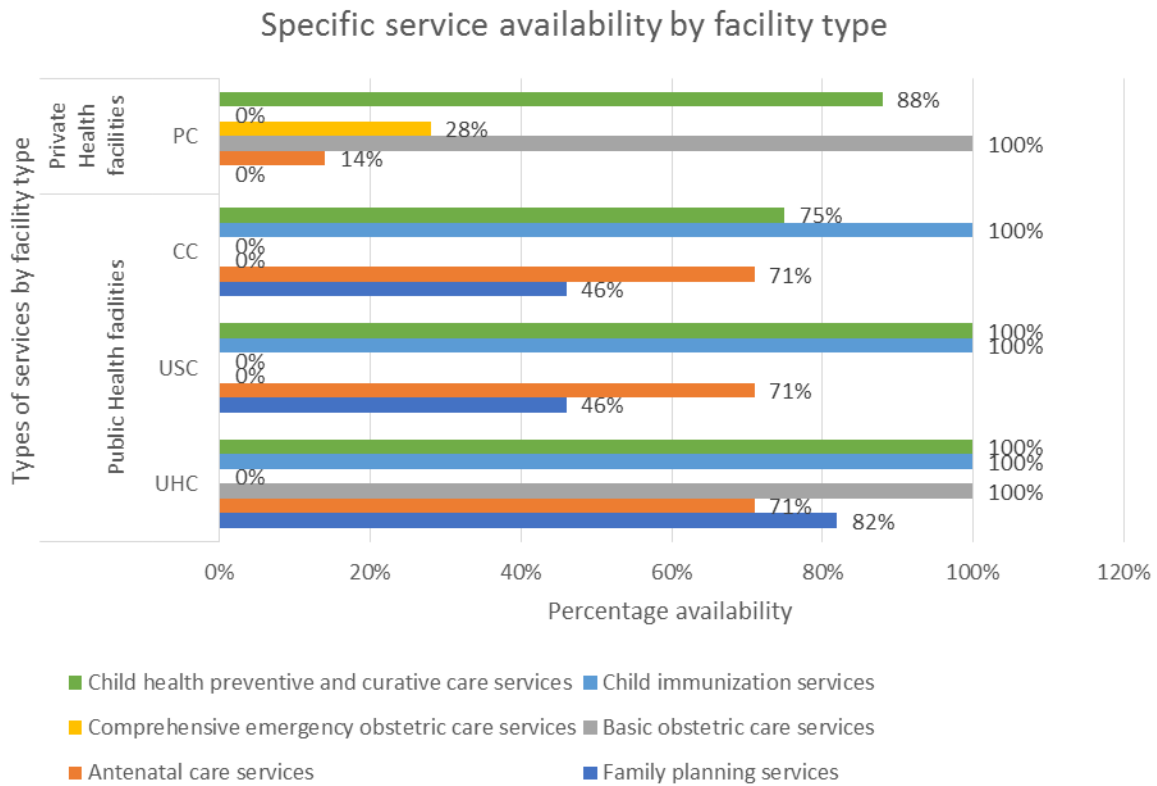


**Figure 4.** Specific service availability by facility type (n=50).

disposal. The overall 43% score for essential medicine indicates that in the current area 43% of facilities had essential drugs. But it is alarming that only 28% had all the essential drugs available at the time of this evaluation. The reason for this shortage was the inadequate supply of medicines by a quarter. At each community clinic in Kapasia Upazila, there was no supply

of any medication during the last three months. However, in some cases, the unnecessary use of medicine by patients can also cause shortages of medications. The patient was happy to receive treatment and the community clinic was known to all people in the community (Karim et al., 2015). CHCP failed to properly answer how many drops make a milliliter (field
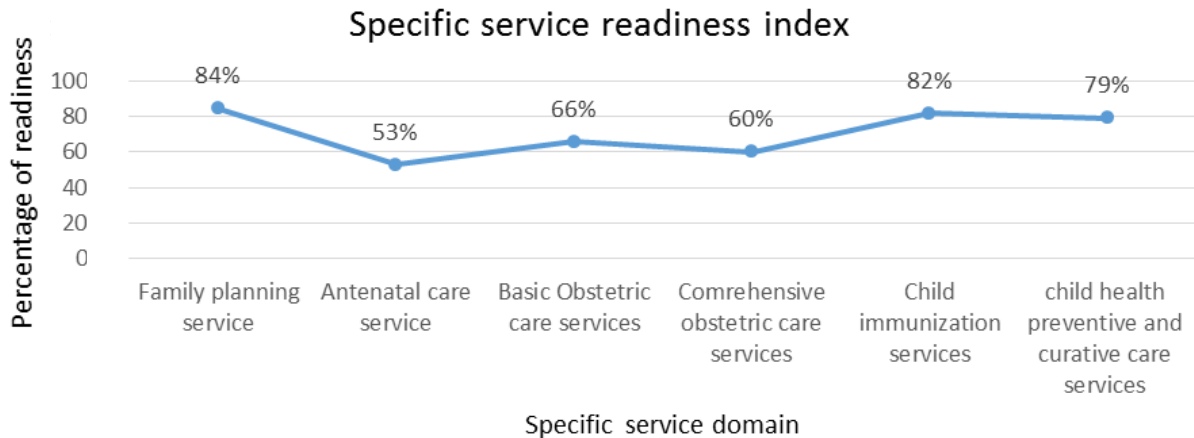
**Figure 5.** Specific service readiness index.
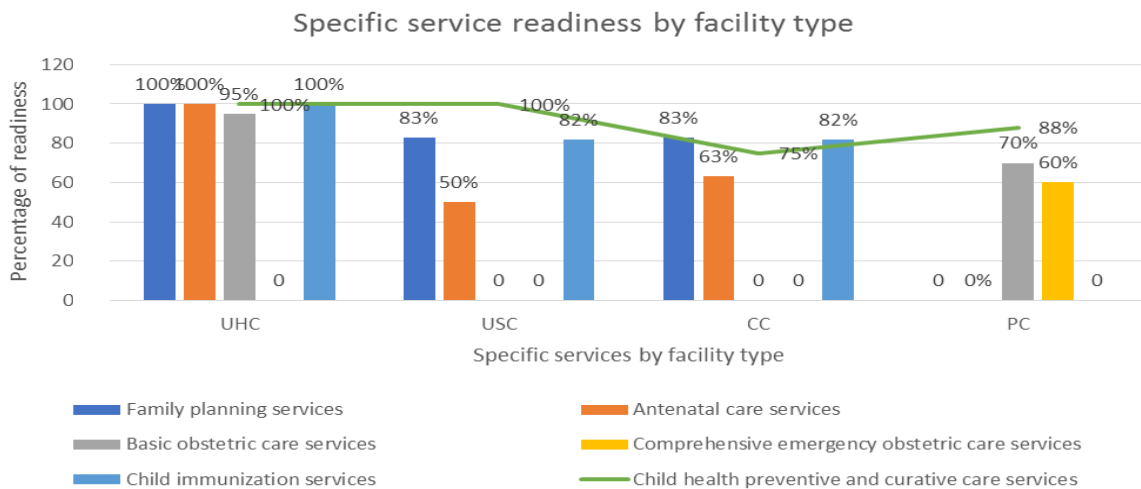


**Figure 6.** Specific service readiness by facility type.

observation). The 62% overall service readiness index score refers to the fact that 62% of all facilities in the study area were ready to provide general services such as basic services, basic equipment, standard precautions for infection prevention and diagnostic capacity and essential medicines to the patients. As only 2 UHC and few private hospital had the diagnostic capability and all basic services, the overall percentage became low.

Family planning readiness score of 84% indicates that almost the facilities had family planning services available (Taylor et al., 1974). The percentage of facilities with all items was very low that is only 6% because we were considering all the services including IUD, implant, sterilization whereas only at UHC all these services were available. But most of our facilities include community clinics where only male condom and pill was available. Child health immunization readiness score was 82%. Child health preventive and curative care readiness score

of 79% indicate that majority of the child got basic preventive care from the facilities. It might contribute to the reduction of child mortality and morbidity of the study area. Though antenatal care service availability score was 72% but readiness score was 53%. Antenatal care service is essential for safe pregnancy outcome (Pervin et al., 2012). No comprehensive emergency obstetric care services were available in any public health facilities. Though in Upazila health complex there were all facilities available for conducting caesarean section except anesthesia facilities.

Different countries in the world like Uganda, Tanzania, Sierra Leone, Zambia, Togo, Niger, Mauritania, Kenya, the Democratic Republic of the Congo, Burkina Faso, and Benin have already adopted SARA tool in their health statistics and information systems.

Though health facilities survey was conducted in Bangladesh (NIPORT et al., 2016), but this study gives a

different dimension emphasizing rural health facilities regarding MCH services considering global standard.

They have to ensure safe motherhood (Ahmed et al., 2012; Rahman et al., 2011; Baqui et al., 1998; Haque et al., 1997). They have achieved MDG 4 within last 25 years. Though, baseline data were very high in comparison to current status. It is undoubtedly a great achievement. But it is quite low in comparison to developed countries. It was the first step. It was very much quantitative rather qualitative improvement. But to reach the future targets, SDG need more emphasis on qualitative improvement, because resources are always limited. It is very much true in case of our developing country, Bangladesh. Our journey is 30 years long journey.

They have the budgetary constraint, lack of proper implementation of health policy and in need, but have to go a long distance to achieve our targets. So our monitoring system, should be strengthen with proper utilization of limited resources.

There were some limitations in the evaluation tool. This tool was not validated in our country. Since a sample of health centers in the study area was selected instead of a census of all facilities, the service availability data may not give an accurate measurement. There is need to face some challenges while conducting the evaluation. Some community clinics and union sub-centers are located in areas of difficult access where transportation was not available and the communication system was very poor. Managing time was a tough job because government facilities work until 2.30 p.m.

