Routine health service records utilization and Administrative reports for decision making in four hospitals of oromia regional state, Ethiopia

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Abstract

Health Management Information System which draws data from routine health service records and administrative reports provides an ideal source of indicators that are reviewed frequently to monitor and refine program implementation. The importance of this study was to assess the utilization status of routine health service records and administrative reports for decision making, and identify factors affecting its use in four hospitals of Oromia Region, Ethiopia.

Facility based cross-sectional study design was used to explore the status and factors affecting data utilization for decision in four governmental hospitals of Oromia region. Quantitative data were collected by self-administered questionnaires and qualitative data was collected from hospital management by Focus Group Discussion (FGD). Accordingly a total of 234 participants were involved for quantitative study where as 8 participants from each hospital which accounts a total of 32 participants were subjected to qualitative study. Data were analyzed using SPSS version 20. Odds Ratio and 95% confidence interval was used to identify strength and existence of association between variables. The findings of Routine Health Service records utilization and administrative reports for decision making were presented in tables and figures whereas descriptions were made in frequency and percentage.

The study revealed that, the overall health data utilization for decision making was 56% and there was a difference in data utilization for decision making among study hospitals which was 52%, 55%, 56% and 62% in Goba, Ginnir, Adama and Bishoftu hospitals respectively. Knowledge on acceptable percentage of data Lot Quality Assurance Sample (LQAS), participation in planning and getting feedback from respective HMIS unit were predictors of data utilization for decision making from the exposed variables, [(at p value 0.047, AOR= 0.397, 95% CI; 0.012, 0.744), (p value 0.037, AOR=0.079, 95% CI: 0.011, 0.557) and (p value 0.001, AOR=0.003, 95% CI: 0.000, 0.021)] respectively. Qualitative data also revealed that dalliance in full automation, inadequate supportive supervision of stake holders and interruption of supplies affected the quality of data utilization for decision. Therefore all stake holders and hospitals' management should improve the knowledge of health professional and management team on acceptable percentage of data LQAS through training, fully implement automated HMIS, conduct supportive supervision, participate health cadres in planning, timely avail of supplies, arrange frequent feedback process from respective HMIS unit and develop information technology infrastructures to strengthen Routine Health Service Records Utilization and Administrative Reports for Decision Making.

Keywords: Routine Health Service; Administrative Reports; Decision Making; Hospitals; Data Utilization

Introduction

Background of the study

Health Management Information System (HMIS) is as an information system designed to assist the management and planning of health programs and directly derived from delivery of health care, but the utilization of health data for decision is something more than this, and can be assured when the collected, processed and analyzed data is used for evidence based decisions in the health systems, including health planning and budgeting, staff employment, employee performance appraisal or any other decisions help to influence health policy (FMOH guideline 2013). It is a tool that shows institutional output and provides an ideal source of indicators that are reviewed frequently to monitor and refine program implementation. Hence, the production of Health Information is an important function of a health system. It has been said that Health Information is what holds a health system together (Lippeveld, T., et al, 2010).

Health care system in developing countries has undergone many structural changes over the years in response to prevailing health problems and in recognition of weakness in the existing health delivery system. Global infectious threats, scrutiny of progress towards the Development Goals and performance-based release of donor funding have contributed to the

increased awareness of the need for evidence based decision making. Recently most donors request the changes that come on the behavior of community or improvement in the life of the public than reforms created or bureaucracies built, and these bring window of opportunity to set indicators at all level to monitor progress towards the target and take managerial decisions in the health system (Health Metrics Network, 2016).

Countries with comprehensive registration system are generally developed countries such as America, Asia and Europe. In low income countries efforts for better documentation and utilization of data for decision making have increased over the past two decades. Advances in computer utilization enable large volume of data to be processed and analyzed in short period of time. In 2013 all stake holders come together and create innovate solutions to use information globally through Health Metrics Network or joint platform(Kimberlyn M. and Charlyn B., 2013).

The need for information is particularly acute when resources are limited and an unwise allocation of funds can mean the difference between survival and death. Reliable and timely health information is an essential foundation of public health action. However, it is not available in developing countries, owing under investment in the system for data collection, analysis, dissemination and use. As a consequence decision makers are unable to identify problems and needs, track the progress, evaluate the impact of interventions and make evidence based decisions on health policy, program design and resource allocation. It is not because countries have insufficient resources that they should forgo good health information. Indeed, they are the ones that can least afford to be without it (Health Metrics Network, 2013).

Cibulskis and Hiavalyer (2010) suggested that there were main reasons to implement good Health Information System globally to contribute for efficiency, effectiveness and responsiveness of health related programs. These include, there is an increased demand for accountability and evidence based decision making in clinical practice, evidence based policy development, planning, management and evaluation of health service for the best use of limited resource (WHO Regional Office for western Pacific, 2010).

