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Utilization of Health Management Information System and Associated Factors in Hadiya Zone Health Centers, Southern Ethiopia

Ermias Abera[1*], Kidist Daniel[1], Taye Letta[2] & Desalegn Tsegaw[3]

[1] Department of Clinical Nursing, Hossana College of Health Sciences, Hossana, Ethiopia

[2] Department of Health Extension, Hossana College of Health Sciences, Hossana, Ethiopia

[3] Department of Health Information Technology, Hossana College of Health Sciences, Hossana, Ethiopia

[*] Ermias Abera, E-mail: ermiasturuse@gmail.com

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Abstract

Background: *Health Information systems are increasingly important for measuring and improving the quality and coverage of health services. Reliable and timely health information is vital for operational and strategic decision making that save lives and enhances health. In Ethiopia information quality and use remain weak, particularly at district health offices and primary health care facilities to facilitate decision making. Therefore this study will be designed to greatly signal the current status of Health Management Information System (HMIS) in study area.*

Objective: *To assess the utilization of health management information systems and associated factors at health centers in Hadiya zone, Southern Ethiopia, 2014.*

Methods: *A cross sectional study was conducted in health institutions by interviewing units/departments of health centers from April to June, 2014. Quantitative data was collected using structured questionnaires, check lists, observation and interview guide by trained data collectors. Data was analyzed using SPSS version 20 and descriptive and logistic regression analysis was carried out.*

Results: *The finding of the study revealed that utilization of health management information was 242(69.3%) in all the study units/departments of health centers. Health center units/department had key indicators (AOR=3.67; 95%CI: 2.11, 6.39), completeness of data format (AOR=3.42; 95%CI: 1.65, 7.08), consistency of data (AOR=1.91; 95%CI: 1.05, 3.48) were found to be significantly associated with utilization of health information system at 95% level of significance.*

Conclusion: *Health center units/departments had key indicators, completeness of data and consistency of data were predictors of utilization of health management information system. Therefore, in-service training and updating of staff involved in Health Management Information System (HMIS) at district, strengthening health information system inputs, timely and concrete feedbacks with establishment of functional Health Management Information System (HMIS).*

Keywords

utilization, Health Management Information System, health centers

1. Introduction

Health Information System (HIS) is defined as the system that integrates data collection, processing, reporting and use of the information necessary for improving health service effectiveness and efficiency through better management at all levels of health services (WHO, 2008). Health Management Information System (HMIS) is an information system specially designed to assist in the management and planning of health programmes, as opposed to delivery of care (Bulletin, 2005).

Currently, in Ethiopia, the emphasis of health systems development aims at the district level. Based on primary health care the district health system is supposed to be self-contained segment of the national health system and it comprises a well-defined population within a clearly delineated administrative and geographical area (MOH, 2005). The district health offices are coordinating the diversified spectrum of health services at the district level and the system contains a network of primary health units such as health centers, health posts and district hospital in some areas (WHO, 2008).

Recognizing the manifold responsibilities of the district health team and the need to allocate scarce resources, the necessity of health management based on adequate information use become obvious and crucial. The main constraint to implement the primary health care approach as reported by most countries is inadequate information for the managerial process (WHO, 2008). As commitment to health sector reform has strengthened, the realization of a good information system is necessary to support reform. Many important operational decisions were made at district level. Increased decentralization and focus on preventive and primary health care will increase the importance of decisions made at districts, moreover; a good management system at a district level increases efficiency and effectiveness of woreda level decision makers (WHO, 2001).

In literature, the terms “Health Information System” and “Health Management Information System” are used alternatively for information systems in district health systems, while the latter is becoming more popular. Both terms basically refer to the same thing. The term “Health Information System” tends to be used with more impact on the nationally organized health statistics. The term “Health Management Information System” is often used with the intention, to broaden the view towards the management impact of an information system. This term also values the need for resource management, logistics and staff information (WHO, 1987).

Data delivered through the HMIS come from service delivery and administrative records kept as part of

routine transactions at health facilities and management offices. HMIS is a core building block of the health system as a whole and provides the data needed for others, such as human resources, financing, and service delivery, to perform their functions. Many of the data sources upon which a health information system draws are also used to generate data for other sectors (FMOH, 2008; WHO, 2006, 2008).

