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Health Information Use and Associated Factors in Health Facilities of Iluababor Zone, Southwest Ethiopia: A community-based cross-sectional study

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ABSTRACT

Objectives: Using reliable information over time is an important aid in improving health outcomes, tackling disparities, enhancing efficiency, and encouraging innovation. Studies on the level of health information use among health workers at the health facility level in Ethiopia are limited. This study was designed to assess the level of health information use and contributing factors in Iluababor zone health facilities.

Methods: A facility-based cross-sectional study was conducted from June to August 2020 among 392 health workers in health centers in the Iluababor zone, southwest Ethiopia. Data was collected using a pretested, self-administered questionnaire. Collected data was cleaned, coded and entered into Epi Data version 3.1 and analyzed by SPSS V20. A multivariable logistic regression analysis was used to identify determinant factors.

Results: It is found that 65.8% of the service units used health information. Use of HMIS standard materials (AOR = 8.10; 95% CI: 3.51–16.58), training on health information (AOR = 8.31; 95% CI: 4.34–14.90), completeness of report formats (AOR = 10.24; 95% CI: 5.0–15.14), and age (AOR = 0.4; 95% CI: 0.2–0.77) were found to be significantly associated with health information use.

Conclusion: Health information utilization was low compared to the national standard, which was above 78%. Completeness of report format, training, use of standard HMIS materials and age were significantly associated with health information utilization. Efforts should be made by the Zonal Health Department to strengthen supportive supervision at all levels and ensure the availability of standard reporting formats to increase health information utilization.

KEYWORDS: *Ethiopia, factors, health information, health facilities, utilization*

Strengths and limitations of this study

- The key components of health information were used to quantify information use.
- Health leaders were not included in the study.
- Qualitative data were not used to support the findings.
- A cross-sectional study design cannot affirm any causal inference or direction of the association.

INTRODUCTION

Sound and reliable health information is the foundation of decision-making across all health system building blocks and is essential for health system policy development and implementation, governance, and regulation [1]. Health information is becoming increasingly important for measuring and improving the quality and coverage of health services, and is considered fundamental to the efficient delivery of high-quality health care [2,3]. Data delivered through the health management information system comes from service delivery and administrative records kept as a part of routine transactions at health facilities and management offices [1,3].

For information to be used effectively, it must be available, accessible and of high quality, with knowledge of its applications, and be user-friendly [4]. Implementation of health information is the backbone for planning and management of health services at district levels as it can play an important role in effective and efficient health service delivery, decision making, and the improvement of the program [5]. Poor health information utilization indicates inefficient and ineffective resource utilization, especially in developing countries [6].

Significant human and financial resources are being invested in improving health information at the health facility and district level, particularly in developing countries [7]. The 2015 sustainable development goals within the context of universal healthcare coverage have emphasized measurement and accountability, which can only be achieved through a vibrant national health information system aligned to the five-point call to action in measurement at the Washington summit of June 2015 [8]. However, the health information systems are unnecessarily fragmented and not harmonized during data management at health facilities though the ministry of health of different countries have formulated different policies [9].

A major issue facing Africa is its inability to quantify and analyze the situation it faces with credible data and to use the information in planning and managing service delivery [9]. The poor performance is caused by an inability to implement health system improvement policies and strategies as a result of deteriorating socio-economic situations, made worse by inadequate information systems for evidence-based management of the health system [10].

Studies across Africa showed that the effective use of the information health system was only 48.1%. which indicated low planning and performance of health outcomes and low budget allocation [11].

Studies conducted across Ethiopia revealed suboptimal health information utilization by health profesionals[12]. The proportion of health information use ranges from 32.9% in Jimma zone[3] to 57.8% in Amhara region [6]. The proportion of good health information utilization was 51.3% and 42.1% among primary healthcare units and health posts, respectively[2,3,6]. Out of 84.3% of data collected daily, only 22.5% of them were utilized, changing data into information at the district and facility level and using it for immediate decision making [6,7].

Age, lack of user involvement, inadequate knowledge of how to use health information systems, understaffing, and a lack of refreshment training are all factors that influence health information system utilization[13,14]. Data requirements are frequently chosen without taking into account the technical skills of the health workers collecting the data or the available diagnostic equipment in peripheral health facilities [15–17].

On the other hand, data quality is lacking due to a lack of motivation among health services personnel and an absence of feedback for health service supervisors and peripheral health workers on the data reported to the higher level [18].

Different studies conducted at the health facility level in Ethiopia revealed suboptimal health information utilization practices, but the studies didn't consider different working units within these facilities where health information services are actually practiced. Even though improving healthcare data quality and utilization at facility levels has become a primary agenda (currently, the information revolution is one of the transformation agendas at the primary level for the Ethiopian government), the magnitude of optimal utilization of health information among health professionals is unclear. Hence, this study can serve as a

baseline to improve the implementation and utilization of health information in health facilities and conduct further studies.

Study objectives

This study was designed to determine health information use and associated factors among health workers in health facilities in Iluababor zone, Southwest Ethiopia.

METHODS

Study design and setting

An institution-based cross-sectional study was conducted among 400 health workers selected from 40 public health centers in the Iluababor zone, southwest Ethiopia, from June to August 2020. The Iluababor zone is one of the Oromia region's 20 zones. It is located 600 kilometers southwest of Addis Ababa, the capital city of Ethiopia. There are 40 functional health centers and 14 woreda health offices, and there are 574 units/departments using the health management information system (HMIS) as a routine data management tool. In the Ethiopian context, Woreda is a local administration containing at least 60,000 people, and it is then divided into kebele (the lowest administrative level), which contains about 5000 people.

Study participants

The study included service delivery point heads in health centers found in the Ilu Aba boor zone. The study population consisted of health workers who were in charge of 15 service delivery points at the health center level. Health workers from service delivery points that had not implemented HMIS at the health center level during the study period were excluded.

Sample size and sampling techniques

The sample size was calculated using the single population proportion formula, n = (za/2)2p(1-p)/d2, with the following assumptions in mind: 38.4% proportion of health information utilization (p) at East Wollega[19], with a 95% level of confidence, a 5% margin of error, and a 10% non-response rate. Finally,

a maximum sample size of 397 was obtained. There are forty (40) health centers in the Ilubabor zone. Twenty-seven (27) health centers were included in the study. Fifteen participants from each health center that is intended to use the HMIS were considered, which included triage, outpatient department, emergency, laboratory service, pharmacy, family planning, antenatal care, delivery care, postnatal care, EPI, under five-year OPD, inpatient unit, ART clinic, TBL clinic, and youth-friendly service. One health worker from each of the fifteen service delivery points was selected by a simple random sampling technique from all the forty health centers included in the study.