## Conclusion

The overall availability of services and the readiness of health facilities to provide maternal and child health services did not reach the goal needed to meet future goals. But at the same time, people in the community were also aware of the available services related to maternal and child health services. Therefore, if quality care were maintained it would be fruitful. Problems were identified and should be addressed accordingly. A large-scale census survey of all facilities in the study area would give a better understanding of service availability and readiness.

Treatment should be managed by at least one primary care physician at all levels. Community clinics should be strengthened. Safe home delivery practices can be initiated from community clinics. These may be a better preventive care center. The anesthesiologist must be available at public health facilities at least Upazila health complex. The results shall contribute significantly to the overall improvement in maternal and child health not only in Bangladesh, but also on the global platform. Finally, all these efforts will serve as a catalyst for better health for the future Bangladesh that achieves the goal of sustainable development.

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*Full Length Research Paper*

# Client satisfaction among private wing and regular health care services at Nekemte Referral Hospital, East Wollega Zone, Oromia regional state, Western Ethiopia: A comparative cross-sectional study, 2016

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The level of client satisfaction with the services provided by the hospitals is one critical area that must be assessed continuously. There is the paucity of information on the comparison of the level of client satisfaction from regular and private wing services of public hospitals in Ethiopia. Thus, the current study aims to compare the level of clients' satisfaction in the adult outpatient department among private wing and regular clients and related factors at Nekemte Referral Hospital. Comparative cross-sectional study was conducted from May 20 to June 30, 2016. Data were collected from 406 participants and analyzed using SPSS version 20. Exploratory factor analysis was employed for statistical analysis. The overall client satisfaction was 58.16 and 68.84% at regular and private wing, respectively. Staff services, accessibility of healthcare services, physical facility, provider behaviour, type of visit, travel time, marital status, and educational status and how respondents visited the hospital were found to be independent predictors of client satisfaction. Besides, there was no statistically significant mean overall levels of client satisfaction difference between regular and private wing outpatient department. Hence, the hospital management should work towards improving staff services, accessibility of health services, physical facility, and provider behaviour.

**Key words:** Comparative study, client satisfaction, regular client, private wing, Nekemte Referral Hospital.

## INTRODUCTION

The measure and management of patient satisfaction have become a top priority at health systems across countries (API Healthcare Corporation and GE Healthcare Company, 2015). Measuring and managing client or patient satisfaction have become an integral part of hospital management strategies across the globe. In most countries, measuring the level of client satisfaction on regular basis are used in quality assurance and

accreditation process (Guide to measuring Client satisfaction, 2000). To meet the ever-increasing needs and demands of their patient population, healthcare industries like hospitals are shifting their views from considering the patient as uneducated who chose the least healthcare to recognize them as an educated consumer, those demanding many services with having healthcare choices (Howard, 2000).

A working definition of patient satisfaction is the degree to which the patient's desires, expectations, goals and/or preferences are met by the healthcare provider and/or services (Debono and Travaglia, 2009). It is also defined as an expression of the gap between the expected and actual provision of a service. It is a component of healthcare quality which is increasingly being used to assess medical care in many countries of the world. Satisfaction is a subjective phenomenon and could be elicited by simply asking whether the patients are satisfied or not by the service delivery (Peter, 2004).

Many African countries are undergoing civil and public service reforms as well as health sector reform. These involve the restructuring of the sector and the creation of new systems, procedures, and functions that are expected to promote efficiency and responsiveness (Dan, 2006). In June 1998, the Ethiopian Federal Ministry of Health (FMOH) launched successive health financing reform. One of the outcomes of the reform was the establishment of private wing (PW) facilities inside the premises of public hospitals starting from 2008 with an objective of improving health workers' retention, providing alternatives and choices to private health service users, and generating additional income for health facilities. This program has benefited a number of patients who have rare access to high-level medical services (Caitlin and Nirali, 2013). PW is established both at hospitals and health centers for providing services to those who can afford to pay more for those services. It is meant for regular improvement of quality services and timeliness of service, especially on weekends (Ethiopia Health Sector Financing Reform Midterm Project Evaluation, 2011). Measuring client satisfaction is desirable for any service delivery organization because it provides invaluable insight into clients' intentions to revisit a service (Caitlin and Nirali, 2013). In health service organization, studies indicated that a satisfied client/patient has complied with the medical treatment prescribed, provider recommendation delivered, and continually using medical services at a specific health provider. This in turn, could result in enhanced disease healing process, healthier and happier patients who can contribute to the development of the country (Ofili and Ofovwe, 2005; Andaleeb et al., 2007; Patavegar et al., 2012).

Hence, the level of patient satisfaction towards the services provided by the hospital is the critical area that must be assessed continuously (Institute NBr, 1982). The data gathered through measuring patient satisfaction reflects care delivered by staff and physicians. It can also serve as a tool in decision-making Linda and MSIPT

(2001). Various studies indicated that the patient's dissatisfaction factors includes: overcrowding, cost of treatment, lack of drugs and supplies, physical environment (cleanliness of toilet and examination rooms), courtesy and respect, waiting time, provision of information about hospital services, maintenance of privacy, difficulty to locate different sections, laboratory procedures and re-visiting of the Doctor for evaluation with laboratory results (Gary, 1998; Olijera and Gebresilasses, 2001; Mitike et al., 2002; Girmay, 2006; Abdosh, 2006; Birhanu et al., 2010; Agumas et al., 2014; Gamo et al., 2015; Iliyasu et al., 2010; Mezemir et al., 2014; Assefa et al., 2014; Assefa et al., 2011).

At the private wing, the patients have the opportunity to choose their own health personnel, especially doctors. They are also expected to be satisfied by the improved services given at this unit than the regular outpatient. Consequently, a private wing outpatient department (PWOPD) is giving service for the community at Nekemte Referral hospital currently. In this hospital, there is a paucity of information on the level of client satisfaction who attends adult outpatient departments of both regular and private wing clients. Thus, the aim of this study was to compare the level of clients' satisfaction with the healthcare service delivery at adult outpatient departments among private wing and regular clients'.

## MATERIALS AND METHODS

The study was conducted from May 20 to June 30, 2016 in Nekemte Referral Hospital, which was established in 1932 by Swedish Missionaries at Oromia regional state, West Ethiopia. During the study period, it was the only government-run hospital serving as a referral center in Western part of Ethiopia for more than 2.5 million people. There were 168 different technical and 84 non-technical staffs. Besides, the hospital had 178 beds (A printed information gained from the Hospital service (Unpublished), 2015). The hospital-based comparative cross-sectional study was conducted on 271 and 135 clients attending regular and private wing OPD services, respectively.

The required sample size was determined by using two population proportion formula based on the assumptions that α (level of significance) 5% = 1.96 and β (the probability of getting a significant result) 80% = 0.842. In addition, P1 (the proportion of client/patient satisfaction in private wing) is 72.7% (Fasika, 2013) while P2 (the proportion of client/patient satisfaction in regular) is 57.7% (Mezemir et al., 2014). For P1, a 15% difference is assumed between the private wing and regular client satisfaction, because there was no previous study on private wing outpatient department (PWOPD) client satisfaction. On the other hand, d (Marginal error) 5% = 0.05 is assumed while 10% of the calculated sample size was added to compensate non-responses. Then, EPIINFO.7 was used to calculate the sample size based on the aforementioned assumptions. Hence, sample size n1 (for private wing) = 135 and n2 = 271(for regular). Then a total of 406 samples were included in the study through systematic random sampling. All clients (≥ 18 years) attending the adult OPD were included while clients-who were staff of the study hospital (to avoid or minimize response bias,who had mental problems, those that needed emergency attention and unable to respond due to their illness, who would have an appointment for revisit and not finished the entire process to gate services for that day) were not included in this study.

A structured questionnaire was developed for the purpose of data collection after reviewing relevant literature (Patavegar et al., 2012; Girmay, 2006; Agumas et al., 2014; Gamo et al., 2015; Mezemir et al., 2014; Assefa et al., 2014; Assefa et al., 2011; Asma et al., 2008; Mao, 2012). The questionnaire was prepared in English, and then translated into Afaan Oromo and back to English to ensure consistency. Finally, the Afaan Oromo version was used for data collection. Sixty-five (27 questions with different alternatives and 38 Likert type items) were used to achieve the objective of the study. The items with Likert scale type are scored on a 5-point scale ranging from 1- "strongly disagree" to 5- "strongly agree". In addition, trained data collectors, under the supervision of two BSc nurses gathered data through face-to-face interview after the clients received services.

The dependent variable of the study is client satisfaction while the independent variables are socio-demographic characteristics, client's perception concerning healthcare services and accessibility to healthcare services. Each of these three independent variables has their own sub-categories. The socio-demographic characters include sex, age, marital status, education, occupation, monthly family income, residence, religion, client department, and ethnicity. The client's perception concerning healthcare services consists of provider's behavior and services, pharmacist's services, staff's services, privacy and confidentiality, availability of services, laboratory and radiological services, physical facilities and type of visit. Accessibility to healthcare services, on the other hand includes distance from the hospital, traveling time, service procedure, waiting time, and cost of care.

Operational definitions: Regular OPD - the unit in the hospital where the medical services are provided to the clients during the work hours, and days (from 8:30 am to 5:30 pm and not included the weekend), Private wing OPD - an extension within a hospital where medical services are provided to clients out of the normal work hours (after 5:30 pm and the weekend), clients who complete entire process-patients who get all services delivered at OPD for which he/she is coming that day and waiting time - the interval between departures from registration for outpatient service and seen by a doctor (That is at waiting station of the private wing and regular OPD).

Data were entered into Epi Data 3.1 and exported to SPSS version 20 for the analysis. Data was cleaned by looking at the distribution of the data, identification of outliers and checking against the original data before final analysis. Next, exploratory factor analysis was done. The appropriateness of the data was checked by using the Kaiser-Meyer Olkin (KMO) for the measure of sampling adequacy (MSA), and Bartlett's test of Sphericity was used before presenting the result of factor analysis.