In Ethiopia the decentralized responsibilities to find resources for health institutions at local level require better health management and information. As commitment to health sector reform has strengthened, the realization of a good information system is necessary to support reform. Health Management Information System (HMIS) strategy fits with an objectives and priorities of health sector development plan. This plan by itself responds to the objectives and priorities of decentralized authorities to the health need of Ethiopian population and international agreements. Similarly HMIS strategy must take account of these national, local and international requirements as well as those of health sector itself were to develop and implement a comprehensive and standardized national HMIS and to ensure the use of information for evidence based planning and management of health services (MOH HSDP IV, 2010).

The old Health Management Information System (HMIS) revealed that lack of co-ordination insufficient knowledge, less participation of employees in planning, inadequate feedback both from outside and inside health institutions, insufficient resources such as computer with accessories, Master Patient index and shelves, shortage of skilled human resources were the key factors affecting Health Management Information System (HMIS) performance (FMOH 2010HMIS report).

The Ethiopian Health Management Information System (HMIS) was adapted in 2006 to generate
quality healthcare data that help to improve decision-making at all levels (FMOH, 2015). Poor data quality: incompleteness, inconsistency, inaccuracy, and non-timelinesshas challenged the Ethiopian health information system. The possible explanationcould be having paper based HMIS, high cost for duplicating HMIS formats, transportation, tediousness to compile formats, personal errors while recording and compiling reports (Teklegiorgis et al., 2016).This study assesses the status of data utilization for decision making and help to design proper interventions that might help to ensure efficiency, effectiveness and equitable health service delivery.

Statement of the problem

As many studies in developing countries showed, the status of health data used for decision making was low; this was due to shortage of supportive supervision and feedback mechanism, insufficient training, improper planning process and less participation of concerned bodies and inadequate supplies (Health Metrics Network, 2016).

A study conducted by Gashaw(2008) in North Gonder and Sultan Abajebel (2010) in different Districts of health offices of Jimma zone, on utilization of health information for decision making showed that 12% and 32.9% health information was used for decision making and the main factors affected data utilization was knowledge of employee, less supportive supervision, feedback mechanism and less accessibility of computer. Therefore, unless the culture of data utilization for evidence based decision making is improved the current modality of health service delivery does not work.

Thus, this study identifiesthe status and factors affecting health data utilization for evidence based decision making in the study hospitals. The finding would help the study hospitals to identify their status in routine health service records and administrative reports utilization for evidence based decision making and intervene on the gaps identified and also enables the study hospitals to use the data to communicate with concerned bodies such as policy makers, resource allocators (RHB), local stake holders including the public and local administrative bodies to support them on HMIS interventions. It would also help as base line information for further similar studies in the study area.

Scope of the study

This study focused on the status of any health data utilization for evidence based decisions making including planning, budgeting, financial resource allocation, human resource

assignment, employee performance appraisal and other managerial interventions in four selected Hospitals of Oromia Region, Ethiopia.

Objectives

The general objective of the study was to assess the utilization status of routine health service records and administrative reports for evidence based decision making and to identify factors affecting it in four selected Hospitals of Oromia Region, Ethiopia.

Specific objectives

To assess the extent utilization of routine health service records and administrative reports for decision making.

To identify factors which have association with utilization of routine health service recording and administrative reporting for decision making.

Materials and Methods

Study Area and period

The study was conducted in one zone and two town administration hospitals of Oromia national regional state; namely Bale zone, and Adama and Bishoftu town Administrations. In Bale zone the study was conducted at Goba and Ginnir hospitals, in Adama at Adama Hospital and in Bishoftu at Bishoftu Hospital.

All are public hospitals, governed by board and the board is accountable to the Regional Health Bureau. All study hospitals deliver preventive, promotive, curative and rehabilitative health services, though the extent of service delivery may differ based on hospital status and infrastructure and type of professionals exist within the hospital.

In Oromia Adama, Bishoftu, Goba, Ginnir and Ambo were hospitals implemented HMIS reform since 2009 and utilization of standardized recording, tallying, reporting and performance monitoring format were practiced. All these hospitals have the responsibility to collect data from routine records and administrative reports, make analysis, presentation, interpretation, send to the higher hierarchy and use their information for planning and evidence based decision.

Adama hospital is a referral hospital serve for an estimated of 5 million populations. It is found at 90 km distance from Addis Ababa. It has totally 250 beds, on average it has 650 patients per day, Average Length of Stay (ALOS) at Adama hospital is 6.5 days, and Bed occupancy rate was 86%, the hospital is implementing all initiatives planned by country ministry of Health, and the hospital is a teaching center for Medical Specialty, medical Doctor and other specialty programs, such as Anesthesia, x-ray technician, Nursing and others on which the region have scarce professionals.

Bishoftu Hospital is found at 47 km distance from Addis Ababa at eastern direction. It serves for a catchments population of 1.5 million; it has 150 functional beds, Average daily patient load

(census) was 650. Bed occupancy rate (BOR) was 87%, Average Length of Stay (ALOS) was 3.6 days and the hospital is implementing all initiatives planned by country ministry of Health.