Data collection tools and procedures

A pretested self-administered questionnaire and an observation checklist were used to collect data. Socio-demographic descriptions, knowledge and practice of data management and use, the purpose of information use, and factors affecting health information use were major questionnaire contents. The questionnaire was compiled from the related literature [3,6]. Four data collectors (nurses) and one supervisor (public health professional) participated in data collection. Training the data collectors/supervisors, providing supportive supervision, and making study participants clear on study objectives were activities to ensure data quality.

In this study, utilization of health information was assessed in terms of using information for decision-making in management and clinical services by using 5 item questions. These were: using information for decision making to take immediate action; getting feedback from respective supervisors; calculation of area coverage and preparation of maps; presence of key indicators with charts or using HMIS materials (indicators were not expected to be the same, they varied from one unit to the other unit) and presentation of achievements of targets at the last health center and woreda team minutes or using Lots Quality Assurance Score (LQAS) sample. Accordingly, service delivery units/departments were considered to be utilizing health information systems when they were practicing at least three of the five criteria listed above; otherwise, they were considered to not be utilizing health information [3,18]. Health information is defined as healthcare data that has been organized in a meaningful format, aggregating information about all patients and other relevant information for patients or clients, as well as for overall

services. The service unit head is the individual assigned to a service unit category in a health center, starting with the PHCU director.

Data management and analysis

The data was entered into Epi-data version 3.1 and exported to SPSS version 20 for further analysis. Descriptive statistics, including frequencies and proportions, were computed. Crude and adjusted odds ratios were computed using a logistic regression model to summarize the association. To identify the associated factors, variables with a p-value of less than 0.25 in the bi-variable analysis were entered into the multivariable logistic regression analysis for further analysis. Finally, an adjusted odds ratio (AOR) with 95% confidence intervals was computed to show the strengths of associations. Then, a p-value of less than 0.05 with multivariable logistic regression analysis was used to identify variables significantly associated with the utilization of health information. The model fitness was checked by the Hosmer and Lemeshow goodness of fit test.

Patient and Public Involvement

Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

RESULTS

Socio-demographic characteristics of health workers in Iluababor zone health centers

A total of 392 units were included in the study, with a response rate of 98%. The mean (standard deviation) age of the respondents was 28.84±6. The ages ranged from 22 to 53. One hundred twenty (30.6%) were BSC nurses, 27.3% were health officers, 16.8% were clinical nurses, 16.3% were laboratory professionals, and pharmacists made up 8.9%. More than half (51.3%) of the health workers had served for more than 10 years. The majority (76.8%) of the health workers were married, and the majority (84.1%) of them earned more than 2800 ETB per month (Table 1).

Table 1: Socio-demographic characteristics of health workers at units in Health centers in Iluababor Zone, southwest, 2020.

Variable	Categories	Frequency	Percent (%)
Age	Below 30 years	250	63.8
	Above 30 years	142	36.2
Monthly salary	2001-2400	1	0.4
	2401-2800	72	18.4
	>2800	319	81.41
Professional category	Health officer	107	27.3
	BSc Nurse	120	30.6
	Diploma Nurse	66	16.8
	Laboratory	64	16.3
	Pharmacist	35	8.9
Service year	Below five years	85	21.7
	5-10 years	106	27
	Above 10 years	201	51.3
Marital status	Never married	91	76.8
	Ever married	301	23.2

Institutional characteristics of health centers in Iluababor zone

The majority (93.9%) of health workers in health centers were supervised once, and only 3.3% of them were supervised twice in six months. More than half (69.1%) of the respondents did not receive regular feedback from the next higher health authority. Majority (88%) of the service units reported activities timely. Regarding training, the most (60.7%) of the respondents had received training on data analysis and management, but 38.3% were not performing the lot quality assurance score (LQAS) (Table 2).

Table 2. Institutional characteristics of health centers in Iluababor zone, southwest Ethiopia, 2020

Variables	Category	Frequency	Percent
Supportive supervision	Once	368	93.9
	Twice	11	2.8
	Above two	13	3.3
Training	No	154	39.3
	Yes	238	60.7

Change data to information	No	203	51.8
	Yes	189	48.2
Uses for long term decision	No	94	24.0
	Yes	298	76.0
HMIS standard materials	No	149	38.0
	Yes	243	62.0
Received feedback	No	121	30.9
	Yes	271	69.1
Reporting schedule	Not timely	47	12.0
	Timely	345	88.0
Discussion about data (checking minutes)	No	161	41.1
	Yes	231	58.9
Completeness of report format	Yes	242	61.7
	No	150	38.3
Health information	Utilized	258	65.8
	Not utilized	134	34.2

Health information use among health service delivery units in health centers of Iluababor zone

One hundred forty-nine (38%) of the service delivery units didn't have standard HMIS materials. On the other hand, 46.7% of the respondents indicated that they faced a lack of key indicators in charts and tables during the utilization of health information and during data collection, 39.5% of them had no tools. On the other hand, reports were incomplete in 38% of the service delivery units (Figure 1).

In this study, 258 (65.8%) of the service delivery units and departments health centers in Iluababor zone used health information (95% CI: 61%–71%), while 34.2% did not (Figure 2).

Health information was utilized by the majority of the service delivery units in the studied health centers. The least was among the youth-friendly service unit, which was 4.6% (Table 3).

Table 3. Utilization of health information at health center level by service delivery units participated in Iluababor zone, 2020

Service unit	Total participated n (%)	Health information Utilized, n (%)	Not utilized, n (%)
EPI	24(12.17)	16(6.2)	8(5.97)
Antenatal care	27(14.04)	17(6.58)	10(7.46)
Admission	26(13.29)	17(6.58)	9(6.71)
ART/VCT clinic	26(13.29)	17(6.58)	9(6.71)
Delivery	27(13.68)	18(6.97)	9(6.71)
Emergency	27(13.68)	18(6.97)	9(6.71)
Family planning	27(13.68)	18(6.97)	9(6.71)
Laboratory	27(13.68)	17(6.58)	10(7.46)
TB-leprosy clinic	27(13.68)	18(6.97)	9(6.71)
Triage	27(13.68)	18(6.97)	9(6.71)
Out patient department	27(13.68)	18(6.97)	9(6.71)
Pharmacy	27(13.68)	18(6.97)	9(6.71)
Postnatal care	27(13.68)	18(6.97)	9(6.71)
Under five OPD	27(13.68)	18(6.97)	9(6.71)
Youth friendly service	19(9.87)	12(4.65)	7(5.22)
Total	392(100)	258(65.8)	134(34.2)

* significant at p-value < 0.05 CI: confidence interval COR: crude odds ratio AOR: adjusted odds ratio

Factors associated with utilization of health information

Based on multivariable logistic regression analysis, the content of completeness of report format, training on health information, use of standard HMIS guidelines, and age were found significantly associated with utilization of health information among servie units of health. Accordingly, the odds of using health information among health workers who had training were eight times higher compared with those without training (AOR = 8.31; 95% CI: 4.34–14.90). Also, the odds of using health information among health workers in units having standard HMIS guidelines were eight times higher than their counterparts (AOR =

8.10; 95% CI: 3.51–16.58). In addition, the odds of health workers in units with complete service reports were ten times higher than those with incomplete report formats (AOR = 10.24; 95% CI: 5.0–15.14). Furthermore, health workers whose age was above 30 years were 60% more likely to use health information than those below 30 years (AOR = 0.4; 95% CI: 0.2–0.77) (Table 4).