### Statistical method

Simple linear regression analysis was carried out to identify determinants of outpatient satisfaction. Analysis of variance for comparing responses from the private wing and regular respondents was conducted. A significance level of 0.05 was used in all cases. Overall client satisfaction was measured by taking the average individual clients percentage mean score. KMO of clients' perception about the quality of healthcare service was 0.748 for the regular outpatient department (ROPD) and 0.820 for the private wing outpatient department (PWOPD). Both fulfilled the minimum requirement of 0.50 measure of sampling adequacy and Bartlett's test of sphericity was significant at less than 0.05, indicating a sufficient sample size and appropriate correlation matrix for factor analysis. Factor one, two, three, four and five at the ROPD had 0.915, 0.804, 0.791, 0.736 and 0.701 Cronbach's alpha coefficients, respectively. There is one unrotated factor of satisfaction with 0.978 Cronbach's alpha coefficient. In the case of PWOPD, factor one, two, three, four and five had 0.948, 0.814, 1.00, 0.643 and 0.714

Cronbach's alpha coefficients, respectively which are within the minimum acceptable level of 0.6 (factors noted below). All variables are loaded into five components and named according to the items they contained. So, factor one, two, three, four and five were named as Providers' behaviour, Staff's services, Accessibilities of services, Physical facilities and Availabilities of services at ROPD. On the other hand, the five components loaded at PWOPD are named as Providers' behavior, Physical facilities, Latrine related, Accessibilities of services, and Availabilities of services, respectively. Besides, there is one unrotated factor of satisfaction to the services at both regular and private wing outpatient department which is named as satisfaction.

## RESULTS

### Socio-demographic characteristics of the respondents

A total of 401 (response rate of 98.5%) clients were included in this study, of which 268 were from regular and 133 were from the private wing. The mean age of the respondents at regular and private wing outpatient department is 35.68 (±11.69) and 36.67(±14.50) years, respectively. Most of the respondents are male (61.9% at regular and 55.6% at private wing) (Table 1).

### How respondents visited the hospital and type of visit

More than half (56.0%) respondents from regular outpatient and (59.4%) of private wing client visited the hospital by their personal decision (Table 2).

### Type of client visit at the hospital

There are two types of client visit at the hospital - new and repeat visitors. In the PWOPD, the variation between the repeat and the new client is 47.4% while it is only 4.4% in the case of ROPD as it is indicated in the following Figure 1.

### Availabilities of healthcare services and client perception towards them

Among the total respondents, the laboratory test was ordered for 223 (83.2%) and 122 (91.7%) of clients at regular and private wing, respectively (Table 3).

### Information provided by the healthcare workers and clients' perception concerning these services

As shown in Table 4, 247(92.2%) and 130(97.7%) of respondents reported that they have a good dialogue with the outpatient service providers at regular and private wing, respectively. More than three-fourth (78.0%) at

**Table 1.** Socio-demographic characteristics of respondents at adult regular and private wing outpatient department.

| Variables | ROPD (n=268) | PWOPD (n=133) | Total (n=401) |
|---|---|---|---|
| | N (%) | N (%) | N (%) |
| **Sex** | | | |
| *Male* | 166(61.9) | 74(55.6) | 240(59.9) |
| *Female* | 102(38.1) | 59(44.4) | 161(40.1) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Age group** | | | |
| *18-28* | 79(29.5) | 50(37.6) | 129(32.2) |
| *29-39* | 99(36.9) | 31(23.3) | 130(32.4) |
| *40-50* | 69(25.7) | 32(24.1) | 101(25.2) |
| *51 and above* | 21(7.8) | 20(15.0) | 41(10.2) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Marital status** | | | |
| *Single* | 67(25.0) | 38(28.6) | 105(26.2) |
| *Married* | 185(69.0) | 87(65.4) | 272(67.8) |
| *Divorced* | 13(4.9) | 3(2.3) | 16(4.0) |
| *Widowed* | 3(1.1) | 5(3.8) | 8(2.0) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Educational status** | | | |
| *Illiterate/not able to read and write* | 64(23.9) | 28(21.1) | 92(22.9) |
| *Able to read and write* | 10(3.7) | 11(8.3) | 21(5.2) |
| *Grade 1-4* | 21(7.8) | 9(6.8) | 30(7.5) |
| *Grade 5-8* | 28(10.4) | 13(9.8) | 41(10.2) |
| *Grade 9-10* | 58(21.6) | 18(13.5) | 76(19.0) |
| *Grade 11-12* | 15(5.6) | 9(6.8) | 24(6.0) |
| *College or university* | 72(26.9) | 45(33.8) | 117(29.2) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Occupational status** | | | |
| *Government employee* | 48(17.9) | 36(27.1) | 84(20.9) |
| *Private employee* | 39(14.6) | 16(12.0) | 55(13.7) |
| *Farmer* | 70(26.1) | 19(14.3) | 89(22.2) |
| *Merchant* | 39(14.6) | 17(12.8) | 56(14.0) |
| *House wife* | 28(10.4) | 27(20.3) | 55(13.7) |
| *Daily laborer* | 7(2.6) | 2(1.5) | 9(2.2) |
| *No job* | 8(3.0) | 2(1.5) | 10(2.5) |
| *Student* | 29(10.8) | 14(10.5) | 43(10.7) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Religion** | | | |
| *Orthodox Christian* | 87(32.5) | 55(41.4) | 142(35.4) |
| *Protestant* | 125(46.6) | 63(47.4) | 188(46.9) |
| *Muslim* | 41(15.3) | 13(9.8) | 54(13.5) |
| *Catholic* | 14(5.2) | 2(1.5) | 16(4.0) |
| *Wakefata* | 1(0.4) | - | 1(0.2) |
| *Total* | 268(100) | 133(100) | 401(100) |
| **Ethnicity** | | | |
| *Oromo* | 186(69.4) | 92(69.2) | 278(69.3) |

**Table 1.** Contd.

| | | | |
|---|---|---|---|
| Amhara | 59(22.0) | 24(18.0) | 83(20.7) |
| Tigre | 9(3.4) | 7(5.3) | 16(4.0) |
| Gurage | 14(5.2) | 6(4.5) | 20(5.0) |
| Others [β] | - | 4(3.0) | 4(1.0) |
| Total | 268(100) | 133(100) | 401(100) |
| **Residence** | | | |
| Urban | 138(51.5) | 92(69.2) | 230(57.4) |
| Rural | 130(48.5) | 41(30.8) | 171(42.6) |
| Total | 268(100) | 133(100) | 401(100) |
| **Monthly family income (ETB)** | | | |
| 150 and below | 8(3.0) | 5(3.8) | 13(3.2) |
| 151-600 | 80(29.9) | 31(23.3) | 111(27.7) |
| 601-1200 | 64(23.9) | 24(18.0) | 88(21.9) |
| 1201-2500 | 57(21.3) | 13(9.8) | 70(17.5) |
| 2501 and above | 59(22.0) | 60(45.1) | 119(30.0) |
| Total | 268(100) | 133(100) | 401(100) |

β =Wolaita, Kembata, ETB=Ethiopian Birr (21.72ETB=$1USA),*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

**Table 2.** The ways respondents visited the hospital at adult regular and private wing outpatient department.

| Variables | ROPD (n=268) | PWOPD (n=133) | Total (n=401) |
|---|---|---|---|
| | N (%) | N (%) | N (%) |
| **How the respondents visited the hospital** | | | |
| Came after referral | 77(28.7) | 20(15.0) | 97(24.2) |
| Came upon recommendation from friend or relative | 41(15.3) | 34(25.6) | 75(18.7) |
| Came upon personal decision | 150(56.0) | 79(59.4) | 229(57.1) |
| Total | 268(100) | 133(100) | 401(100) |

*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

regular and 121 (90.2%) of clients at private wing said that there was a convenient environment to ask questions the service providers at both outpatient departments.

**Accessibility to healthcare services and clients' perception towards them**

Concerning distance from the hospital, nearly two-third (63.2%) and more than half (51.5%) of respondents came from less than or equal to fifty-kilometer radius for private and regular outpatient department, respectively (Table 5). The cost paid for the services on average is 125 Ethiopian Birrs (ETB) for both regular and private wing. The services cost includes payment for registration, drug, treatment procedures, laboratory investigation, X-ray/ultrasound or any of the combinations by 148(55.2%) and 111(83.5%) of respondents, respectively, and it was rated as expensive by 29.5% of the respondents from

regular and 36.1% of the respondents from private wing (Figure 2). The mean waiting time to see the services provider (physician) was 30.64(±50.52) at regular while 17.97(±21.79) at private wing. Seventy-nine (29.5%) from regular and 44(33.1%) from PWOPD reported short overall waiting time (Figure 3).