Therefore, this study will be designed to greatly signal the current status of HMIS in study area. It can also high light the knowledge on utilization and factors associated with utilization of HMIS and perhaps as an initiative and reference to other researchers in this area. Further, in line with these, it will also contribute to policy decision making in the direction of making Health Management Information System (HMIS) more amenable for better improvement of the health services.

2. Methods

2.1 Study Design and Area

Facility based cross sectional study was conducted from April to June, 2014 to assess the utilization of health management information systems and associated factors in Hadiya zone health centers. Hadiya zone is located in the Southern Nation National Regional State of Ethiopia. Hossana, the capital town of the zone which is located 232 kilometers far from Addis Ababa. In zone, there are 1 general hospital, 4 primary hospitals, 10 woreda health offices, 2 town administration, 61 health centers, and 305 health posts.

2.2 Source and Study Population

Sample was obtained from health professionals in Hadiya zone health facilities. All randomly selected units/departments representatives in government health centers were included in the study. However, those who were absent from their units/departments during data collection time were excluded from the study.

2.3 Samples Size Determination

The sample size was calculated using single population proportion with the following assumptions. P=32.9% (the utilization of health information system at district level in Jimma zone) (Abajebell, 2011), marginal error (d) of 5%, confidence interval of 95% and $Z\alpha/2$ is the value of the standard normal distribution corresponding to a significant level of alpha (α) of 0.05, which is 1.96. This yields a sample size of 339. Adding 5% for non-response rate, the total sample size was **356**.

2.4 Sampling Procedures

Study subject was selected by using systematic random sampling techniques until the required sample size was fulfilled from the prepared sampling frame. Starting from a random point (1-K^{th} by lottery method) from the sampling frames, every K^{th} element in the frame was selected at equal intervals (sampling interval) from proportional allocated numbers for each woreda and town administrative health centers. Accordingly, 356 samples were collected from 10 woreda health centers and one city administrative health center.

2.5 Data Collection Procedures

Quantitative data was collected using pre-tested and standardized questionnaire. Questionnaire was developed after revision of relevant literatures. The questionnaires were pre-tested in a similar study population in kembataTembaro zone taking five percent of the actual sample size before the final work and appropriate measures were taken before it is finalized.

A face-to-face interview was conducted using structured questionnaire and observational checklist in the study units/departments to identify how data and information is generated like observation of registration books, monthly and annual reports, and graph, charts and Maps in the health institutions.

Eleven health professionals' were recruited for data collection and three MPH holders were recruited to supervise the overall data collection processes. Two days training were given to all data collectors and supervisors to have common understanding on data collection process.

The data was thoroughly cleaned and carefully entered in to computer for beginning of analysis. Before analysis, data was cleaned carefully; missing values were handled not to be excluded in analysis by checking again and again through data exploration.

2.6 Data Processing and Analysis

After data collection, each questionnaire was checked for competence and code was given before data entry. Data was cleaned and entered into computer by using EPI Info version 3.5.3 and the analysis was done using SPSS version 20.Data was edited and cleaned before data analysis. Frequency, percentage and descriptive summaries were used to describe the study variable. Variables with p-value≤0.2 in the bivariate analysis were transferred into multivariate logistic regression analysis to control the effect of confounders. Backward binary logistic regression was carried out to identify factors associated with utilization of health information system. Finally adjusted odds ratios with their 95% confidence intervals and explanatory variables with p-value of 0.05 were considered to have significant association with the outcome variable.

2.7 Ethical Consideration

Ethical clearance was obtained from the ethical clearance committee of Hossana Collage of Health Sciences. A formal letter, from Hossana Collage of Health Sciences was submitted to Hadiya zone health office, woreda health offices and health centres. All participants' right to self-determination were respected. All study participants were informed about the purpose of the study and any additional information were given in written form.

3. Results

3.1 Human Attributive Factors

The sex distribution of individuals working in the study units showed that 178(51%) were females while 171(49%) were males. Among the total 217(62.2%) were within the age of 25-30 years old with a mean age of 26.51 years and standard deviation of 3.76 years, 180(51.6%) of them have a salary ranging from 1000-1500 ETH.BIRR and 166(47.6%) of them also have 3-5 year of services.