Table 4. Factors associated with health information utilization at service units of health centers in Iluababor zone, southwest Ethiopia, 2020.

Variable		Health information use		COR (95% CI)	AOR (95% CI)
		Yes (%)	*No (%)*		
Age	<=30	157(62.8)	93(37.2)	0.68(.44,1.07)	0.4(0.2,0.77)*
	>30	101(71.1)	41(28.9)	1	1
Received feedback	Yes	145(63)	85(37)	0.74(0.48,1.14)	0.66(0.34,1.26)
	No	113(69.8)	49(30.2)	1	1
Number of supervision	Above two	11(84.6)	2(15.4)	2.9(0.65,13.60)	0.5 (0.03,8.61)
	Twice	8(72.7)	3(27.3)	1.44(.38,5.52]	0.41(.04,4.07)
	Once	239(64.9)	130(35.1)	1	1
Content completeness of report format	Yes	207(85.5)	35(14.5)	11.5(7.02,18.8)	10.24(5.0,15.14)*
	No	51(34)	99(66)	1	1
Training	Yes	197(82.8)	41(17.2)	7.3(4.6,11.68)	8.3(4.34,14.90)*
	No	61(39.6)	93(60.4)	1	1
uses of standard HMIS tools	Yes	196(80.7)	47(19.3)	5.8(3.71,9.23)	8.10(3.51-16.58)*
	No	62(14.6)	87(58.4)	1	1
uses of Catchment map	Yes	104(62.3)	63(37.7)	0.7(0.50,1.16)	0.82(0.39,1.69)
	No	154(68.4)	71(31.6)	1	1
Local decision	Yes	111(58.7)	78(41.3)	0.54(0.36,0.83)	1.68(0.83,3.42)
	No	147(72.4)	56(27.6)	1	1
Availability of Documentation	Yes	209(68.2)	68(31.9)	2.25(0.96,2.56)	0.57(0.27,1.21)
	No	49(57.6)	36(42.4)	1	1

* significant at p-value < 0.05 CI: confidence interval COR: crude odds ratio AOR: adjusted odds ratio

DISCUSSION

Health Information System is a system that integrates health data collection, processing, reporting, and use of the information necessary for improving health service delivery, effectiveness and developing

efficiencies in the reporting systems. Without reliable and appropriate health information system, healthcare managers and service providers cannot improve the quality of health services. The Ethiopian Federal Ministry of Health emphasized HMIS as a key to the successful implementation of the Health Sector Transformation Plan (HSTP) and achieving the Sustainable Development Goals [6]. Considering this initiative, the Ethiopian Health Sector Strategic Plan underlined that routine data generated at district health facilities should be considered as the entrance to utilizing health information as a primary source of information for continuous monitoring of health services in the country and that data should be utilized at the place where it was generated [2]. The study aimed to assess health information utilization and its associated factors in Ilu Aba boor zone health centers. In this study, 65.8% (95%CI: 61%-71%) of the units of health centers demonstrated health information utilization. This study was inline with the study conducted at Hadya (69.3%) [20] and in East Wollega (66.0%) [19]. This might be due to the similarity between population structure and the health information generating system at health centers. But this study was higher than the study conducted in Kenya at 48.1%[11], in North Gonder at 38.4% [6], in East Gojam at 45.81% [21], and in Jimma at 32.9% [3]. The variation might be due to study design, sample size and due to emphasis given to training on HMIS to build the capacity of staffs on health information utilization at the study area and the time difference among the studies.

Identifying factors that affect utilization of health information is very important to improve healthcare services. In this study, use of standard HMIS materials like registers and tall sheets is eight times more likely to contribute to the utilization of health information than those not using standard materials from HMIS. This finding is supported by a study conducted in North Gonder [6], which showed using HMIS materials improves utilization of health information. The possible explanation for this is that if the standard HMIS materials are available at health facilities there is the likelihood of utilization of health information and without these materials it is even difficult to generate health information.

Likewise, completeness of report format was ten times more likely to increase utilization of health information than those units with incomplete report formats. This study is in line with a study conducted in Hadya zone [20] that indicated the association and contribution of completing a format report to health information management and utilization. The possible explanation for this is that complete reports will lead to health information and aid in decision-making or utilization of information.

Health workers who had taken HMIS training were eight times more likely to utilize health information than those who are not trained in HMIS. These findings were supported by studies conducted in East Gojam [21] and North Gondar [7]. This is due to the fact that training improves data generation, compliance, and decision-making through utilization of health information.

Health workers who were younger (aged less than 30 years) were approximately 60% less likely to utilize health information than those of age above 30 years. This study contradicts studies in Harar [22] and the USA [23]. The possible explanation for the variation could be the fact that health workers who are below 30 years are usually beginners so that new health professionals are unfocused on health information rather than clinical services and do not actively participate in generating data and information using standard HMIS materials.

Therefore, giving continuous in-service training and updating of the staff on health information at health centers and departments of health centers, continuously supporting HMIS materials and testing by LQAS tools to ensure all indicators are completely filled in the report format for utilization of health information national wise Improving the completeness of the report format, training on health information and the use of HMIS standards of materials are crucial to solving the gap. Since the use of health information was based on self-reported data, it could be subjected to recall bias. This study is limited to service delivery points in health faciliites. Further studies supported by qualitative methods and including different stakeholders from health offices is recommended

CONCLUSION

This study concluded that utilization of health information in health centers found in Iluababor was low, compared to the national cut-off point (above 78%) [1]. Age of health workers, completeness of report format, use of standard HMIS tools, and training on HMIS data use were the identified factors associated with health information utilization at the health center's service delivery units. Improving users' data management inputs, training for all health workers, and availing and using standard HMIS tools is important to improve health information use in health centers.

Contributors

DN and AZ were involved in the conception of the study. DN, GH, AM and AZ were involved in the methodological design, data acquisition, analysis and interpretation. AZ wrote the first and revised drafts of the manuscript. All authors were involved in the final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. AZ is responsible for the overall content as the guarantor.

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Competing interests: None declared.

Patient consent for publication: Not applicable.