**Clients' level of satisfaction with different components of outpatient healthcare services**

At ROPD, provider behavior, staff service, accessibilities of healthcare, physical facility and availabilities of services were extracted after factor analysis was conducted. Among these components, provider behavior explained 33.426% of the variance among the total variance explained by five components, which was 69.977% (Table 6). Regarding the component extracted at PWOPD provider behavior, physical facility, latrine

**Type of Visit**



| | Regular OPD | Private wing OPD |
|---|---|---|
| ■ Repeat | 128 | 35 |
| ■ New | 140 | 98 |
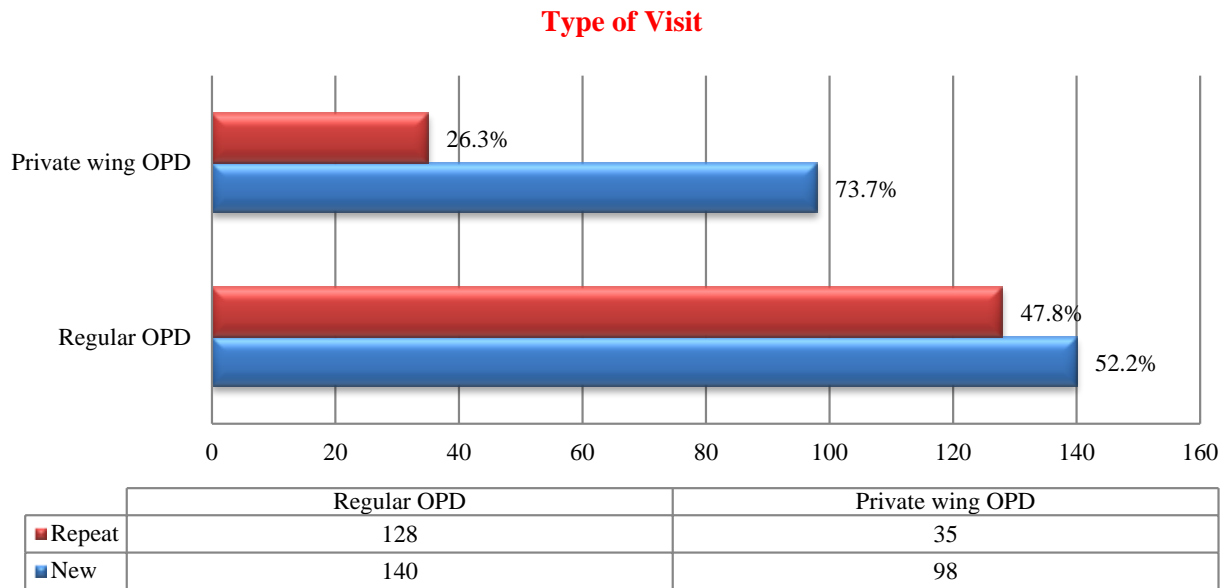
**Figure 1.** Type of clients' visit to regular and private wing outpatient department.

**Table 3.** Availabilities of healthcare services and client perception towards these services.

| S/N | Availability of health services | Client response | ROPD | | PWOPD | |
|---|---|---|---|---|---|---|
| | | | No. | % | No. | % |
| 1 | Whether or not drugs or supplies ordered for the client | Yes | 268 | 100 | 133 | 100 |
| | | No | - | - | - | - |
| | | Total | 268 | 100 | 133 | 100 |
| 2 | Availability of ordered drugs and supplies in the hospital pharmacy | All in all | 125 | 46.6 | 72 | 54.1 |
| | | Some | 117 | 43.7 | 53 | 39.8 |
| | | Not at all | 26 | 9.7 | 9 | 6.0 |
| | | Total | 268 | 100 | 133 | 100 |
| 3 | Whether or not laboratory test(s) ordered for the client | Yes | 223 | 83.2 | 122 | 91.7 |
| | | No | 45 | 16.8 | 11 | 8.3 |
| | | Total | 268 | 100 | 133 | 100 |
| 4 | Availability of ordered laboratory test(s) in the hospital laboratory | All in all | 167 | 74.9 | 102 | 76.7 |
| | | Some | 26 | 11.7 | 9 | 6.8 |
| | | Not at all | 30 | 13.5 | 11 | 8.3 |
| | | Total | 223 | 100 | 122 | 100 |
| 5 | Were any X-ray/Ultrasound procedures ordered for the clients' | Yes | 161 | 60.1 | 84 | 63.2 |
| | | No | 107 | 39.9 | 49 | 36.8 |
| | | Total | 268 | 100 | 133 | 100 |
| 6 | Whether or not the clients' got the ordered procedures in the hospital | All in all | 68 | 42.2 | 39 | 46.4 |
| | | Some | 12 | 7.5 | 19 | 22.6 |
| | | Not at all | 81 | 50.3 | 26 | 31.0 |
| | | Total | 161 | 100 | 84 | 100 |

*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

**Table 4.** Information provided by the healthcare workers and clients' perception concerning these services.

| S/N | Information provided for the client by health worker | Client response | ROPD | | PWOPD | |
|---|---|---|---|---|---|---|
| | | | No. | % | No. | % |
| 1 | Had good dialogue with provider | Yes | 247 | 92.2 | 130 | 97.7 |
| | | No | 21 | 7.8 | 3 | 2.3 |
| | | Total | 268 | 100 | 133 | 100 |
| 2 | The environment was convenient to ask question(s) | Yes | 209 | 78.0 | 120 | 90.2 |
| | | No | 59 | 22.0 | 13 | 9.8 |
| | | Total | 268 | 100 | 133 | 100 |
| 3 | Pharmacy staff explained for them on how to use drugs | Yes | 234 | 96.7 | 122 | 98.4 |
| | | No | 8 | 3.3 | 2 | 1.6 |
| | | Total | 242 | 100 | 124 | 100 |
| 4 | Client privacy and confidentiality during the service procedure | Yes | 258 | 96.3 | 131 | 98.5 |
| | | No | 10 | 3.7 | 2 | 1.5 |
| | | Total | 268 | 100 | 133 | 100 |

*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

**Table 5.** Clients' perception concerning their access to healthcare services.

| Variables | ROPD (n=268) | PWOPD(n=133) | Total(n=401) |
|---|---|---|---|
| | N (%) | N (%) | N (%) |
| **Travel distance from home to hospital** | | | |
| ≤50 km | 138(51.5) | 84(63.2) | 222(55.4) |
| >50 km | 130(48.5) | 49(36.8) | 179(44.6) |
| Total | 268(100) | 133(100) | 401(100) |
| **Travel time in minutes** | | | |
| <60 min | 147(54. 9) | 86(64.7) | 233(58.1) |
| 60-120 min | 45(16.8) | 14(10.5) | 5 9(14.7) |
| 121-240 min | 32(11.9) | 12(9.0) | 44(11.0) |
| >240 min | 44(16.4) | 21(15.8) | 65(16.2) |
| Total | 268(100) | 133(100) | 401(100) |
| **Money paid for services (in ETB)** | | | |
| <100 | 109(40.7) | 16(12.0) | 125(31.2) |
| 100-500 | 148(55.2) | 111(83.5) | 259(64.6) |
| >500 | 11(4.1) | 6(4.5) | 17(4.2) |
| Total | 268(100) | 133(100) | 401(100) |
| **Waiting time to enter OPD (at waiting area)** | | | |
| <15 min | 110(41.0) | 74(55.6) | 184(45.9) |
| 15-30 min | 93(34.7) | 50(37.6) | 143(35.7) |
| 31-60 min | 53(19.8) | 8(6.0) | 61(15.2) |
| 61-90 min | 2(0.7) | - | 2(0.5) |
| >90 min | 10(3.7) | 1(0.8) | 11(2.7) |
| Total | 268(100) | 133(100) | 401(100) |

*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

**Amount of money paid for the services rated as  by the clients**

| | Very Cheap | Cheap | Fair | Expensive | Very Expensive |
|---|---|---|---|---|---|
| ■ Regular OPD | 18 | 60 | 79 | 79 | 32 |
| ■ Private wing OPD | 2 | 23 | 22 | 48 | 38 |
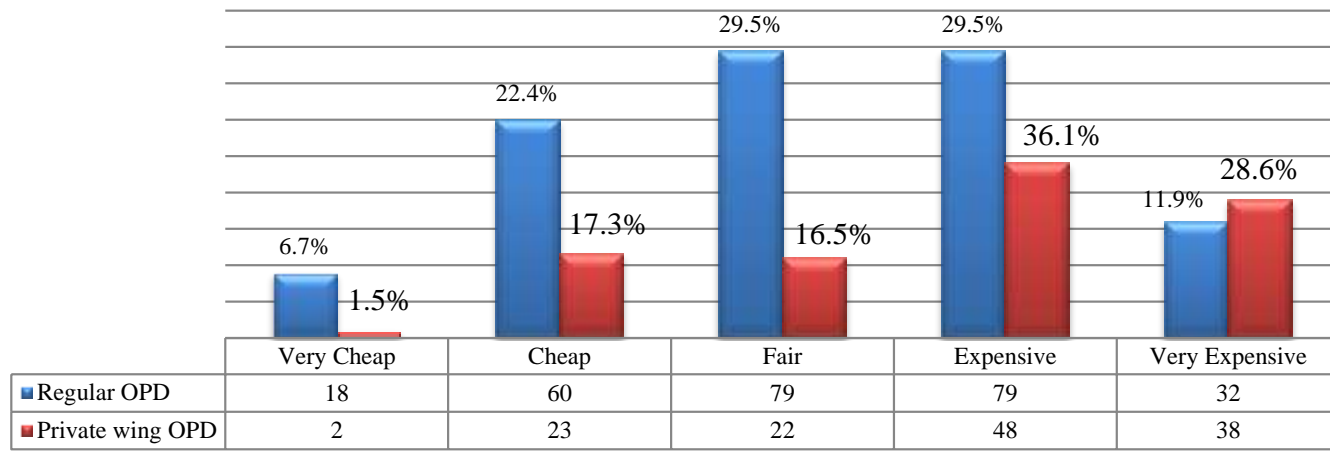
**Figure 2.** Respondent rating of the amount of money paid for services.