Goba hospital is a zonal hospital located in Oromia National Regional state, Bale Zone; 450 km in south east direction from Addis Ababa. The hospital provides services for an estimated population of 757,952, with 120 beds, have totally 157 technical and 147 supportive staffs. The Average length of stay (ALOS) was 5.6 days and the hospital is implementing all initiatives planned by country ministry of Health

Ginnir hospital is a general hospital found in Bale zone, established since 2000 G.C. It is found at 560 km distance from Addis Ababa and 148km from the capital city of Bale.This hospital provides service to an estimated of 1 million populations. Ginnir hospital is providing services with a total staff of 242, out of these 127 are technical staffs. The Hospital provides different curative services owning 124 beds. Average Length of stay (ALOS) at Ginnir hospital was 6.5 days, Bed Occupancy rate (BOR) was 56%, and the hospital is implementing all initiatives planned by country ministry of Health

Data collection process was conducted over a period of 20 days: from January 10 to 31, 2018 in four selected hospitals of Oromia Region, Ethiopia.

Study design

Multi-center facility based cross-sectionalstudy design was conducted in four selected government hospitals of Oromia Region.

Source population: the source population of the study was all health professionals, non-technical staff management members and HMIS unit workers of four selected hospitals in Region.

Study population: the study population includes selected health professionals from all cadres who were working in four selected hospitals during the study period. In addition, selected non-technical staff management members involved in decision making of the hospitals were also part of the study population.

Sample size and Sampling technique

The sample size for quantitative study was calculated using single population proportion formula, and the final sample size including 10% non-response rate became 234. In addition four FGDs having eight participants one per each hospital was conducted. Of the functional hospitals available in Oromia national region state, four hospitals which implemented the HMIS reform early, since July 2009 were selected purposefully to assess the status of data utilization for decision making. To get proper sample from each hospital, the total sample size was proportionally allocated to selected hospitals. In each hospital proportionate sampling was allocated among health professionals and non-technical staff management members.

For qualitative study 8 individuals ofmulti-disciplinary management team members were included in each hospital,

and a total of 32 participants were involved in the study. They were selected purposefully since they were members of hospital service quality assessment committee and have better awareness on the status of HMIS performance as well as problems encountered in the implementation.

Data collection procedures and data quality control

The data were collected by semi-structured questionnaire prepared in English; Health professionals received training on Health Management Information System (HMIS) in English. They also perform registration, make tally, report and calculate indicators and communicate technical terms more in English. Quantitative data were collected by self-administered questionnaires, and FGD conducted after obtaining verbal consent from participants and it was recorded using tape recorder, and FGD guide was used to facilitate the discussion.

The instrument was pre-tested and necessary modification was made based on the gaps identified in questionnaires as well as in FGD. Data collectors were trained, the completeness of questionnaires was checked during data collection, data entry, post data entry and it was checked and cleared during analysis.

Data Processing and Analysis

Quantitative data were entered and analyzed using SPSS version 20 statistical Package. 95% confidence interval at p value 0.05 as cut of point was used to identify any statistical significant association between utilization of data for decision making and other exposed variables. Multivariate logistic regression analysis was used to identify the predictors of data utilization for decision making through implementation of HMIS. The strength of association was measured using Odd Ratio (OR) and data was presented by tables and graphs.

FGD was conducted in 'Afaan Oromo' then translated in to English, during data analysis the principal investigator attentively listened to the tape recorder repeatedly, summarized it, reviewed the main themes, issues and wrote the summery to supplement quantitative data.

Ethical Consideration

Ethical clearance was obtained from Jimma University College of Public Health and Medical Sciences ethical clearance committee. Official Letter was written to the selected hospitals by Regional Health Bureau. Before data collection, the objective of the study was explained to study subjects and consent was obtained by the format attached to questionnaires. The participants were told that they have full right not to participate in the study even can withdraw or stop at any time they want without any effect and they were informed not to write their names as well as assured that the information they provide is kept confidential.

Results & Discussion

Socio-demographic status

Two hundred thirty four participants participated on quantitative study and 32 participants involved on FGD from four hospitals yielding a response rate of 100%. Out of these the participants from Adama hospital covered more than 1/3rd which accounted 84 (35.9%) due to their high employee ratio. Almost half 115 (49.1%) of the study participants were females while 119 (50.9%) accounted males. The majority of the participants 154 (65.8%) were BSc holders followed by diploma which accounted 53 (22.6%). Nearly half of them 109 (46.60%) have served for less than five years. Out of the total study subjects 222 (94.9%) were technical staffs and only 12 (5.1%) were non-technical staff management team members. The majority of technical staffs 144(61.5%) were Nurses in profession (table 1).

Table 1: Socio-demographic status of participants from selected hospitals of Oromia, Ethiopia.