Ethics approval

This study involves human participants and was approved by the ethical review committee of the College of Health Science, Mettu University (approval number RCS/019/2019) and presented to Iluababor zone health Deaprtment and respecrive distrcit health offices. An official letter was obtained from District health office and presented to the respective health facilities. The purpose and importance of the study were explained to the study participants, informing them of the right to withdraw at any time during the study period. Health workers were give the questionnaire after verbal consent was obtained and the privacy and confidentiality of participants. Any personal identifier were not included in the questionnaire. The participants gave informed consent to participate in the study before taking part.

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Data availability statement

The data sets used or analysed in this study are available from the corresponding author upon reasonable request.

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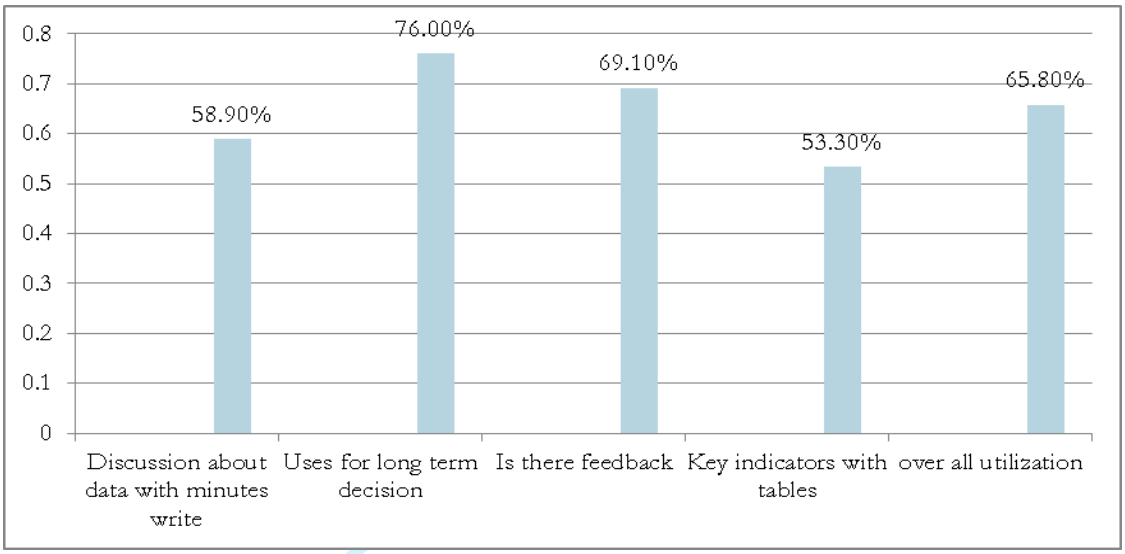
Figure Legends

Figure 1. The proportion of the components of health information utilization among health centers in Iluababor zone, southwest Ethiopia, 2020

Figure 2. Utilization of Health Information at health centers in Iluababor zone, Southwest Ethiopia, 2020



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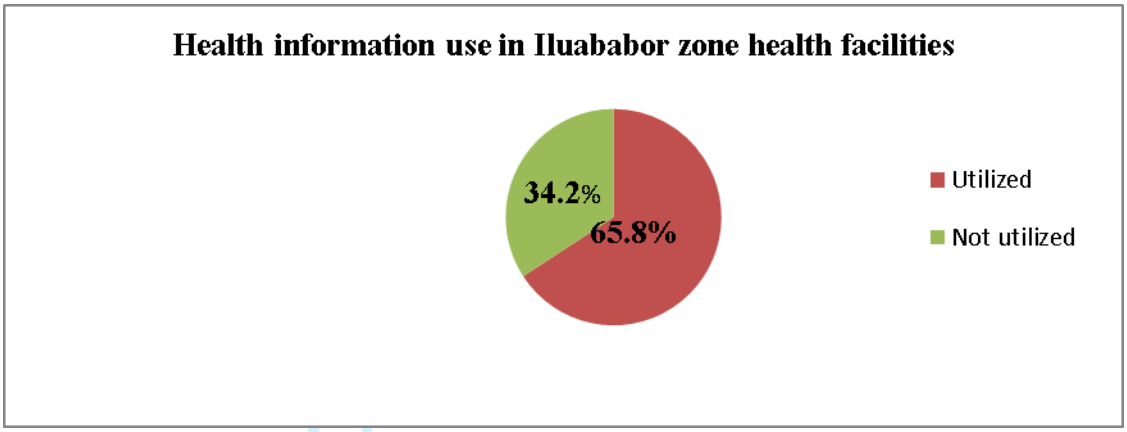

Figure 2. Utilization of Health Information at health centers in Iluababor zone, Southwest Ethiopia, 2020

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	5
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*6*
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	7
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	8
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	12

		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Health information use and associated factors among healthcare professionals in Iluababor Zone, Southwest Ethiopia: An institution-based cross-sectional study

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ABSTRACT

Background: Health information systems are essential for collecting data for planning, monitoring, and evaluating health services. Using reliable information over time is an important aid in improving health outcomes, tackling disparities, enhancing efficiency, and encouraging innovation. Studies on the level of health information use among health workers at the health facility level in Ethiopia are limited.

Objectives: This study was designed to assess the level of health information use and associated factors among healthcare professionals.

Methods: An institution-based cross-sectional study was conducted among 397 health workers in health centres in the Iluababor zone of southwest Ethiopia, who were chosen using a simple random sampling technique. Data were collected using a pretested, self-administered questionnaire and an observation checklist. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting checklist was used to report the summary of the manuscript. Bivariable and multivariable binary logistic regression analysis was used to identify the determinant factors. Variables with a p-value < 0.05 at 95% confidence intervals were declared significant.

Results: It was found that 65.8% of the healthcare professionals had good health information utilization. Use of HMIS standard materials (AOR = 8.10; 95% CI: 3.51–16.58), training on health information (AOR = 8.31; 95% CI: 4.34–14.90), completeness of report formats (AOR = 10.24; 95% CI: 5.0–15.14), and age (AOR = 0.4; 95% CI: 0.2–0.77) were found to be significantly associated with health information use.

Conclusion: More than three-fifths of healthcare professionals had good health information utilization. Completeness of report format, training, use of standard HMIS materials, and age were significantly associated with health information utilization. Ensuring the availability of standard HMIS materials and report completeness and providing training, particularly for newly recruited health workers are highly recommended to enhance health information utilization.

KEYWORDS: *Ethiopia, factors, health information, health facilities, utilization*

Strengths and limitations of this study

- The key components of health information were used to quantify information use.
- The study included health workers from all primary public health facilities.
- Qualitative data were not used to support the findings.
- Self-reported bias might have been introduced, which may overestimate the level of information use.

INTRODUCTION

A health information system is a system that integrates health data collection, processing, reporting, and use of the information necessary for improving health service delivery, effectiveness, and developing efficiencies in the reporting systems (1). Without a reliable and appropriate health information system, healthcare managers and service providers cannot improve the quality of health services (1,2).