Table 1. Socio-Demographic Characteristics of Health Workers in Hadiya Zone Health Centers, Southern Ethiopia, 2014

Variables	N	%
Salary		
1000-1500	180	51.6
1501-2000	124	35.5
2001-2500	35	10.0
>=2501	10	2.9
Sex		
Male	171	49.0
Female	178	51.0
Age of respondents		
19-24	100	28.7
25-30	217	62.2
≥31	32	9.1
Service years		
1-2	100	28.7
3-5	166	47.6
≥6	83	23.8

Regarding to profession, from total interviewed health officers accounts, 33(9.5%), nurses all type accounts, 219(62.8%), midwifery nurses accounts, 72(20.6%), laboratory technicians accounts, 11(3.2%), pharmacies accounts, 13(3.7%) and environmental health accounts, 1(0.3%).

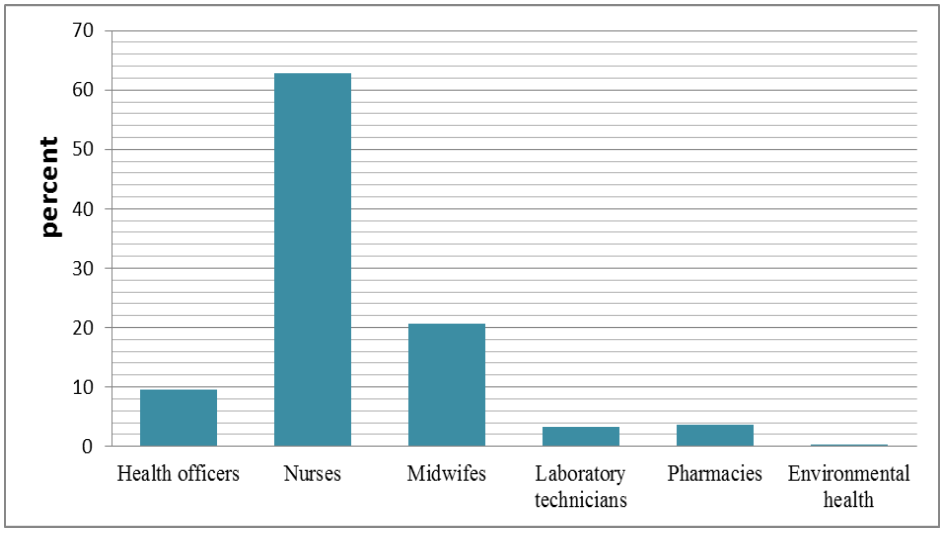

Figure 1. Health Professional's Distribution in Hadiya Zone Health Centers, 2014

3.2 Organizational Factors

Most of the units/departments, 346(99.1%) had prepared reports to district health office on monthly, quarterly and annual basis. Most of units/departments, 305(87.4%) had received feedback from district health office on monthly, quarterly and annual basis. More than half of every unit/department, 295(84.5%) had data collection standards including case definitions. Most of units/departments, 323(92.6%) were present information to, and discus with facility management and community. In the past three month of data collection time, most of the units/departments, 271(77.7%) were supervised one to two times.

More than half of units/departments, 228(65.3%) had Health Information System (HIS) multi-disciplinary committee for the all over all design and direction users of information. Also more than half of units/departments, 216(61.9%) had health information steering committee to set the long-term goals for HIS and needs to decide which key indicators should be measured and which data are necessary. Among the total of 349 participants, 124(35.5%) were ever trained and 29(8.3%) had received in service training after every 6 months about HMIS.

Among the total of units/departments, 156(44.7%) were use data to calculate area coverage for essential services and prepare Maps. Most of units/departments, 318(91.1%) were adapted national target to local situation. Among the total of units/departments, 252(72.2%) had key indicators with charts, tables, etc.