Profile of study participants (N=234)	Hospitals Surveyed				
	Ginnir (N/%)	Goba (N/%)	Bishoftu (N/%)	Adama (N/%)	Total (N/%)
Number of study participants	47 (20.1)	50 (21.4)	53 (22.6)	84 (35.9)	234 (100)
Sex Male	28 (59.5%)	25 (50%)	20 (40%)	46 (54.8%)	119 (50.9)
Female	19 (40.5%)	25 (50%)	33 (60%)	38 (45.2%)	115 (49.1)
Educational level Diploma	11 (23.4%)	11 (22%)	15 (28.3%)	16 (19%)	53 (22.6)
BSc	32 (68%)	34 (68%)	33 (62.2%)	55 (65.4)	154 (65.8)
MD	4 (8.6%)	5 (10%)	4 (7.5%)	12 (14%)	25 (10.7)
Specialist	-	-	-	1 (1.6%)	1 (0.4)
MSc	-	-	1 (2%)	-	1 (0.4)
Service Year <5 years	36 (76.5%)	22 (44%)	20 (38%)	31 (37%)	109 (46.6)
6-10 years	6 (13%)	9 (18%)	10 (19%)	18 (21%)	43 (18.4)
11-15 years	3 (6.3%)	7 (14%)	6 (11.2%)	10 (12%)	26 (11.1)
16-20 years	1 (2.1%)	2 (4%)	6 (11.2%)	9 (10.7%	18 (7.7)
>20 years	1 (2.1%)	10 (20%)	11 (20.6%)	16 (19%)	38 (16.2)
Field of study - Physicians	4 (8.5%)	5 (10%)	4 (7.5%)	13 (15.5%)	26 (11.1)

Nurses	31 (66%)	30 (60%)	31 (58.5%)	52 (61.9%)	144 (61.5)
Other medical staffs	9 (19.2%)	12 (24%)	15 (28.4%)	16 (19%)	52 (22.2)
Non-technical staffs	3 (6.3%)	3 (6%)	3 (5.6%)	3 (3.6%)	12 (5.1)

Data Utilization for decision making

One hundred thirty two (56%) of study participants reported that the used health service data or Adminstration reports for managerial decisions. Bishoftu accounted 62% which was the highest from the study hospitals in data utilization for decision making.

Frequent report of qualitative data also revealed that after Health Management Information System (HMIS) was implemented; employees and management teams understood the advantage of data hence, the registration system is made simple, disease classification is made easily understood, data on medical record is made simple to register and tally and Master Patient Index (MPI) is made ever available if the patient may forget medical record number.
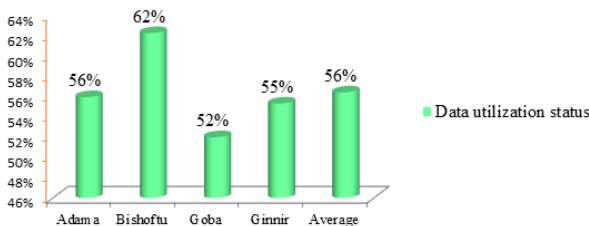

Figure 1: status of data use for decision among study hospitals of Oromia, Ethiopia; May 2018.

Data utilization for decision making is a corner stone for monitoring and evaluation of health service status of the population. The study revealed that, the overall health data utilization for decision making after the implementation of HMIS reform was improved and there were differences in data utilization for decision making among study hospitals. The difference between hospitals in data utilization for decision might be due to more frequent trainings provided for Adama and Bishoftu hospital staffs; in addition Adama and Bishoftu have more IT infrastructure and have internet access than Ginnir and Goba hospitals.

The finding of this study is lower than the studies conducted in south Africa and Zambia which were 79% and 72% respectively (Murray C, Frenk J., 2014 and WHO, 2015), but the result was higher than the study conducted in Ghana and Uganda (WHO, 2015 report and Peter Kintu, 2015). In South Africa HMIS implementation was decentralized and the local government implemented automated HMIS by providing adequate training so that improved data utilization was practiced whereas in Ghana less feedback and untimely report made the data utilization controversial. On the other hand it is higher than previous studies conducted in different regions of Ethiopia: North Gonder on HIV/AIDS programs and in Jimma

district health offices in which accounted 12% and 32.9% respectively (Gashaw2008, Sultanabajebel, 2010).This study showed that there is better utilization of data for decision making when compared to the previous studies, and the difference might be due to time gap andthis study conducted after provision of training and HMIS implementation.

Knowledge related to HMIS

HMIS reform was implemented in all study hospitals. One hundred ninety six (83.8%) of study participants received training on Health Management Information System (HMIS) while 38(16.2%) did not. Referring this to each hospitals the majority 50(94.3%) from Bishoftu hospital were trained while only 31(65.9% from Ginnir hospital. FGD participants in two hospitals namely Goba and Ginnir reported that training was given only once before a year and six month back and newly recruited health professionals weren't received training.

One hundred ninety six (83.8%) of participants reported that they have basic information on HMIS indicators through training that was given at the hospital. The study showed that the participants in Bishoftu hospital 50(94.3%) to have an information on HMIS indicators were higher than the participants from other three study hospitals.