**Overall waiting time in the hospital**

| | Very long | Long | Fair | Short | Very short |
|---|---|---|---|---|---|
| ■ Private wing OPD | 9 | 23 | 35 | 44 | 22 |
| ■ Regular OPD | 62 | 55 | 48 | 79 | 24 |
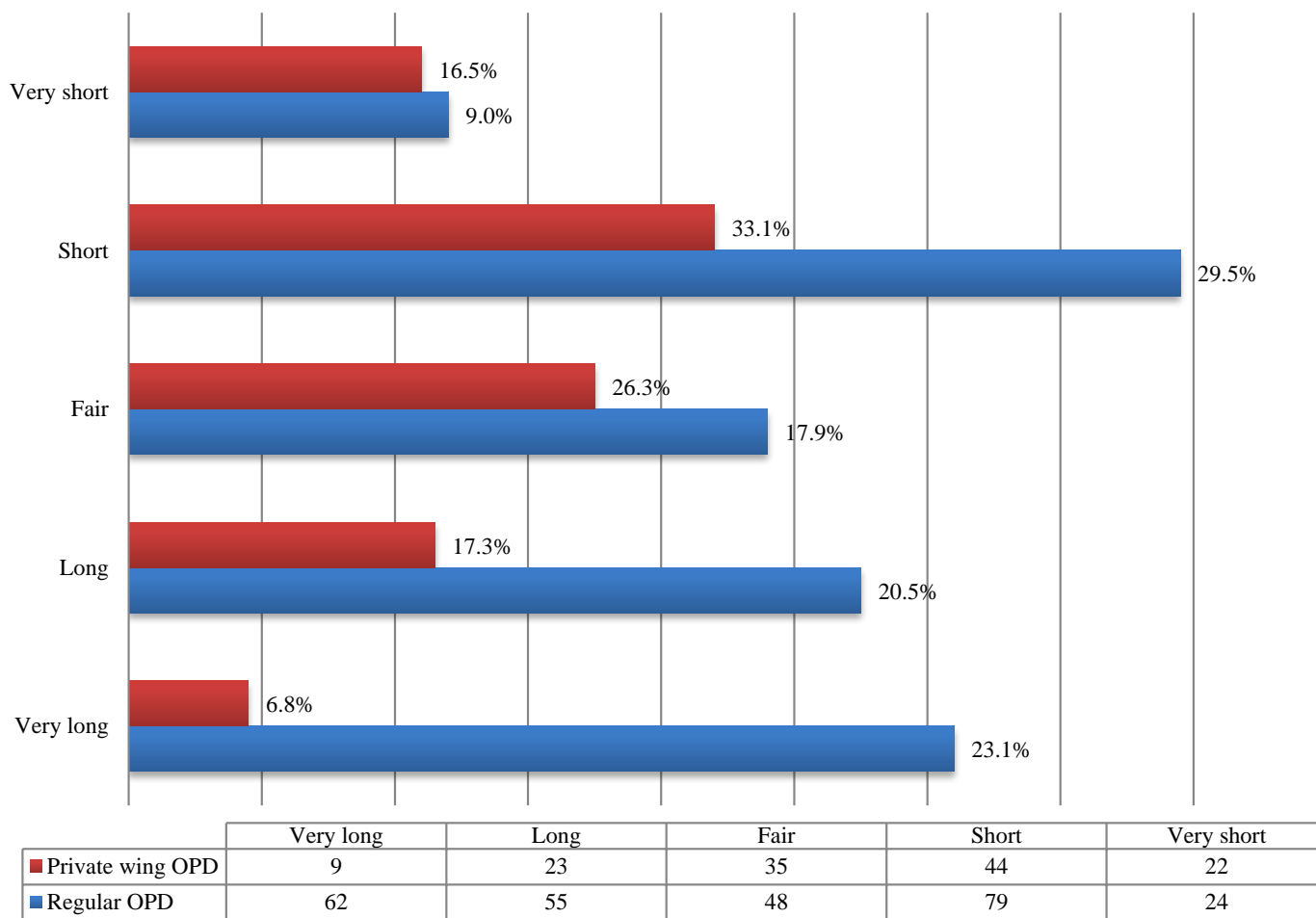
**Figure 3.** Respondent rating of overall waiting time in the hospital during the current visit.

**Table 6.** Results of exploratory factor analysis for ROPD.

| Factor | Factor loading | Variance explained (%) |
|---|---|---|
| **Factor 1: Provider behavior** | | |
| *My doctor treats me in a very friendly and courteous manner* | 0.900 | |
| *Doctors are good to explain how to prevent my disease* | 0.724 | |
| *Doctors are careful to check everything when treating and examining me* | 0.893 | 33.426 |
| *Satisfaction with information provided by Doctor* | 0.918 | |
| *Satisfaction with Nurse services(Courteous and respectful)* | 0.658 | |
| | | |
| **Factor 2: Staff service** | | |
| *I am satisfied by the information provided by all the staff* | 0.717 | |
| *All staffs in this hospital are courteous and respectful during my visit* | 0.784 | 11.839 |
| *Measures taken to assure confidentiality* | 0.645 | |
| *Overall quality of healthcare services in this hospital is good* | 0.642 | |
| | | |
| **Factor 3: Accessibilities of healthcare** | | |
| *Satisfaction with the cost paid for the services* | 0.783 | |
| *The service procedure at this hospital is well coordinate between different department* | 0.810 | 10.452 |
| *The waiting time to get outpatient service after registration(at waiting area)is appropriate for me* | 0.807 | |
| | | |
| **Factor 4: Physical facility** | | |
| *Satisfaction with waiting area sitting chairs* | 0.575 | |
| *Waiting area is clean and neat* | 0.683 | 8.160 |
| *Satisfaction with the cleanliness of Examination room/OPD* | 0.824 | |
| *Satisfaction with the Overall cleanliness of the compound* | 0.820 | |
| | | |
| **Factor 5: Availabilities of services** | | |
| *Availability of drugs and supplies satisfaction* | 0.708 | 6.100 |
| *Pharmacists explain the use of medicine clearly* | -0.845 | |
| | | |
| *Total Variance Explained* | | 69.977 |

related, accessibility to healthcare services and availability of service and information provision were extracted after factor analysis was conducted. From these components, provider behavior explained 36.659% of variance among the total variance explained by five components, which was 73.936% (Table 7).

### Factor 1: Provider behavior

It consisted of 6 items at private wing and 5 items were loaded at ROPD (Tables 6 and 7). With regard to client level of satisfaction toward each item under this factor, for example, more than three-quarter of clients (82.1%) from regular and 117 (88.0%) from private wing said they were satisfied with the information provided by doctor (Tables 8 and 9).

### Factor 2: Staff services at ROPD

This component explained 11.839% of variance among the total variance explained by the five factors. About two-third (63.8%) of clients were satisfied with the information provided by all the staff they contacted. Nearly three-fourth (73.1%) of clients' indicated that the overall quality of healthcare services was good (Table 8).

### Factor 2: Physical facility at PWOPD

Physical facility explained 11.839% of variance from the total variance explained of (73.936%) (Table 7). Most (82.7%) of respondents were satisfied with waiting area sitting chairs and three-fourth of clients' (75.2%) were satisfied with the waiting area cleanliness and neatness (Table 9).

**Table 7.** Results of exploratory factor analysis for PWOPD.

| Factor | Factor loading | Variance explained (%) |
|---|---|---|
| **Factor 1: Provider behavior** | | |
| *Doctors are good to explain how to prevent my disease* | 0.876 | |
| *Satisfaction with information provided by Doctor* | 0.865 | |
| *Satisfaction with information provided by Nurse* | 0.895 | |
| *Satisfaction with Nurse services(Courteous and respectful)* | 0.870 | 36.659 |
| *I am satisfied the way health provider listened to me* | 0.890 | |
| *I am satisfied by the information provided by all the staff* | 0.815 | |
| | | |
| **Factor 2:Physical facility** | | |
| *Adult OPD location is convenient  for you* | 0.794 | |
| *Satisfaction with  waiting area sitting chairs* | 0.883 | |
| *Waiting area is clean and neat* | 0.815 | 11.839 |
| *Satisfaction with the cleanliness of Examination room/OPD* | 0.616 | |
| | | |
| **Factor 3:Latrine related** | | |
| *Satisfaction with the access of the latrine* | 0.983 | 11.095 |
| *Satisfaction with the cleanliness of the latrine* | 0.983 | |
| | | |
| **Factor 4: Accessibility to healthcare services** | | |
| *Satisfaction with the cost paid for the services* | 0.723 | |
| *The waiting time to get outpatient service  after registration (that is at waiting area) is appropriate for me* | 0.705 | 7.708 |
| *Satisfaction with time spent to get services (Over all waiting time)* | 0.747 | |
| | | |
| **Factor 5: Availability of service (that is drugs) and Information provision** | | |
| *Availability of drugs and supplies satisfaction* | 0.718 | |
| *Pharmacists explain the use of medicine clearly* | -0.819 | 6.684 |
| *Total Variance Explained* | | 73.936 |

### Factor 3: Accessibility to healthcare services at ROPD

In factor analysis, only 3 items (cost paid for the services, service procedure and waiting time to enter OPD clinic) were loaded on this factor and it explained 10.452% of variance (Table 6). For example, among those three items, it was found that 12.7, 38.4 and 48.9% of clients were dissatisfied, neutral and satisfied on the amount of money incurred for the services respectively (Table 8).

### Factor 3: Latrine related at PWOPD

Table 7 indicated latrine related factor as one factor that explained 11.095% of variance. Out of the one hundred and fourteen clients' who visited the latrine, more than half (57.0%) were unsatisfied on the accessibility of the latrine (Table 9).

### Factor 4: Physical facility at ROPD

Three items (satisfaction with waiting area  sitting chairs,

cleanliness, and neatness of waiting area as well as cleanliness of examination room) were loaded under this factor which explained 8.160% of the variance at ROPD. Among the total interviewed respondents 45.5% of clients cited as unsatisfied with waiting area sitting chairs (Table 8).

### Factor4: Accessibility to healthcare services at PWOPD

It explained 7.708% of variance from the total variance explained by five factors (Table 7). More than half (76, 57.1%) of clients were unsatisfied with the amount of money paid for the services (Table 9).