Table 2. Organization Factors Affect Health Management Information System Utilization in Hadiya Zone Health Centers, Southern Ethiopia, 2014

Variables	N	%
Received feedback from district health office		
Yes	305	87.4
No	44	12.6
Feedback of supervise within 3 months		
0	15	4.3
1-2	271	77.7
≥3	63	18.1
Discus with facility management and community		
Yes	323	92.6
No	26	7.4
Had HIS multi- disciplinary committee		
Yes	228	65.3
No	121	34.7
Had health information steering committee		

Yes	216	61.9
No	133	38.1
Have data collection standards including case definitions		
Yes	295	84.5
No	54	15.5
Ever trained		
Yes	124	35.5
No	225	64.5
In-service training		
Yes	29	8.3
No	320	64.5
Calculate area coverage		
Yes	156	44.7
No	193	55.3
Adapt national target to local situation		
Yes	318	91.1
No	31	8.9
Had key indicators		
Yes	252	72.2
No	97	27.8

3.3 Characteristics of Data

Most of the units/departments, 346(99.1%) had prepared reports to district health office on monthly, quarterly and annual basis. Most of the units/departments, 288(82.5%) were aggregate daily service like tallies. Data collection tools (tallies, report formats of monthly, quarterly, reporting forms and registrations) 331(94.8%) were filled manually in all the study units/departments. From the total interviewed, 346(99.1%) staff of health centers reported monthly/quarterly they filled the format properly. The rest complains that they did not understand the tools/formats due to non-understandability, ambiguity and they didn't have any training supports. Among the total of participants 164(47%) were provide their reports to case team representatives, 115(33%) were provide their reports to health centers head and 70(20%) were provide their reports to HMIS focal persons. Most of units/departments, 294(84.2%) had data transmission, processing, and reporting rules. But more than half of units/departments, 202(57.9%) had no training design and standards.

Among the total units/departments, 208(59.6%) were submit report within 20-24 days, 126(36.1%) were submit report within 25-28 days and 15(4.3%) were submit report more than or equal to 29 days. Among the total units/departments, 289(82.8%) were complete data correctly and 265(75.9%) were found consistency of data with register book, tally sheet and reporting formats.

Table 3. Health Management Information System Data Characteristics in Hadiya Zone Health Centers, Southern Ethiopia, 2014

Variables	N	%
Aggregate daily service like tallies		
Yes	288	82.5
No	61	17.5
Departments had prepared reports		
Yes	346	99.1
No	3	0.9
Report submission system		
Case team	164	47.0
HC heads	115	33.0
HMIS Focal	70	20.0
Had data transmission, processing, and reporting rules		
Yes	294	84.2
No	55	15.8
Report submission date		
20-24	208	59.6
25-28	126	36.1
≥29	15	4.3
Completeness of data		
Yes	289	82.8
No	60	17.2
Consistency of data		
Yes	265	75.9
No	84	24.1

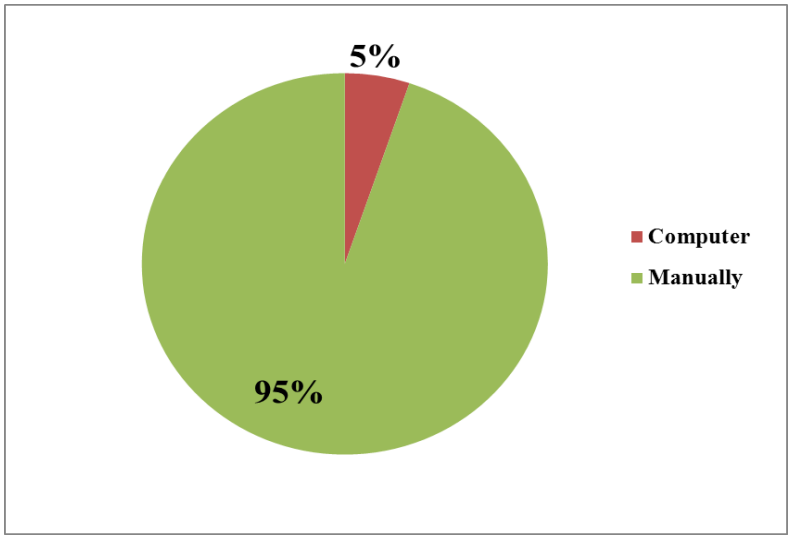

Figure 2. Data Documentation of Reports and Registration Books at the Health Centers in Hadiya Zone, 2014

3.4 Utilization of HMIS

A total of 349 heads of the units/departments composed from 61 health centers were participated in this study with response rate of 98.03%. The finding of the study revealed that utilization of health management information system was 242(69.3%) in all the study units/departments.