Health information is healthcare data that has been organized in a meaningful format, aggregating information about all patients and other relevant information for patients or clients, as well as for overall services (2,3). Sound and reliable health information is the foundation of decision-making across all health system building blocks and is essential for health system policy development and implementation, governance, and regulation (1). Health information is becoming increasingly important for measuring and improving the quality and coverage of health services, and is considered fundamental to the efficient delivery of high-quality health care (4,5). Data delivered through the health management information system comes from service delivery and administrative records kept as a part of routine transactions at health facilities and management offices (1,5).

For information to be used effectively, it must be available, accessible, of high quality, have knowledge of its applications, and be user-friendly (6). Implementation of health information is the backbone for planning and management of health services at district levels, as it can play an important role in effective and efficient health service delivery, decision making, and the improvement of the program (7). Poor health information utilization indicates inefficient and ineffective resource utilization, especially in developing countries (8).

Significant human and financial resources are being invested in improving health information at the health facility and district level, particularly in developing countries (9). The 2015 sustainable development goals within the context of universal healthcare coverage have emphasized measurement and accountability,

which can only be achieved through a vibrant national health information system aligned to the five-point call to action in measurement at the June 2015 Washington summit (10). However, the health information systems are unnecessarily fragmented and not harmonized during data management at health facilities, even though the ministries of health of different countries have formulated different policies (11).

A major issue facing Africa is its inability to quantify and analyze the situation it faces with credible data and to use the information in planning and managing service delivery (11). The poor performance is caused by an inability to implement health system improvement policies and strategies as a result of deteriorating socio-economic situations, made worse by inadequate information systems for evidence-based management of the health system (12).

According to studies conducted across Africa, the effective use of health system information was only 48.1%, indicating poor planning and performance of health outcomes, as well as insufficient budget allocation (13). According to the World Health Organization's (WHO) global report on health data systems and capacity, at least 50% of the world's countries must have a regular system to monitor the availability, quality, and effectiveness of health information(14).

The Ethiopian Federal Ministry of Health emphasized HMIS as a key to the successful implementation of the Health Sector Transformation Plan (HSTP) and achieving the Sustainable Development Goals (SDGs) (8). Considering this initiative, the Ethiopian Health Sector Strategic Plan underlines that routine data generated at district health facilities should be considered the entrance to utilizing health information as a primary source of information for continuous monitoring of health services in the country, and that data should be utilized at the place where it was generated (4).

Studies conducted across Ethiopia revealed suboptimal health information utilization by health professionals (4,8,9,15,16). The proportion of health information use ranges from 32.9% in Jimma Zone (5) to 57.8% in Amhara Region (8). The proportion of good health information utilization was 51.3% and 42.1% among primary healthcare units and health posts, respectively (4,5,8). Out of 84.3% of the data collected daily, only 22.5% were utilized, changing the data into information at the district and facility level and using it for immediate decision making (8,9).

Age, lack of user involvement, inadequate knowledge of how to use health information systems, understaffing, and a lack of refresher training are all factors that influence health information system

utilization(17,18). Data requirements are frequently chosen without taking into account the technical skills of the health workers collecting the data or the available diagnostic equipment in peripheral health facilities (19–21). Data quality, on the other hand, is lacking due to a lack of motivation among health-care workers and a lack of feedback for health-care supervisors and peripheral health workers on data reported to the higher level (2).

Different studies conducted at the health facility level in Ethiopia revealed suboptimal health information utilization practices (5,15,22,23), but the studies didn't consider different working units within these facilities where health information services are actually practiced. Even though improving healthcare data quality and utilization at facility levels has become a primary agenda (currently, the information revolution is one of the transformation agendas at the primary level for the Ethiopian government), the magnitude of optimal utilization of health information among health professionals is unclear. This study was designed to determine the level of health information use and associated factors among healthcare professionals in health facilities in Iluababor Zone, Southwest Ethiopia. The study can serve as a baseline to improve the implementation and utilization of health information in health facilities and conduct further studies.

METHODS

Study design and setting

An institution-based cross-sectional study was conducted among healthcare professionals selected from 40 public health centers in the Iluababor zone, southwest Ethiopia, from June to August 2021. The Iluababor zone is one of the Oromia region's 20 zones. It is located 600 kilometers southwest of Addis Ababa, the capital city of Ethiopia. There are 40 functional health centers and 14 woreda health offices, which offer outpatient services, laboratory services, pharmacy services, maternal and child health services (family planning, antenatal care, delivery care, postnatal care, safe abortion, and immunization services), and inpatient services. The Woreda health offices perform managerial tasks such as supporting and supervising health centres and ensuring timely service report delivery. In the Ethiopian context, Woreda is a local administration containing at least 60,000 people, and it is then divided into kebele (the lowest administrative level), which contains about 5000 people.

Study participants

The study included health workers who were collecting health data in order to utilize the information for the improvement of health status and actively interacting with patients in their daily activities, which includes health officers, nurses, midwives, laboratory technologists, and pharmacists in health centers found in the Iluababor zone. The study population consisted of health workers who were in charge of 15 service delivery points at the health center level. Health workers who were on annual leave during the study period were excluded.

Sample size and sampling techniques

The sample size was calculated using the single population proportion formula, n = (za/2)2p(1-p)/d2, with the following assumptions: 38.4% proportion of good health information utilisation (p) at East Wollega (24), with a 95% level of confidence, a 5% margin of error, and a 10% non-response rate. Finally, a sample size of 397 was obtained. Forty (40) health centers found in the Iluababor zone were included in the study. Fifteen participants from each service delivery point of health centers that were intended to use the HMIS were considered, which included triage, outpatient departments, emergencies, laboratory services, pharmacies, family planning, antenatal care, delivery care, postnatal care, EPI, under-five-year OPD, inpatient units, the ART clinic, the TBL clinic, and youth-friendly services. One health worker from each of the fifteen service delivery points was selected by a simple random sampling technique from the health centres included in the study by using the employee work attendance register to prepare the sampling frame.

Data collection tools

A pretested, self-administered questionnaire and an observation checklist were used to collect data. Socio-demographic descriptions, knowledge and practice of data management and use, the purpose of information use, and factors affecting health information use were major questionnaire contents (see Supplemental file 1). The questionnaire used in this study was compiled after an extensive review of related literature to ensure content validity (1,3–5,9). Questionnaires were distributed to each respondent

and collected after completion, and an observation checklist was used to collect data related to records like LQAS. Four data collectors (nurses) and one supervisor (a public health professional) participated in data collection. Training the data collectors and supervisors, providing supportive supervision, and making study participants clear on the study objectives were activities performed to ensure data quality. Besides, the questionnaire was pretested on 20 healthcare professionals outside the study area, at Bedele Health Center. Necessary adjustments were made to ensure the validity and reliability of the tool prior to commencing the actual data collection. The internal consistency (reliability) of the tool was measured by the Cronbach Alpha coefficient, which resulted in an internal consistency coefficient of 0.76.