The study also indicated that 194(82.9%) and 190(81.2%) of the study participants have knowledge on minimum indicators and acceptable percentage of data Lot Quality Assurance Sample respectively. Fifty (94.4%) participants from Bishoftu hospital explained that they have knowledge on minimum indicators and acceptable percentage of data Lot Quality Assurance Sample which was the highest score among study Hospitals. But, the study participants from Ginnir hospital have the least knowledge 30(63.8%) on minimum indicators and 27 (57.5%) on acceptable percentage of data Lot Quality Assurance Sample respectively. Thematic analysis revealed that this is due to the existence of many untrained health professionals; training was given only one while automated HMIS was launched and continuous training is required for newly hired staffs (table 2).

Table 2: Knowledge related to HMIS among study participants of selected Hospitals from Oromia Region, Ethiopia.

Knowledge related to HMIS variables	Surveyed hospitals				Total N (%)
	Ginnir N (%)	Goba N (%)	Bishoftu N (%)	Adama N (%)	
Receive training on HMIS Yes	31 (65.9)	43 (86)	50 (94.3)	72 (85.7)	196 (83.8)
No	16 (34.1)	7 (14)	3 (5.7)	12 (14.3)	38 (16.2)
Can define HMIS indicators Yes	31 (65.9)	43 (86)	50 (94.3)	72 (85.7)	195 (83.3)
No	16 (34.1)	7 (14)	3 (5.7)	12 (14.3)	39 (16.7)
Have knowledg	30 (63.8)	42 (84)	50 (94.3)	72 (85.7)	194 (82.9)

e on minimum indicators Yes					
No	17 (36.2)	8 (16)	3 (5.6)	12 (14.3)	39 (16.7)
Knowledge on acceptable % of LQAS - Yes	27 (57.5)	41 (82)	50 (94.4)	72 (85.7)	190 (81.2)
No	20 (42.5)	9 (18)	3 (3.6)	12 (14.3)	44 (18.8)

Having fiscal year plan and participation on the planning process

The study showed that 204(87.2%) of participants have individual fiscal year plan. Forty nine(92.5%) of participants from Bishoftu hospital have a fiscal year plan which was the highest than that of Adama, Goba and Ginnir 44(88%), 73(86.9%) and 38(80.8%) respectively, while the rest participants 30(12.8%) from all study hospitals reported that they have no fiscal plan while data was collected.

The study also depicted that 185(79.1%) of study participants have basic knowledge in planning process and the knowledge assessment was almost the same in all study hospitals. But in Goba hospital 36(72%) participants are knowledgeable which is slightly lower than the rest three hospitals.

Eighty six (36.8%) of all participants took part in planning process. Among the study hospitals the participants from Bishoftu hospital 22(41.5%) have participation in planning process rather than the participants from other hospitals (table 3).

Table 3: Participation in planning process of participants in selected Hospitals of Oromia Region, Ethiopia.

Variables related to planning		Surveyed hospitals				Total (N/%)
		Ginnir (N/%)	Goba (N/%)	Bishoftu (N/%)	Adama (N/%)	
Having plan at hand	Yes	38 (80.8)	44 (88)	49 (92.5)	73 (86.9)	204 (87.2)
	No	9 (19.2)	6 (12)	4 (7.5)	11 (13.1)	30 (12.8)
Have knowledge on planning process	Yes	38 (80.8)	36 (72)	43 (81.1)	68 (80.9)	185 (79.1)
	No	9 (19.2)	14 (28)	10 (18.9)	16 (19.1)	4 (20.9)
Participation in planning	Yes	17 (36.3)	16 (32)	22 (41.5)	31(36.9)	86 (36.8)
	No	30 (52.7)	34 (68)	31(58.5)	53 (63.1)	148 (63.3)

Health professionals paid more attention to the service they render than to data processing and utilization due to long and inherited norm. This study found that training was given for participants (83.8%) even though there were no refreshment trainings to change the norm of employees. The rate of plan at hand was 87.2%, but participation in planning was only 36.8%, and the finding was comparable with assessment report of ESHE Ethiopia which explained that the trend of health data utilization for managerial decision and for policy influence is still low (FMOH, 2015).

Accessibility of information technology for data utilization

Even though HMIS was implemented in all the study hospitals, the respondents from Goba 50(100% and Ginnir hospital 47(100%) reported that there are many challenges due to lack of computer, lack of software and lack of training, while the rest from the study hospitals reported that they have no problem except lack of training. Qualitative data also supported that there were shortages of supplies such as registration book, tally sheet, reporting format, and adequate class room and still the revised version weren't have formats for data capturing for some health service.

Concerning computer skill more than three-four (76.9%) participants from all study hospitals reported that they have basic computer skill: 71(84.5%) participants from Adama and 45(84.9%) from Bishoftu hospitals reported that they have basic computer skill and also they have internet access in their hospitals but, only 53(63.1%) participants from Adama and 34(64.2%) from Bishoftu hospitals reported that they utilize the internet due to lack of other accessories.