Those who had key indicators with charts and tables than no (AOR=3.67; 95%CI: 2.11, 6.39), those who filled data formats completely than didn't (AOR=3.42; 95%CI: 1.65, 7.08) and who had claimed consistency of data with register book, tally sheet and reporting formats than no (AOR=1.91; 95%CI: 1.05, 3.48) were more likely utilize health management information systems in their health centers.

Table 4. Multivariate Analysis of Factors Associated with Utilization of Health Management Information Systems in Hadiya Zone Health Centers, Southern Ethiopia, 2014

Variables	Utilization of HMIS		Crude OR(95%CI)	Adjusted OR(95%CI)	P-value
	Yes	No			
Had key indicators					
Yes	199	53	4.72(2.85,7.79)	3.67(2.11,6.39)	0.001*
No	43	54	1	1	
Completeness of data					
Yes	225	85	5.90(3.11,11.21)	3.42(1.65,7.08)	0.001*
No	38	22	1	1	
Consistency of data					
Yes	199	66	2.87(1.73,4.79)	1.91(1.05,3.48)	0.035*
No	43	41	1	1	

*P-value from multivariate analysis, Hosmer-Lemshow's, p-value=0.165.

4. Discussion

Health management information systems help globally to develop the culture of evidence based policy making to identify issues; inform the design and choice of policy; forecast the future; monitor policy implementation; and evaluation policy impact.

This study had tried to assess the utilization of health management information system at health centers level. In addition, the study had also tried to see the associations between utilization of HMIS and the basic socio-demographic variables such as level of education, salary, age, and year of services and some other important key factors which may affect the utilization of information at each level.

In this study, based on the criteria set in the operational definition the utilization rate of HMIS was found to be 69.3% units. Which was higher as compared to the study done in Ghana 10%, Uganda 20%, North Gondar Ethiopia 22.5% and the study conducted in Jimma Ethiopia (Abajebell, 2011; Adargie, 2007; Campbell, 1996; Peter, 2005; Wiley, 2008). The survey study conducted by Essential Services of Health for Ethiopia in Amhara regional state reported that utilization of information at district and health facilities level was partial and uneven (ESHE II, 2004). The increment in this study was due to frequent supportive supervision, provision of training and follow-up down to the health centers.

In our study those who had key indicators with charts; tables were more likely to be utilized health management information systems as compared to those who had no key indicators with charts, tables. This finding was supported study done in Jimma zone shows that units having charts on the prevalence of malaria is more likely to utilize health management information system (Abajebell, 2011). This might be due to the presentation of data becomes important; depending on the nature of the data and decisions to be taken, a table, graph or map may be most revealing of the situation (FMOH, 2007). Information display is helpful for clients, health professionals and managers to understand and keep in mind their status in their day to day activities (FMOH, 2013).

In our study, those who were filled the data format completely were more likely to be utilized health management information systems as compared to those who were not filled data format completely. Other literatures showed that where the incompleteness of Health Management Information System (HMIS) contributes to the failure to use data as the basis for informed decision making in planning and management at all level of health sectors (Geeorge, 2005; ESHE, 1995). To persuade health professionals to fill data at primary source of recording and reporting administrative levels need to clearly show the relevance of each column and space to be filled in light of their contribution to assist diagnosis, treatment, and counseling, continuum of care, program improvement and resource allocation. The possible justification for this might be the reason that complete information can be a base for making decision based on the available data as well as the department considers all the data as relevant to be used.

Those who had claimed consistency of data with register book, tally sheet and reporting formats were more likely to be utilized health management information systems than those who had claimed

inconsistency of the reports. Data that is compiled in register and reporting forms should be accurate and reflect no inconsistency between what is in the registers and what is in the reporting forms at facility level. The cause of data discrepancy might be due to attributable to incompleteness of data, missing source documents, not understanding the definition of cases or data elements, data entry errors or data may not fall within the reporting period (FMOH, 2013).

Even though this study has identified many factors that associated with utilization of health management information systems in health centers it was not free of biases due to many data were stored manually that was increased missing data.

5. Conclusion

In general the findings of this study showed that units/departments had key indicators, completeness of data and consistency of data were found to be significantly associated with utilization of health information system at 95% level of significance. Therefore, in-service training and updating of staff involved in Health Information System (HIS) at district, strengthening health information system inputs, timely and concrete feedbacks with establishment of functional Health Management Information System (HMIS).

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