### Factor 5: Availabilities of services

This component explained 6.100 and 6.684% of the variance at regular and private wing outpatient department, respectively (Tables 6 and 7). More than one-third (105, 39.2%) and one-third (45, 33.8%) of clients were unsatisfied at both regular  and private wing

**Table 8.** Satisfaction of client with the different components of outpatient healthcare services at ROPD.

| Factor and each items load under them | Perceived client response in number and percentage at ROPD | | | | |
|---|---|---|---|---|---|
| | SDA n(%) | DA n(%) | Neutral n(%) | Agree n(%) | SA n(%) |
| **Factor 1: Provider Behavior** | | | | | |
| *My doctor treats me in a very friendly and courteous manner* | 2(0.7) | 13(4.9) | 21(7.8) | 148(55.2) | 84(31.3) |
| *Doctors are good to explain how to prevent my disease* | 5(1.9) | 46(17.2) | 23(8.6) | 130(48.5) | 64(23.9) |
| *Doctors are careful to check everything when treating and examining me* | 3(1.1) | 17(6.3) | 24(9.0) | 144(53.7) | 80(29.9) |
| *Satisfaction with information provided by Doctor* | 3(1.1) | 20(7.5) | 25(9.3) | 140(52.2) | 80(29.9) |
| *Satisfaction with Nurse services(Courteous and respectful)* | 5(1.9) | 39(14.6) | 39(14.6) | 122(45.5) | 63(23.5) |
| **Factor 2: Staff's Services** | | | | | |
| *I am satisfied by the information provided by all the staff* | 6(2.2) | 27(10.1) | 64(23.9) | 129(48.1) | 42(15.7) |
| *All staffs in this hospital are courteous and respectful during my visit* | 7(2.6) | 28(10.4) | 70(26.1) | 118(44.1) | 45(16.8) |
| *Measures were taken to assure confidentiality* | 1(0.4) | 9(3.4) | 10(3.7) | 148(55.2) | 100(37.3) |
| *Overall quality of healthcare services in this hospital is good* | 2(0.7) | 21(7.8) | 49(18.3) | 141(52.6) | 55(20.5) |
| **Factor 3: Accessibility to health care services** | | | | | |
| *Satisfaction with the cost paid for the services* | 41(15.3) | 62(23.1) | 34(12.7) | 90(33.6) | 41(15.3) |
| *The service procedure at this hospital is well coordinate between different department* | 19(7.1) | 56(20.9) | 31(11.6) | 127(47.4) | 35(13.1) |
| *The waiting time to get outpatient service after registration(at waiting area)is appropriate for me* | 50(18.7) | 54(20.1) | 26(9.7) | 91(34.0) | 47(17.5) |
| **Factor 4: Physical facility** | | | | | |
| *Satisfaction with waiting area sitting chairs* | 28(10.4) | 94(35.1) | 32(11.9) | 83(31.0) | 31(11.6) |
| *Waiting area is clean and neat* | 11(4.1) | 55(20.5) | 66(24.6) | 106(39.6) | 30(11.2) |
| *Satisfaction with the cleanliness of Examination room/OPD* | 4(1.5) | 28(10.4) | 43(16.0) | 123(45.9) | 70(26.1) |
| *Satisfaction with the Overall cleanliness of the compound* | 10(3.7) | 42(15.7) | 94(35.1) | 104(38.8) | 18(6.7) |
| **Factor 5: Availabilities of services and Information provision** | | | | | |
| *Availability of drugs and supplies satisfaction* | 33(12.3) | 72(26.9) | 28(10.4) | 62(23.1) | 73(27.2) |
| *Pharmacists explain the use of medicine clearly(n=250)* | 7(2.8) | 18(7.2) | 13(5.2) | 117(46.8) | 95(38) |

*SDA: Strongly Disagree; DA: Disagree, SA: strongly agree, ROPD: Regular outpatient department, PWOPD: Private outpatient department.

outpatient department, respectively (Tables 8 and 9).

**Overall client satisfaction**

In this study, the overall client satisfaction was measured with four items, in which only one unrotated factor with four items was extracted during the factor analysis at both departments. Clients who utilized private wing outpatient services were more satisfied than those who opted for regular outpatient services in all the four items. By taking mean scores (percentages of maximum scale scores) the overall client satisfaction with outpatient services at ROPD was 58.16%.

The raw mean score client satisfaction was 13.31 ± 4.62 with the possible value range of 4 to

**Table 9.** Satisfaction of client with the different components of outpatient healthcare services at PWOPD.

| Factors with loaded items | Perceived client response in number and percentage at PWOPD | | | | |
|---|---|---|---|---|---|
| | SDA n (%) | DA n(%) | Neutral n(%) | Agree n(%) | SA n(%) |
| **Factor 1: Provider behavior and Staff services** | | | | | |
| *Doctors are good to explain how to prevent my disease* | - | 5(3.8) | 11(8.3) | 58(43.6) | 59(44.4) |
| *Satisfaction with information provided by Doctor* | 1(0.8) | 5(3.8) | 10(7.5) | 59(44.4) | 58(43.6) |
| *Satisfaction with information provided by Nurse* | 2(1.5) | 3(2.3) | 11(8.3) | 54(40.6) | 63(47.4) |
| *Satisfaction with Nurse services(Courteous and respectful)* | 1(0.8) | 3(2.3) | 10(7.5) | 55(41.4) | 64(48.1) |
| *I am satisfied the way health provider listened to me* | 2(1.5) | 3(3.8) | 9(6.8) | 55(41.4) | 64(48.1) |
| *I am satisfied by the information provided by all the staff* | 1(0.8) | 5(3.8) | 12(9.0) | 58(43.6) | 57(42.9) |
| **Factor 2: Physical facility** | | | | | |
| *Adult OPD location is convenient for you* | - | 13(9.8) | 3(2.3) | 53(39.8) | 64(48.1) |
| *Satisfaction with waiting area sitting chairs* | - | 15(11.3) | 8(6.0) | 53(39.8) | 57(42.9) |
| *Waiting area is clean and neat* | 1(0.8) | 15(11.3) | 17(12.8) | 51(38.3) | 49(36.8) |
| *Satisfaction with the cleanliness of Examination room/OPD* | 1(0.8) | 15(11.3) | 17(12.8) | 62(46.6) | 38(28.6) |
| **Factor 3: Latrine related** | | | | | |
| *Satisfaction with the access of the latrine(n=114)* | 14(12.3) | 51(44.7) | 26(22.8) | 15(13.2) | 8(7.0) |
| *Satisfaction with the cleanliness of the latrine(n=114)* | 28(24.6) | 55(48.2) | 11(9.6) | 13(11.4) | 7(6.1) |
| **Factor4: Accessibility to healthcare services** | | | | | |
| *Satisfaction with the cost paid for the services* | 36(27.1) | 40(30.1) | 10(7.5) | 29(21.8) | 18(13.5) |
| *The waiting time to get outpatient service after registration(at waiting area)is appropriate for me* | 3(2.3) | 16(12.0) | 16(12.0) | 59(44.4) | 39(29.3) |
| *Satisfaction with time spent to get services and get back(Over all waiting time)* | 8(6.0) | 22(16.5) | 9(6.8) | 51(38.3) | 43(32.3) |
| **Factor 5: Availability of service (drugs) and Information provision** | | | | | |
| *Availability of drugs and supplies satisfaction* | 10(7.5) | 35(26.3) | 6(4.5) | 28(21.1) | 54(40.6) |
| *Pharmacists explain the use of medicine clearly(n=128)* | 1(0.8) | 6(4.7) | 4(3.1) | 43(33.5) | 74(57.8) |

SDA=Strongly Disagree, DA=Disagree, SA=strongly agree, PWOPD: Private outpatient department.

20, while mean scores (percentages of maximum scale scores) of the overall client satisfaction with outpatient services at PWOPD was 68.84% (Table 10).

**Comparison of client level of satisfaction**

There was no statistically significant difference between the mean overall level of client satisfaction with healthcare services delivered at private wing and regular adult outpatient department (F[1; 399] = 0.000, *p*=1.000).

**Factors affecting client satisfaction:-Socio-demographic characteristics**

Among the socio-demographic variables, only marital status, educational status, and the distance showed statistically significant association at (p<0.05) at the ROPD. Divorced had 0.622 unit greater satisfaction when compared to their married counter parts at (β=0.622, p=0.023, 95%CI=0.086, 1.158). Respondents whose educational level is grade 9 to 10 had 0.280 unit less satisfaction score as compared to college or university at (β =-0.280,

**Table 10.** The responses of clients' to overall satisfaction items with different components at both departments.

| Items | Client department and their response | | | |
| | ROPD | | PWOPD | |
| | No. | % | No. | % |
|---|---|---|---|---|
| **This hospital and its services were according to my expectations** | | | | |
| Strongly disagree | 18 | 6.7 | 1 | 0.8 |
| Disagree | 64 | 23.9 | 21 | 15.8 |
| Neutral | 37 | 13.8 | 16 | 12.0 |
| Agree | 112 | 41.8 | 63 | 47.4 |
| Strongly agree | 37 | 13.8 | 32 | 24.1 |
| | | | | |
| **Willingness/Intention to come back again to the hospital** | | | | |
| Strongly disagree | 20 | 7.5 | 1 | 0.8 |
| Disagree | 65 | 24.3 | 19 | 14.3 |
| Neutral | 30 | 11.2 | 16 | 12.0 |
| Agree | 118 | 44.0 | 70 | 52.6 |
| Strongly agree | 35 | 13.1 | 27 | 20.3 |
| | | | | |
| **Willingness to recommend the hospital to someone else** | | | | |
| Strongly disagree | 21 | 7.8 | 5 | 3.8 |
| Disagree | 62 | 23.1 | 15 | 11.3 |
| Neutral | 35 | 13.1 | 23 | 17.3 |
| Agree | 110 | 41.0 | 61 | 45.9 |
| Strongly agree | 40 | 14.91 | 29 | 21.8 |
| | | | | |
| **I am over all satisfied with the OPD services** | | | | |
| Strongly disagree | 19 | 7.1 | 2 | 1.5 |
| Disagree | 59 | 22.0 | 20 | 15.0 |
| Neutral | 38 | 14.2 | 17 | 12.8 |
| Agree | 112 | 41.8 | 64 | 43.1 |
| Strongly agree | 40 | 14.9 | 30 | 22.6 |
| Overall level of client satisfaction | 58.16% | | 68.84% | |

*ROPD: Regular outpatient department, PWOPD: Private outpatient department.

p=0.048, 95%CI=-0.558, -0.003) (Table 11). At the private wing, only type of visit, the way respondents visited the hospital and travel time showed the statistically significant association.