This study indicated that 214 (91.5%) of all study participants believed that computerization can fasten HMIS service whereas the remaining 20(8.5%) of study participant did not believe that computerization can fasten HMIS service and believed even creates work load. All study participants from four hospitals (100%) explained that the hospital they were employed is implementing both manual based and computerized HMIS (table 4).

Table 4: Accessibility of information technology in selected Hospitals of Oromia, Ethiopia.

Variables		Surveyed hospitals				Total (N/%)
		Ginnir (N/%)	Goba (N/%)	Bishoftu (N/%)	Adama (N/%)	
Have basic computer skill	Yes	28 (59.570	36 (72.0)	45 (84.9)	71(84.5)	180(76.9)
	No	47 (100)	50 (100)	8 (15.1)	13 (15.5)	118 (50.4)
Internet access in hospital	Yes	-	-	53 (100)	84 (100)	137 (58.5)
	No	47 (100)	50 (100)	-	-	97 (41.5)
Utilization of internet	Yes	-	-	34 (64.2)	53 (63.1)	87 (37.2)
	No	47(100)	50(100)	19 (35.8)	31 (36.9)	147 (62.8)

Computer faster HMIS	Yes	46 (97.8)	49 (98)	52 (98.1)	67 (79.7)	214 (91.5)
	No	1 (2.2)	1 (2)	1 (1.9)	17 (20.3)	20 (8.5
Received updated HMIS information (n=39)	Yes	3 (6.3)	5 (10)	15 (28.3)	16 (19)	39 (16.7)
	No	44 (93.7)	45 (90)	38 (71.7)	68 (81)	195 (83.3)
Source of Information for updated HMIS (for those got updated information n=39)	Library	-	-	2 (3.7)	2 (2.3)	4 (1.7)
	Internet	-	-	-	4 (4.7)	4 (1.7)
	Training document	4 (8.5)	1 (2)	12 (22.)	2 (2.3)	19 (8.1)
Type of HMIS being implemented (n=234)	Both manual & computerized	47 (100)	50 (100)	53 (100)	84 (100)	234(100)
Problem of HMIS implementation	Lack of knowledge	34 (72.3)	33 (66)	17 (32)	28 (33.4)	112 (47.9)
	Lack of computer	4 (8.5)	3 (6)	-	-	7 (2.99)
	Lack of software	8 (17)	14 (28)	-	-	22 (9.4)
	Inadequate supplies	1 (2.2)	-	33 (62.2)	30 (35.7)	64 (27.4)

Supportive supervision

Two hundred twenty four (95.7%) of the study participants reported that they were supervised by different responsible bodies. All participants (100%) of Bishoftu hospital explained that they were provided supportive supervision, followed by Adama 83 (98.8%). The supervision was frequently conducted by different stakeholders (NGOs) which accounted 74 (31.6%) followed by the supervision undertaken by hospital management 53(22.6%), and internal supervision (conducted by management) was highest in Adama hospital which accounted 29 (34.9%). Only 43(18.3%) of the participants stated that Oromia Regional Health Bureau has undertaken supervision and it was the highest for Adama hospital which accounted 21 (25.3%).

Qualitative data indicated that the previous stake holder who took initiative initially over HMIS implementation did not conduct regular supervision to sustain the program when compared to other stake holders, but the rent partners working on HMIS are providing technical support and capacity building activities to the hospitals. Frequent report stated that internal supportive supervision was not regular and strong to fill the identified gaps. Most supervisors were management teams and they reported on the gap identified regarding the registration system: registration book lacked basic service information required for service quality, the narrowness of tally sheet, incompleteness of reporting format, dalliance of maintenance on the software, insufficient training, and failure to take action by Regional Health Bureau.

According to this study 156(66.7%) participants explained that they did not get feedback from their respective HMIS unit on the report they sent, but in Bishoftu hospital 25(47.2%) participants described they got feedback, that was better as compared to other hospitals. The qualitative data indicated that this finding is due to Bishoftu hospital management committee assigned a more active quality operational committee to let them monitor and evaluate the performance of all case teams so that they were able to provide feedback timely (table 5).

Table 5: Implementation of supportive supervision in selected hospitals of Oromia Region Ethiopia

Study variables		Surveyed hospitals				Total (N/%)
		Ginnir (N/%)	Goba (N/%)	Bishoftu (N/%)	Adama (N/%)	
Existence of supportive supervision	Yes	40 (85.1)	48 (96)	53 (100)	83 (98.8)	224 (95.7)
	No	7 (14.9)	2 (4)	0	1 (1.2)	10 (4.3)
Responsible body who conduct supportive supervision (N=224)	Regional Health Bureau	10 (24.4)	11 (22.9)	10 (18.9)	21 (25.3)	52 (23.1)
	Hospital Management	10 (24.4)	12 (25)	14 (26.4)	29 (34.9)	65 (28.9)
	NGOs (stake holders)	20 (48.7)	15 (31.3)	20 (37.7)	24 (29)	79 (35.2)
	Others	1 (2.5)	10 (20.8)	9 (17)	9 (10.8)	29 (12.8)
Feedback from respective HMIS unit	Yes	12 (25.5)	13 (26)	25 (47.2)	28 (33.3)	78 (33.3)
	No	25 (74.5)	37 (74)	28 (52.8)	56 (66.7)	156 (66.7)
Bi-annual review meeting conducted last year at hospital level	Yes	36 (76.5)	31 (62)	42 (79.2)	68 (80.9)	177 (75.6)
	No	11 (23.5)	19 (38)	11 (20.8)	16 (19.1)	57 (24.4)