Data collection procedures

In this study, utilisation of health information was assessed in terms of using information for decision-making in management and clinical services by using six item questions adapted and modified from WHO guidelines and previous articles (1,9,24). These were: (1) using information for decision-making to take action; (2) providing and accepting feedback from respective supervisors; (3) monitoring day-to-day health service activities using report formats; (4) presence of key indicators with charts or using HMIS materials (differ across service units); (5) presentation of achievements of targets at the last health centre and woreda team minutes for departmental performance evaluation; and (6) data quality check using a Lots Quality Assurance Score (LQAS) sample. All these components of the assessment tool have Likert scale measures, ranging from "strongly disagree" (1 point) to "strongly agree" (5 points). Health workers' mean scores were used to decide the health professionals' level of health information. Accordingly, healthcare professionals were considered to have good utilisation of health information when they scored above the mean value; otherwise, they were considered to have poor or limited utilisation of health information (4,5,15,24).

Data management and analysis

The data was entered into Epi-data version 3.1 and exported to SPSS version 20 for further analysis. All questionnaires were checked for completeness after completion by the study participants. Descriptive statistics, including frequencies and proportions, were computed. Descriptive statistics, including

frequencies and proportions, were computed. To identify the associated factors, variables with a p-value of less than 0.25 in the bivariable analysis were entered into the multivariable logistic regression analysis for further analysis. Finally, to demonstrate the strength of the associations, an adjusted odds ratio (AOR) with 95% confidence intervals was calculated. Then, using multivariable logistic regression analysis at a p-value less than 0.05, variables significantly associated with the use of health information were identified. The model's fitness was checked by the Hosmer and Lemeshow goodness-of-fit test. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting checklist was used to report the summary of the manuscript.

Patient and Public Involvement

Patients and/or the public were not involved in the design, conduct, reporting or dissemination plans of this research.

RESULTS

Socio-demographic characteristics of health workers in Iluababor zone

A total of 392 healthcare professionals completed questionnaires, with a response rate of 98%; only 5 questionnaires were missed. The mean (standard deviation) age of the respondents was 28.84+6. Their ages ranged from 22 to 53. The majority (62.2%) of the health care professionals were male. One hundred twenty (30.6%) were nurses, 27.3% were health officers, 16.8% were midwife nurses, 16.3% were laboratory professionals, and pharmacists made up 8.9%. More than half (51.3%) of the health workers had served for more than 10 years. The majority (76.8%) of the health workers were married, and the majority (84.1%) of them earned more than 2800 ETB per month (refer to Table 1).

Table 1: Socio-demographic characteristics of health workers at units in Health centers in Iluababor Zone, southwest, 2021.

Variable	Categories	Frequency	Percent (%)
Age	*Below 30 years*	250	63.8
	Above 30 years	142	36.2
Sex	*Male*	244	62.2
	Female	148	37.8
Marital status	*Never married*	91	76.8
	Married	301	23.2
Monthly salary	*2001-2400*	1	0.4
	2401-2800	72	18.4
	>2800	319	81.41
Professional	*Health officer*	107	27.3
category	*Nurse*	120	30.6
	Midwife	66	16.8
	Laboratory	64	16.3
	Pharmacist	35	8.9
Service year	*Below 5 years*	85	21.7
	5-10 years	106	27
	Above 10 years	201	51.3
Level of education	*Diploma*	281	71.7
	Bachelor	103	26.3
	Masters	8	2.0

Institutional characteristics of health centers in Iluababor zone

The majority (93.9%) of health workers in health centres were supervised once, and only 3.3% of them were supervised twice in the last six months. The majority (88%) of the service units reported health

service activities on time. One hundred forty-nine (38%) of the service delivery units didn't have standard HMIS materials. Regarding training, the majority (60.7%) of the respondents had received training on data analysis and management, as indicated in Table 2.

Table 2. Organizational characteristics of health centers in Iluababor zone, southwest Ethiopia, 2021

Variables	Category	Frequency	Percent
Supportive supervision in the last 6months	*Once*	368	93.9
	Twice	11	2.8
	Above two	13	3.3
Health workers received training	*Yes*	238	60.7
	No	154	39.3
Change data to information	*Yes*	189	48.2
	No	203	51.8
Availability of standard HMIS materials	*Yes*	243	62.0
	No	149	38.0
Reporting schedule	*Timely*	345	88.0
	Not timely	47	12.0
Completeness of report formats	*Yes*	242	61.7
	No	150	38.3
Using catchment map	Yes	167	42.6
	No	225	57.4
Availability of documentation	Yes	277	70.6
	No	85	29.4

Health information use among healthcare professionals in Iluababor zone

Most (69.1%) of the respondents did not receive regular feedback from the next higher health authority. On the other hand, 46.7% of the respondents indicated that they faced a lack of key indicators in charts and tables during the utilisation of health information, and during data collection, 39.5% of them had no tools. In 38% of the service delivery units, however, reports were incomplete. Only 23.7% of health professionals use report formats to monitor day-to-day health service activities, and 38.3% do not perform the lot quality assurance score (LQAS) (refer Table 3).

In this study, 258 (65.8%) of the healthcare professionals across different service delivery units in health centres in the study area used health information (95% CI: 61%–71%) while 34.2% did not (Figure 1).

Table 3. Utilization of health information use among healthcare professionals in health centers of Iluababor zone, southwest Ethiopia, 2021

Variables	Categories	Frequency	Percent
Using information for decision making to take action	*Yes*	298	76.0
	No	94	24.0
Provision and acceptance of feedback from respective supervisors	*Yes*	271	69.1
	No	121	30.9
Monitoring day to day health service activities using report formats	*Yes*	93	23.7
	No	299	76.3
Presence of key indicators with charts or using HMIS materials	*Yes*	209	53.3
	No	183	46.7
Presentation of achievements of targets at the last health center minutes for performance evaluation	*Yes*	231	58.9
	No	161	41.1
Data quality check using Lots Quality Assurance Score (LQAS	*Yes*	150	38.3
	No	242	61.7
Health information	*Good*	258	65.8
	Poor	134	34.2

The majority of service delivery units in the studied health centres made good use of health information. The least was among the youth-friendly service unit, which was 4.6% (refer to Table 4).