Accordingly, those who responded as new visitors had0.327 unit greater satisfaction as compared to the repeats (β =0.327, p=0.0001, 95%CI=0.390, 1.390) (Table 12).

**Factors affecting client satisfy: - other than socio-demographic characteristics**

The factors extracted after performing exploratory factor analysis were taken as independent variables. Then, to determine the importance of each factor for client satisfaction at regular and private wing outpatient department in Nekemte referral hospital, the simple linear

regression was conducted and candidate variable having p-value less than 0.25 was selected.

All assumptions of linear regression (that is linearity, normality and multicollinearity) were checked. As has been cited in Table 13, all extracted factors - provider behaviour, Staff services, accessibility of health services, physical facility and availability of services had p-value less than 0.25 and all of them were entered into multivariable linear regression at ROPD. With regard to factors extracted at PWOPD, latrine related, and availability of services and information provision had no significance at p<0.25 and were excluded from multiple regression analysis. At ROPD, accessibility of health services, staff services and physical facility were positively correlated with client satisfaction. While availability of services was negatively correlated (Table 14).

In the case of PWOPD, provider behavior, accessibility

**Table 11.** Socio-demographic determinants of client satisfaction at the ROPD.

| Variables | Frequency | % | β | p-value | 95% CI for β | |
|---|---|---|---|---|---|---|
| | | | | | LB | UB |
| **Marital status** | | | | | | |
| *Single* | 67 | 25 | 0.062 | 0.32 | -0.139 | 0.423 |
| *Married\*\** | 185 | 69 | | | | |
| *Divorced* | 13 | 4.9 | 0.622 | 0.023 | 0.086 | 1.158 |
| *Widowed* | 3 | 1.1 | -0.024 | 0.694 | -1.375 | 0.917 |
| | | | | | | |
| **Educational status** | | | | | | |
| *Not able to read and write* | 64 | 23.9 | -0.032 | 0.664 | -0.416 | 0.265 |
| *Able to read and write* | 10 | 3.7 | 0.022 | 0.907 | -0.233 | 0.262 |
| *Grade 1-4* | 21 | 7.8 | 0.025 | 0.711 | -0.404 | 0. 592 |
| *Grade 5-8* | 28 | 10.4 | -0.003 | 0.963 | -0.46 | 0.438 |
| *Grade 9-10* | 58 | 21.6 | -0.28 | 0.048 | -0.558 | -0.003 |
| *Grade 11-12* | 15 | 5.6 | -0.115 | 0.052 | -1.004 | 0.004 |
| *College or university\*\** | 72 | 26.9 | - | - | - | - |
| | | | | | | |
| **Distance from home to hospital** | | | | | | |
| *<=50 km* | 138 | 51.5 | 0.587 | 0.0001 | 0.358 | 0.747 |
| *>50 km\*\** | 130 | 48.5 | - | - | - | - |

\*\*reference groups, those with high frequency of observations were used.

**Table 12.** The way how client visited the PWOPD.

| Variables | Frequency | % | β | p-value | 95% CI for β | |
|---|---|---|---|---|---|---|
| | | | | | LB | UB |
| **How respondent visited the hospital** | | | | | | |
| *Came after referral* | 20 | 15 | 0.145 | 0.12 | -0.107 | 0.914 |
| *Came upon recommendation from friend or relative* | 34 | 25.6 | 0.232 | 0.006 | 0.156 | 0.905 |
| *Came upon personal decision\*\** | 79 | 59.4 | | | | |
| | | | | | | |
| **Type of visit** | | | | | | |
| *New visit* | 98 | 73.7 | 0.327 | 0.0001 | 0.39 | 1.09 |
| *Repeat visit \*\** | 35 | 26.3 | | | | |
| | | | | | | |
| **Travel time (in minutes)** | | | | | | |
| *<60 minutes* | 86 | 64.7 | 0.281 | 0.147 | -0.183 | 0.945 |
| *60-120 minutes* | 14 | 10.5 | -0.266 | 0.001 | -1.361 | -0.365 |
| *121-240 minutes* | 12 | 9 | 0.215 | 0.09 | -0.118 | 1.611 |
| *>240 minutes\*\** | 21 | 15.8 | | | | |

\*\*reference groups, those with high frequency of observations were used

to healthcare services and Physical facility were positively correlated with client satisfaction (Table 15).

**Predictors of client level of satisfaction at ROPD**

In this study, the percentage mean scale score of provider behavior was found to be 73.41%. This factor entered into the simple linear regression model and explained 17.6% of the variation in the level of client satisfaction, and provider behavior was significantly associated with client satisfaction at p (<0.0001) (0.078, 0.133). The percentage mean scale score of staff services was found to be 66.924% and has an average

**Table 13.** The extracted factors as predictors of Client level of satisfaction with different component of outpatient services at regular and private wing outpatient department.

| Client department | Factors | Unstandardized coefficients | | Standardized coefficients | t | P-value | 95.0%CI for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std.Error | β | | | LB | UB |
| ROPD | Provider behaviour | 0.105 | 0.014 | 0.423 | 7.605 | 0.000 | 0.078 | 0.133 |
| | Staff services | 0.180 | 0.019 | 0.501 | 9.448 | 0.000 | 0.142 | 0.217 |
| | Accessibility of health services | 0.205 | 0.014 | 0.675 | 14.927 | 0.000 | 0.178 | 0.232 |
| | Physical facility | 0.110 | 0.018 | 0.348 | 6.048 | 0.000 | 0.074 | 0.146 |
| | Availability of services | -0.004 | 0.003 | -0.088 | -1.441 | 0.151 | -0.009 | 0.001 |
| PWOPD | Provider behaviour | 0.155 | 0.015 | 0.670 | 10.342 | 0.000 | 0.125 | 0.185 |
| | Physical facility | 0.090 | 0.027 | 0.277 | 3.301 | 0.001 | 0.036 | 0.144 |
| | latrine related | -0.001 | 0.001 | -0.068 | -0.775 | 0.440 | -0.004 | 0.002 |
| | Accessibility to health care services | 0.183 | 0.026 | 0.523 | 7.016 | 0.000 | 0.131 | 0.235 |
| | Availability of services and information provision | -0.001 | 0.005 | -0.014 | -0.163 | 0.871 | -0.011 | 0.009 |

ROPD: Regular outpatient department, PWOPD: Private outpatient department.

**Table 14.** Pearson Correlation of extracted factor with client satisfaction at ROPD.

| Factors extracted | Client satisfaction | Provider behavior | Staff services | Accessibility of health services | Physical facility | Availability of services |
|---|---|---|---|---|---|---|
| Client satisfaction | 1.000 | 0.423 | 0.501 | 0.675 | 0.348 | -0.088 |
| Provider behavior | 0.423 | 1.000 | 0.606 | 0.314 | 0.233 | 0.006 |
| Staff services | 0.501 | 0.606 | 1.000 | 0.348 | 0.288 | -0.112 |
| Accessibility of health services | 0.675 | 0.314 | 0.348 | 1.000 | 0.214 | -0.022 |
| Physical facility | 0.348 | 0.233 | 0.288 | 0.214 | 1.000 | -0.055 |
| Availability of services | -0.088 | 0.006 | -0.112 | -0.022 | -0.055 | 1.000 |

mean raw score of 15.3694 ± 2.78736 with the value range of 6 to 20. This component explained 24.8% variation in client satisfaction among the ROPD and the staff service was significantly associated with client's level of satisfaction at p (0.0001) (0.142 to 0.217). Percentage mean scale score of accessibility of health services to the clients at ROPD in this study was found to be 55.0375% and has an average raw mean score of 9.6045% ± 3.28888 with the value range of 3 to

15. In model, accessibility of healthcare service explained 45.4% variability in level of satisfaction. This factor was significantly associated with the level of satisfaction at p (0.0001) (0.178 to 0.232).

**Predictors of client level of satisfaction at PWOPD**

The percentage mean scale score of provider

behavior was 80.69. In the final model, it explained 44.5% of the variation in the level of client satisfaction and the provider behavior was significantly associated with client satisfaction at p (<0.0001) (0.125, 0.185). The percentage mean scale score of the physical facility was 69.23% and has an average raw mean score of 16.30 ± 3.08756 with the value range of 8 to 20. It explained 45.4% variability in the level of satisfaction. It was significantly and positively

**Table 15.** Pearson Correlation of extracted factor with client satisfaction at PWOPD.

| Components extracted | Client satisfaction | Provider behavior | Physical facility | Accessibility to healthcare services |
|---|---|---|---|---|
| Clients' satisfaction | 1.000 | 0.670 | 0.277 | 0.523 |
| Provider behaviour | 0.670 | 1.000 | 0.346 | 0.319 |
| Physical facility | 0.277 | 0.346 | 1.000 | 0.151 |
| Accessibility to healthcare services | 0.523 | 0.319 | 0.151 | 1.000 |

associated with the level of satisfaction at p (0.001) (0.036 to 0.144). Percentage mean scale score of accessibility of health services to the clients was found to be 60.46% and has an average raw mean score of 10.25 ± 2.85 with the value range of 3 to 15. It was entered into the model and explained 26.8% variability in level of satisfaction. This component was significantly associated with the level of satisfaction at p (0.0001) (0.131, 0.235). Availability of services and information provided were also entered in the model and explained (-0.7%) variability in the level of satisfaction. The percentage mean scale score was 8.85% and has an average raw mean score of 11.59 ± 3.08 with the value range of 3 to 100.