| Existence of improvement after review meeting | Yes | 26 (55.3) | 22 (44) | 34 (64.2) | 56 (67) | 138 (59.0) |
| | No | 21 (44.7) | 28 (56) | 19 (35.8) | 28 (33) | 96 (41.0) |

Frequent report of qualitative data stated that after Health Management Information System (HMIS) was implemented, employees and management team understood the importance of data and there was an improvement in timelines of the report; hence, the registration system is made simple, disease classification is made easily understood, data on medical record is made simple to register and tally and Master Patient Index (MPI) is made ever available if patient may lose medical record number. All four hospitals implemented computerized and manual HMIS, even though the automation was still challenging.

Supportive supervision improves the job performance, but stake holders especially NGOs working on HMIS did not conduct supportive supervision regularly when compared with other program stake holders such as ICAP Ethiopia who made the HIV/AIDS program sustainable. Internal supportive supervision was not also regular and strong to fill the identified gaps.

Computerization fastens HMIS services but in remote hospitals it was challenged with internet interruption, falling to maintain the available software in Adama and Bishoftu hospitals as well as insufficient training, technical support and insufficient IT infrastructure and accessories made data utilization controversial for decision making.

Predictors of data utilization for decision making

Bivariate logistic regression analysis was carried out between the dependent variable, status of data utilization for decision and each independent variables under a category of employee characteristics, knowledge related variables, planning related variables, accessibility of information technology variables, and supportive supervision variables. Then only variables which had statistically significant association with data utilization in bivariate analysis were re-analyzed by multivariate logistic regression.

Accordingly knowledge on acceptable percentage of data Lot Quality Assurance Sample (LQAS), participation in planning process and getting feedback from respective HMIS unit were predictors of data utilization for decision making from the exposed variables [(at p value 0.047, AOR= 0.397, 95% CI; 0.012, 0.744), (p value 0.037, AOR=0.079, 95% CI: 0.011, 0.557) and (p value 0.001, AOR=0.003, 95% CI: 0.001, 0.021)] respectively.

Participants those have adequate knowledge on acceptable percentage of data Lot Quality Assurance Sample (LQAS) were 60.3% more likely utilize data for decision making as compared to those who have no adequate knowledge [at p value 0.047, AOR= 0.397, 95% CI; 0.012, 0.744)]. Participants participated in the planning process were 92.1% more likely use data for decision as compared to those who weren't participated inplanning [at p value 0.037, AOR=0.079, 95% CI: 0.011, 0.557]

Participants who got feedback from respective HMIS unit were 99.7% more likely utilize data for decision making as compared to those who didn't get feedback [at p value 0.001, AOR=0.003, 95% CI: 0.001, 0.021] (table 6).

Table 6: Predictors of data utilization for decision making, in selected hospitals of Oromia Region, Ethiopia

Variable		Utilization of health data		P-value	COR	AOR	95% CI for B
		Yes	No				
Level of hospital	Referral	35	49	0.208	1.921	7.753	(0.971, 55.276)
	Zonal	97	63				
Sex	Male	86	33	0.838	0.397	1.156	(0.287, 4.657)
	Female	46	69				
Service Year	<5 years	75	34	0.768	1.885	0.621	(0.026, 14.653)
	6-10 years	20	23	0.272	1.543	0.229	(0.016, 3.181)
	11-15 years	14	12	0.586	1.633	0.514	(0.047, 5.654)
	16-20 years	9	9	0.753	2.631	0.621	(0.032, 12.055)
	>20 years	14	24				
Knowledge on acceptable % of data LQAS	Yes	127	63	0.047	0.094	0.397	(0.012, 0.744)**
	No	5	39				
Participation in planning	Yes	117	45	0.037	0.063	0.079	(0.011, 0.557)**
	No	8	140				
Received updated HMIS information	Yes	81	12	0.487	0.291	1.987	(0.287, 13.770)
	No	51	90				
Feedback from	Yes	113	14	0.001	0.006	0.003	(0.001,

						0.021)**
respe ctive HMIS unit						
	No	18	89			

This study had tried to assess the knowledge of study participants, participation in planning process, accessibility of information technology, practice of supportive supervision and feedback process and how they affect trends of data utilization for decision and tried to see their association. Accordingly the study result showed that the overall status of data utilization for decision making was 56%; 81.2% of participants have knowledge on acceptable percentage of data LQAS, 36.8% of them were participated on planning process and 33.3% got feedback on their performance. This finding of this study was lower than assessment report conducted in Pakistan due to the fast automation system in Pakistan (WHO, 2015 report). There was difference in health data utilization for decision making among the studied hospitals, and the difference might be due to the provision of frequent and non-frequent training and capacity building programs, participation of employees on planning and frequent provision of feedback.