Table 4. Utilization of health information by service delivery units in health centers in Iluababor zone, southwest Ethiopia, 2021 (result of observation checklist)

Service delivery point	Total participated n (%)	Health information Good, n (%)	Poor, n (%)
EPI	24(12.17)	16(6.2)	8(5.97)
Antenatal care	27(14.04)	17(6.58)	10(7.46)
Admission	26(13.29)	17(6.58)	9(6.71)
ART/VCT clinic	26(13.29)	17(6.58)	9(6.71)
Delivery	27(13.68)	18(6.97)	9(6.71)
Emergency	27(13.68)	18(6.97)	9(6.71)
Family planning	27(13.68)	18(6.97)	9(6.71)
Laboratory	27(13.68)	17(6.58)	10(7.46)
TB-leprosy clinic	27(13.68)	18(6.97)	9(6.71)
Triage	27(13.68)	18(6.97)	9(6.71)
Out patient department	27(13.68)	18(6.97)	9(6.71)
Pharmacy	27(13.68)	18(6.97)	9(6.71)
Postnatal care	27(13.68)	18(6.97)	9(6.71)
Under five OPD	27(13.68)	18(6.97)	9(6.71)
Youth friendly service	19(9.87)	12(4.65)	7(5.22)
Total	392(100)	258(65.8)	134(34.2)

Factors associated with utilization of health information

In the multivariable logistic regression analysis, the completeness of report format, training on health information, use of standard HMIS guidelines, and age were found to be significantly associated with health information utilisation among health service units. Accordingly, the odds of using health information among health workers who had training were eight times higher compared with those without training (AOR = 8.31; 95% CI: 4.34–14.90). Also, the odds of using health information among health workers in units having standard HMIS guidelines were eight times higher than their counterparts (AOR = 8.10; 95%

CI: 3.51–16.58). In addition, the odds of health workers in units with complete service reports were ten times higher than those with incomplete report formats (AOR = 10.24; 95% CI: 5.0–15.14). Furthermore, health workers whose age was above 30 years were 60% more likely to use health information than those below 30 years (AOR = 0.4; 95% CI: 0.2–0.77) (refer toTable 5).

Table 5. Factors associated with health information utilization at service units of health centers in Iluababor zone, southwest Ethiopia, 2021.

Variable		Health information use		COR (95% CI)	AOR (95% CI)
		Good (%)	*Poor (%)*		
Age	<=30	157(62.8)	93(37.2)	0.68(.44,1.07)	0.4(0.2,0.77)*
	>30	101(71.1)	41(28.9)	1	1
Received feedback	Yes	145(63)	85(37)	0.74(0.48,1.14)	0.66(0.34,1.26)
	No	113(69.8)	49(30.2)	1	1
Number of supervision	Above 2	11(84.6)	2(15.4)	2.9(0.65,13.60)	0.5 (0.03,8.61)
	Twice	8(72.7)	3(27.3)	1.44(.38,5.52]	0.41(.04,4.07)
	Once	239(64.9)	130(35.1)	1	1
Completeness of report format	Yes	207(85.5)	35(14.5)	11.5(7.02,18.8)	10.24(5.0,15.14)*
	No	51(34)	99(66)	1	1
Training	Yes	197(82.8)	41(17.2)	7.3(4.6,11.68)	8.3(4.34,14.90)*
	No	61(39.6)	93(60.4)	1	1
Using standard HMIS tools	Yes	196(80.7)	47(19.3)	5.8(3.71,9.23)	8.10(3.51-16.58)*
	No	62(14.6)	87(58.4)	1	1
Using catchment map	Yes	104(62.3)	63(37.7)	0.7(0.50,1.16)	0.82(0.39,1.69)
	No	154(68.4)	71(31.6)	1	1
Local decision	Yes	111(58.7)	78(41.3)	0.54(0.36,0.83)	1.68(0.83,3.42)
	No	147(72.4)	56(27.6)	1	1
Availability of documentation	Yes	209(68.2)	68(31.9)	2.25(0.96,2.56)	0.57(0.27,1.21)
	No	49(57.6)	36(42.4)	1	1

* significant at p-value < 0.05 CI: confidence interval COR: crude odds ratio AOR: adjusted odds ratio

DISCUSSION

The current study was aimed at assessing the magnitude and identifying factors associated with health information utilisation among healthcare professionals at health centers. According to our findings, 65.8% of the healthcare professionals in health centres demonstrated health information utilization. This finding is in line with the results of studies conducted at Hadya (69.3%) (16) and in East Wollega (66.0%) (24). This might be due to the similarity between population structure and the health information generating system at health centers. However, the results of this study were higher than those of previous studies in Kenya, 48.1%(13), in North Gonder, 38.4% (8), in East Gojam, 45.81% (15), and in Jimma at 32.9% (5), and another district based study in Ethiopia (25). The variation might be due to study design, sample size, the emphasis given to training on HMIS to build the capacity of staff on health information utilisation at the study area, and the time difference among the studies. Furthermore, the government has recently placed a special emphasis on the use of information for evidence-based decision making and the improvement of healthcare professionals' information-use culture (9).

Identifying factors that affect the utilisation of health information is very important to improving healthcare services through the utilisation of health information for decision-making. In this study, healthcare professionals using standard HMIS materials like registers and tall sheets were eight times more likely to contribute to the utilisation of health information than those not using standard materials from the HMIS. This finding is supported by a study conducted in North Gonder (8), which showed that using HMIS materials improves utilisation of health information. The possible explanation for this is that if the standard HMIS materials are available at health facilities, there is a greater likelihood of utilisation of health information, and without these materials, it is even more difficult to generate health information.

Likewise, units with complete report formats were ten times more likely to increase utilisation of health information than those with incomplete report formats. This study is in line with a study conducted in Hadya Zone (16) that indicated the association and contribution of completing a format report to health information management and utilization. The possible explanation for this is that complete reports will lead to health information and aid in decision-making or the utilisation of information.

Health workers who had taken HMIS training were eight times more likely to utilise health information than those who were not trained in HMIS. These findings were supported by studies conducted in East Gojam (15) and North Gondar (9). This is due to the fact that training improves data generation, compliance, and decision-making, and the usage and interpretation of data captured from training would enhance the utilisation of health information.

Health workers under the age of 30 were approximately 60% less likely to use health information than those over the age of 30. This study contradicts studies in Harar (26) and the USA (27). The variation could be explained by the fact that health workers under 30 years old are typically beginners who lack adequate skills, training, supportive supervision, and feedback related to the use of health information (25), so that new health professionals are unfocused on health information rather than clinical services and do not actively participate in generating data and information using standard HMIS materials.

As a result, providing continuous in-service training and updating staff on health information at health centres and departments of health centers, as well as continuously supporting HMIS materials and testing with LQAS tools, are essential to ensuring all indicators are completely filled in in the report format for health information utilisation for decision-making. Besides, improving the completeness of the report format, training of new staff on health information, and the use of HMIS standards for materials are crucial to solving the gap.

This study provided important results regarding health information utilisation and the contributing factors since utilisation of health information is vital for operational, tactical, and strategic decision making. Health information utilisation is important at all levels of the health system and is generated through effective data processing, analysis, and interpretation.