**Predictors of client satisfaction**

Results of the multivariable regression analysis indicate that staff services and physical facilities significantly influence client satisfaction in ROPD while provider behavior was the most important factor that influences client level of satisfaction in PWOPD. At both departments, accessibility of health services was the strong predictor of client level of satisfaction. As indicated in Table 16, the regression estimates and the relative effect of each predictor factor for the level of client satisfaction with different components of an outpatient department indicated. For example, a unit increment in accessibility of health services improves client satisfaction by 0.164 at p (<0.0001) (0.138, 0.191) at a ROPD, while 0.120 at p (<0.0001) (0.078, 0.163) at the PWOPD. The final model explained 55.6% and 54.9% of the variation in the level of client satisfaction at regular and private wing outpatient department, respectively (Table 17).

**DISCUSSION**

The overall level of satisfaction with different healthcare services provided at regular and private wing clients was (58.16%) and (68.84%), respectively. There was no statistically significant difference between the mean overall level of client satisfaction with healthcare services delivered at both departments (F [1; 399] = 0.000, P=1.000). The result of this finding - the level of satisfaction is lower than the study conducted in Hawassa University Teaching Hospital, Jimma University Specialized Hospital (JUSH), Nigeria in Aminu Kano Hospital, Nepal and India in Rural Haryana in which the clients satisfaction were 80.1, 77.0, 83, 75.9 and 89.1%, respectively (Assefa et al., 2014; Assefa et al., 2011; Qadri et al., 2012; Rajbanshi et al., 2014), but this result was in line with the study conducted in Debeberbirhan and Bahir Dar Felege Hiwot Referral Hospital which showed clients satisfaction of 57.7 and 57.8%, respectively (Agumas et al., 2014; Mezemir et al., 2014). However, the study conducted on client satisfaction with outpatient services in Tigray zonal hospitals, Wolaita Sodo University Teaching Hospital, Eastern Ethiopia and Maharashtra reported client satisfaction of 43.6, 54.2, 54.1 and 50.89%, respectively which is lower than the satisfaction level revealed by this study (Girmay, 2006; Abdosh, 2006; Gamo et al., 2015). The possible reason for the observed difference might be due to the that socioeconomic variations of clients, time of the study, availability of human power and infrastructure, client load, the commitment of the concerned bodies and methodological variation which may negatively or positively affect the level of satisfaction.

Among the socio-demographic variables, only marital and educational status of respondents makes a significant association with clients' satisfaction at ROPD while none of them showed a statistically significant association at PWOPD. In agreement with this, studies revealed that the clients' educational status determines their level of satisfaction. For example, the study conducted in Tigray zonal hospitals towards client satisfaction with outpatient services showed that respondents who have tertiary education (diploma and above) were more satisfied as compared to those with lower educational level (Girmay, 2006). In contrast, a study conducted in Iraq revealed that patients with lower educational levels (illiterate /primary) were more satisfied than those with

**Table 16.** The extracted factors as the final predictors of Client level of satisfaction with different component of the outpatient healthcare services at RWOPD.

| Client department | Factors | Unstandardized Coefficient | | Standardize Coefficient β | T | P-value | 95%CI for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std.Error | | | | LB | UB |
| ROPD | Staff services | 0.078 | 0.019 | 0.218 | 4.102 | 0.000 | 0.041 | 0.116 |
| | Accessibility of health services | 0.164 | 0.013 | 0.540 | 12.212 | 0.000 | 0.138 | 0.191 |
| | Physical facility | 0.047 | 0.014 | 0.149 | 3.470 | 0.001 | 0.020 | 0.074 |
| | Availability of services | -0.002 | 0.002 | -0.045 | -1.096 | 0.274 | -0.005 | 0.002 |
| | Provider behavior | 0.021 | 0.013 | 0.086 | 1.656 | 0.099 | -0.004 | 0.047 |
| PWOPD | Provider behavior | 0.130 | 0.014 | 0.561 | 9.092 | 0.000 | 0.102 | 0.158 |
| | Accessibility of healthcare services | 0.120 | 0.022 | 0.344 | 5.575 | 0.000 | 0.078 | 0.163 |
| | Physical facility | 0.012 | 0.020 | 0.036 | 0.570 | 0.570 | -0.029 | 0.052 |

**Table 17.** The model summary of extracted factor at both departments.

| Client department | R | $R^2$ | Adjusted $R^2$ | Std. error of the estimate |
|---|---|---|---|---|
| ROPD | 0.750[a] | 0.562 | 0.556 | 0.66659110 |
| PWOPD | 0.745[b] | 0.556 | 0.549 | 0.67167706 |

**a.** Predictors: (Constant),provider behavior, physical facility, accessibility of health services, staff services. **b.** Predictors: (Constant),accessibility to healthcare services, provider behavior.

higher levels (secondary/university), and education showed a negative significant relationship with patient satisfaction level (Fasika, 2013).

Marital status of respondents was statistically associated with the level of client satisfaction. Respondents who were divorced had 0.622 unit greater satisfaction compared to the married ones at the ROPD. This finding is contrary to the study conducted at selected health facilities in six regions of Ethiopia which reported that patients who were divorced were 45% less likely to have high satisfaction score than those who were married (Bekele et al., 2008).

The study conducted at Hawassa University Teaching Hospital indicated that there was no observed association between clients' satisfaction and socio-demographic variables which are in line with the present study at PWOPD (Assefa et al., 2014). Studies revealed that the causes of clients' dissatisfaction with the healthcare services at public health institutions are a lack of drugs and supplies in the hospital pharmacies. The current study shows that about 53.36 and 46.62% of clients with the prescription for drugs did not get some or none of the ordered drugs from the hospital's pharmacy at regular and private wing outpatient departments, respectively. This finding

is supported by the study conducted in Tigray zonal hospitals in which 61% of those clients with the prescription for drugs did not get the ordered drugs from the hospitals' pharmacies (Girmay, 2006). Similarly, the study done at JUSH indicated that about 70% of the clients with the prescription for drugs did not get some or all of the ordered drugs from the hospital's pharmacy (Assefa et al., 2011). In contrast to this, the result of the study conducted in Deberebirhan Referral Hospital showed that more than 68% of the patients were getting prescribed drugs within the hospital pharmacy (Mezemir et al., 2014). In this report, it is also indicated that 39.18 and 33.83% of

respondents were unsatisfied from regular and private wing outpatient department with the availabilities of drugs and supplies, respectively.

The finding of this study shows that 77.8 and 53.6% of clients with the prescription for X-ray/ultrasound procedure did not get some or any of the ordered procedures from the hospital at regular and private wing outpatient department, respectively. In this study clients' privacy was maintained by 96.3% at regular and 98.5% at PWOPD which is relatively higher than the studies conducted in Wolaita Sodo University Teaching Hospital and Nepal OPD at Chitwan Medical College Teaching Hospital, where clients are satisfied with privacy during consultation by 90.7 and 91.5%, respectively (Gamo et al., 2015; Rajbanshi et al., 2014).

Among the extracted factors from the items that measure the level of client satisfaction; accessibility of healthcare services was the determinant of clients' satisfaction at both departments, but staff services and physical facility were the significant determinants of clients' satisfaction at ROPD. On the other hand, provider behavior was a significant determinant of clients' satisfaction at the PWOPD. Most of these factors were also found to be determinants of clients satisfaction with outpatient department healthcare services at hospital setting in studies conducted elsewhere (Mezemir et al., 2014; Mao, 2012; Rajbanshi et al., 2014; Sanjib and Bhaben, 2015). For example, the study conducted on satisfaction with healthcare services of outpatient department at Chitwan Medical College Teaching Hospital of Nepal indicated that 43.7% patient were poorly satisfied with the physical facilities of the hospital (Rajbanshi et al., 2014).

**Limitation of the study**

(i) The finding of this study might be subjected to social desirability bias due to the fact that facility based studies can produce more positive responses since the respondents were interviewed in the hospital compound.
(ii) The finding of this study was limited to healthcare services rendered at regular and private wing adult outpatient departments so it does not shade light to specific services in the other departments.
(iii) This study was only limited to quantitative aspect.
(iv) The client may feel more satisfied immediately after their consultation which relatively short-lived than they do afterward.

**Conclusion**

(i) The overall level of client satisfaction in Nekemte Referral Hospital at regular and private wing outpatient department was low.
(ii) The mean overall level of client satisfaction with

healthcare services delivered at private wing and regular adult outpatient department of the hospital was not statistically different.
(iii) Marital status, educational level, type of visit, the means respondents visited the hospital and travel time of respondents were statistically associated with client satisfaction at PWOPD.
(iv) Staff service and physical facility were the strong predictors of client satisfaction at the ROPD.
(v) Client satisfaction at a PWOPD was highly predicted by provider behavior.
(vi) Accessibility of health services was a strong predictor of client satisfaction at both departments.
(vii) This study had shed light on some most important determinants of client satisfaction in the hospital at both departments. Based on these findings, the hospital in both categories of departments has to do for betterment, especially on identified determinant factors of clients' satisfaction.
(viii) It is highly suggested that a detailed and extensive study should be conducted by adding another explanatory variables and qualitative aspects to get the clear picture of the whole situation of the problem at the hospital.

**COMPETING INTERESTS**

The authors have not declared any conflict of interests.

## Abbreviation

**E.C,** Ethiopian calendar; **ETB,** Ethiopian Birr; **FMOH,** Federal Ministry of Health; **IOM,** Institute of Medicine; **JUSH,** Jimma University Specialized Hospital; **OPD,** outpatient department; **PWOPD,** private wing outpatient department; **ROPD,** regular outpatient department

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