Finally findings in this study indicated that knowledge, participation in planning process and feedback on the achievement were the main predictors of data utilization for decision making. However, it has to be noted that no enough scientific literature that quantifies the extent of data utilization for decision making with similar context and content, and study was cross sectional due to that we couldn't identify temporal cause and effect relationship.

Conclusion

This study showed that data utilization among study hospitals is different from one another. There are untrained health professionals and management team members who were recruited after provision of training and not available during the training conducted due to different reasons and sufficient refreshment trainings were not provided to sustain the reform through capacity building of health professionals and management team.

Insufficient flow of feedback between hospitals HMIS unit and health care providers affected the proper utilization of data for managerial decision making.

Participation of employees in planning process creates sense of accountability and helps them to develop ability to understand vague issues that might be challenging for decision making, but in this study it was indicated that there was low participation of employees in planning process. Stake holders such at all level weren't conduct regular supportive supervisions as well as the internal supportive supervision by HMIS performance monitoring team was not regular and strong in case they don't have mandate to take corrective actions on the identified gaps, and even computer software that require maintenance delay to be acted due to late or no response from software maintainers that affected data utilization for decision making.

Additionally, lack of basic service information from registration book that was needed for service quality and incompleteness of reporting format was found to be other challenges affecting health data utilization for decision.

In general, among factors expected to affect data utilization for decision making, having knowledge on acceptable percentage of data Lot Quality Assurance Sample (LQAS), participation in planning process and feedback from respective HMIS unit were the major significant factors.

Recommendations

To improve data utilization for decision making at hospitals level, the following points were recommended

Concerned stake holders (FMOH, RHB and NGOs) should improve the knowledge of health professional and management team by giving adequate training on acceptable percentage of data Lot Quality Assurance Sample (LQAS) to strengthen data utilization for decision making by paying attention to those who did not get training, and provide frequently capacity building interventions, such as mentorship and on job coaching.

Hospital management have to involve all health care providers and management teams on planning to increase accountability, make employees part of decision making and clarify vague issues which might not be clear for them.

HMIS unit of the hospital and RHB has to provide feedback frequently according to the chain of command to measure the level of performance and identify gaps that may exist particularly by paying attention to those hospitals with low performance.

FMOH, RHB and partners including NGOs should try to make avail the required supplies and facilitate the maintenance of computer software timely.

FMOH, RHB and partners including NGOs should conduct regular supportive supervisions in order to sustain and support the reform as well as the study hospitals should strengthen their internal supportive supervision system to increase the capacity of hospital to be lead with evidences.

References

1. Hedberg and Braa (2012) The Struggle for District based Information Systems. Wilson: South Africa. The Info Soc 18: 113-127.

2. Lippeveld T, Sauerborn R, Bodart C (2010) Design and implementation of health information systems. Geneva: World Health Organization.

3. Kimberlyn M. Mc G, Charlyn B (2013) Access to data in Health Information Systems. Canada: Bulletin of WHO, 83.

4. Murray C. Frenk J (2014) A framework for assessing the Performance of Health Systems. Bulletin of the World Health Organization 85: 717-15.

5. Teklegiorgis K, Tadesse K, Terefe W, Mirutse G (2016) Level of data quality from Health management Information Systems in a resources limited setting and its associated factors, eastern Ethiopia. S Afr J Inf Manag 18: 1–8.

6. Wilson RG Smith DL (2016) Information system as social systems in developing countries. Infection disease clinic of North America 10: 247-252.

7. Ethiopia Federal Ministry of Health(2003) Health Management Information System Information (HMIS) user guideline 2nd version.

8. Ethiopia Federal Ministry of Health (2010/11) Health Sector Development Program IV.

9. Ethiopia Federal Ministry of Health (2015) Health sector transformation plan (HSTP) from 2015/16-2020.

10. Gashaw (2012) Status of Health Management Information System (HMIS) implementation in North Gonder Zone of Amhara Region, Ethiopia.

11. Peter Kintu (2015) Development of HMIS in poor countries. Uganda MoH Health policy and development 3-1.

12. Sultan Abajebel (2010) Utilization of Health Information System at District level in Jimma Zone Oromia Regional State South West Ethiopia.

13. World Health Organization, Health Metrics Network (2016) Framework and standards for country Health Information Systems. 3rd ed. Geneva.

14. WHO Regional Office for western Pacific (2010) Developing Health Management Information System, A Practical Guideline for developing Countries. Manila, Philippines.

15. WHO (2015) report. Health System Performance Assessment by the Secretariat, EB document. Geneva: 10-79.