Although the purpose of the study was to examine how much health information was used and the characteristics that were related to it, there were some limitations. Since the use of health information was based on self-reported data, it could be subjected to overestimation. This study is limited to health workers at service delivery points in health facilities. Further studies supported by qualitative methods, including different stakeholders from health offices, are recommended.

CONCLUSION

This study concluded that more than three-fifths of healthcare professionals had good health information utilization which is low, compared to the national cut-off point. Age of health workers, completeness of report format, use of standard HMIS tools, and training on HMIS data use were the identified factors associated with health information utilisation at the health center's service delivery units. Because the study was carried out in all health centres with a random sample of healthcare professionals, the results can be considered representative of the health professionals in Iluababor Zone, southwest Ethiopia. Improving users' data management inputs, providing training for all health workers, and availing and using standard HMIS tools are important to improving health information use in health centers. An attempt to provide training, supportive supervision, and ensure report completeness may aid in improving and achieving the expected level of health information utilisation for decision-making.

Contributors

DN and AZ were involved in the conception of the study. DN, GH, AM and AZ were involved in the methodological design, data acquisition, analysis and interpretation. AZ wrote the first and revised drafts of the manuscript. All authors were involved in the final approval of the version to be published and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. AZ is responsible for the overall content as the guarantor.

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Competing interests: None declared.

Patient consent for publication: Not applicable.

Ethics approval

This study involves human participants and was approved by the ethical review committee of the College of Health Science, Mettu University (approval number RCS/019/2019) and presented to Iluababor Zone

Health Department and respective distrcit health offices. An official letter was obtained from district health office and presented to the respective health facilities. The purpose and importance of the study were explained to the study participants, informing them of the right to withdraw at any time during the study period. Health workers were given the questionnaire after written consent was obtained and the privacy of participants and confidentiality of information was maintained at all levels. Any personal identifier were not included in the questionnaire. The participants gave informed consent to participate in the study before taking part.

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Data availability statement

The data sets used or analysed in this study are available from the corresponding author upon reasonable request.

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Figure Legends

Figure 1. Utilization of health information among healthcare professionals in Iluababor zone, Southwest Ethiopia, 2021

Supplemental file 1. Questionnaire

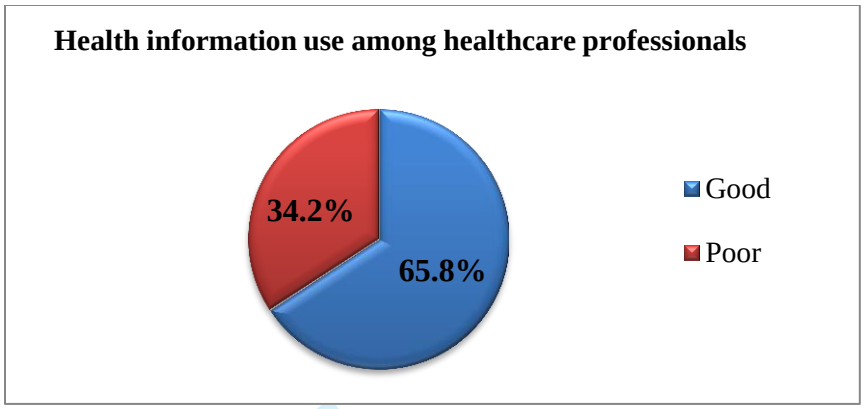

Figure 1. Utilization of health information among healthcare professionals in Iluababor zone, Southwest Ethiopia, 2021

Questionnaire prepared to assess health information utilization and associated factors

Part one: Socio demographic characteristics
1. Age (in completed years) _____
2. Sex ☐ Male ☐ Female
3. Marital status ☐ Never married ☐ Married
4. Level of education ☐ Diploma ☐ BSc ☐ Master ☐ Other, Specify___
5. Profession ☐ Health officer ☐ Nurse ☐ Midwife ☐ Pharmacy ☐ Laboratory ☐ Other, please specify_____
6. Total service year (in years) _____
7. Monthly salary (in ETB)_____
Part two: Organizational Factors
8. Do you take on job training on utilization of health information in your institution? ☐ Yes ☐ No
9. Is there daily recording system for the activities? ☐ Yes ☐ No
10. Do you have standardized set of indicators in your working office?
11. In your institution, have you displayed health indicator targets? ☐ Yes ☐ No
12. Have you discuss the monthly performance progress using the standard indicators? ☐ Yes ☐ No
13. Is the tool for data collection correctly and completely filled by the health professionals always? (check the answer by observation) ☐ Yes ☐ No
14. Have you change the collected data into information in your department? (Check by observation) ☐ Yes ☐ No

15. Have you reported the collected data in the last three months? (check the answer by observation) ☐ Yes ☐ No

16. Your facility has data quality check system? ☐ Yes ☐ No

17. Does your organization have regular meeting to improve health information utilization? ☐ Yes ☐ No

18. Have you receive regular feedback on your report? ☐ Yes ☐ No

Part three : Health information use

Please indicate your level of agreement on the following statements regarding the utilization of health information. The statements are expressed using the Likert scale; 1-Strongly Disagree, 2 Disagree, 3-Neither Agree or Disagree, 4-Agree 5-Strongly agree.

Code	Health information used for :	Response				
		1	2	3	4	5
U01	Decision making to take action					
U02	Getting feedback from respective supervisors					
U03	Monitoring day to day health service activities					
U04	Presence of key indicators with charts or using HMIS materials					
U05	Checking data quality (using Lots Quality Assurance Score)(LQAS)					
U06	Presentation of achievements of targets at the last health center and woreda team minutes for department performance evaluation					

Observation Checklist

Name of Health Facility :_____

Woreda(District): _____

Service Unit observed _____

Name of observer: _____

Date :____/_____/_____

Code	*Items to be checked*	*Verified*	
		Yes	***No***
Ch01	Presence of health facility HIS* targets displayed		
Ch02 **Ch03**	Presence of health facility indicator performance charts, graphs and table displayed		
Ch04	Presence of staff meeting minutes reflecting reports, data and feedback from health facility or district discussed		
Ch05	Presence of HIS training manual and guide		
Ch06	Presence of HIS supervisory checklist		
Ch07	Presence of HIS supervisory report		
Ch08	Presence of data quality assurance checklist		
Ch09	Data collection correctly and completely filled by the health professionals		
Ch10	Change collected data into information and reported in the last three months		

HIS: Health information system*

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	7
		(*c*) Explain how missing data were addressed	7
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	7
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	8
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
Outcome data	15*	Report numbers of outcome events or summary measures	11
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	12

		(*b*) Report category boundaries when continuous variables were categorized	9
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarise key results with reference to study objectives	14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16
Generalisability	21	Discuss the generalisability (external validity) of the study results	16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.