Routine Health Information Use for Decision-making and Associated Factors among Managers Working at Public Hospitals in North Shewa Zone of Oromia Regional State, Ethiopia: A Mixed-Method Study

Gemechu Tulu

Kuyu General Hospital, Ethiopia

Takele Gezahegn Demie (✉ takele.gez44@gmail.com)

Debre Berhan University   https://orcid.org/0000-0002-6296-7706

Tesfalem Teshome

SPHMMC: St Paul's Hospital Millennium Medical College

Research

Abstract

Background: Routine health information systems (RHIS) are vital for the acquisition of data for health sector planning, monitoring, and evaluation, patient management, health education, resource allocation, disease prioritization, and decision-making. Routine health information use for decision-making is low in Ethiopia. Thus, the study aimed to assess level of routine health information use and its associated factors among managers working at public hospitals in North Shewa, Ethiopia.

Methods: A facility-based cross-sectional study design with both quantitative and qualitative data collection methods was conducted from May to June 2020. A total of 102 randomly selected managers working in public hospitals in North Shewa were included in the quantitative study while six in-depth interviews were performed for the qualitative method. Quantitative data were collected using a structured self-administered questionnaire and interview guide by trained data collectors, cleaned, coded, and entered into Epi-info version 7.1 software and transferred into SPSS version 23 software for Window for further statistical analysis. Both bivariable and multivariable logistic regression analyses were performed. In the multiple logistic regression analysis, a less than 0.05 P-value was considered statistically significant. The odds ratio along with a 95% confidence interval (CI) were estimated to measure the strength of the association. Thematic analysis was done for key informant interview data.

Result: In this study, the level of routine health information use for decision-making was 71.6% (95% CI: 61.8%, 79.4%). According to the multivariable logistic regression analysis, training on health information system (AOR = 0.28, 95% CI: 0.08-0.98) and supportive supervision (AOR = 0.27, 95% CI: 0.09-0.78) were found significantly associated with the use of routine health information for decision-making. Moreover, the lack of staff motivation and computer and data analysis skills were the major reasons for not using routine health information.

Conclusions: Three-fourth of the managers working at public hospitals used routine health information for decision-making. Training on health information system and supportive supervision were factors associated with the use of routine health information. Therefore, training of managers and the provision of supportive supervision were highly recommended to improve the use of routine health information managers for decision-making at public health institutions.

Background

A health information system (HIS) is a system designed for the collection, processing, use, and dissemination of health-related data to improve health care outcomes (1). It is essential for health system policy development and implementation, governance and regulation, health research, human resources development, service delivery, and financing (2). Routine Health Information System (RHIS) is the backbone for planning and management of the health service activities, the day-to-day patient management, health education, resource allocation, disease prioritization, and decision-making (3). A

properly functioning RHIS enables the policymakers, managers, and service providers to make decisions based on evidence, ultimately leading to sustainable health outcomes in the community they serve (4).

Globally, significant human and financial resources have been invested to improve routine health information systems for planning, reporting, community health mobilization, and observing disease trends (5). Evidence-based decision-making through health information system use has become the top priority on the agenda of the government of Ethiopia and its development partners. There are minimal efforts by health workers and managers to demand and use the available routine health information for service delivery, planning, and decision-making (6).

However, most of the health workers in developing countries relate information systems with filling endless registers by names and addresses of patients, compiling information on disease every week or month, and sending reports to the next level without adequate use and feedback (7). As a result, many health systems fail to fully link evidence to decisions and suffer from a reduced ability to respond to priority health needs at all levels of the health care system (3).

Routine health information systems in developing countries do not provide the necessary information which supports decision-making. Some of the reasons are poor quality of data, weak data analysis, lack of information culture, lack of trained personnel, and Health Information System (HIS) activities seen as a burden due to high workloads especially at the health facility level (8). The use of information for evidence-based decision making is still very weak in most low- and middle-income countries (LMICs), particularly for data produced by health facilities. Findings from Africa countries indicated that routine health information use among managers remains low; 39.9% in Nigeria (9), 55.6% in Kenya (10), 42% in Tanzania (11), 59% in Uganda (12), and 65% in South Africa (13).

The use of health information in Ethiopia for policy and strategy formulation, planning, and decision making is not widely practiced. Data quality and information use remain weak, particularly at the health facilities level. Health workers spend 40% or more of their time filling in Health Management Information System (HMIS) forms but may make little or no use of information for decision- making (14). A very recent study conducted in North Gondar on the use of routine health information among health workers working at public health institutions showed that the use of health information was 78.5 %. However, the information used in Ethiopia ranges from 32.9–78.5% (15), (16). Assessment done in Jimma Zone revealed that out of 84.3% data collected daily only 22.5% of them used, only 17.7% changed their data into information at district and facility level, and used it for immediate decision making (17).

A study showed that routine health information use can be affected by the organizational, technical, and behavioral characteristics of the managers (18). Among the factors reported, training (19), computer skill (18), data analysis skill (20), computer access, availability of HMIS guidelines and formats (21), supportive supervision with effective feedbacks (8), (22), (23), data infrastructure in respect to the information and communications technology application (24), confidence level (13), and competency of managers (22) are commonly associated with routine health information use.

Owing to the observed gap in the health sector in Ethiopia, information use has been given substantial prominence in the Health Sector Transformation Plan (HSTP) as part of the information revolution which is one of the four transformation agendas. The information revolution is not only about changing the techniques of data and information management; it is also about bringing fundamental cultural and attitudinal change regarding the perceived value and practical use of information (6). Therefore, this study pursued to assess the magnitude of routine health information use for decision-making and its associated factors among managers working in Public Hospitals in North Shewa of Oromia Regional State, Ethiopia. The finding will help to change policy and improve the programs' effectiveness, to allocate resources for interventions of health information use, and effectively implement different health sector programs and strategies.

Methods

Study design and setting

A facility-based cross-sectional study with both quantitative and qualitative data collection methods was conducted at public hospitals of North Shewa Zone from May to June 2020. Fitche, the capital of the zone, is located 112 kilometers far from Addis Ababa (the capital of Ethiopia) to North-west at 9.5^0 N and 38.67^0 E. Based on the 2007 census conducted by the Central Statistics Agency of Ethiopia (CSA), the zone has a total population of 1,445,993, of whom 724,894 were men; with an area of 10,322.48 square kilometers (25). However, according to the population projection of 2020, the current population of the zone was estimated to be 2.14 million. In the North Shewa zone, there are four hospitals namely Fitche, Kuyu, Dera Gindo Meskel, and Muka Turi hospital providing health care services for the populations. The managerial position within each hospital includes Chief Executive Officer, Process Owner Heads, Department Heads, and Case Team (Unit) Heads. There were 4 Chief Executive Officer, 12 sub-process heads, 16 department heads, and 94-unit heads in the four hospitals.

Study participants, sample size, and sampling procedure

All health care workers (HCWs) working in all hospitals of the North Shewa Zone who were managing hospitals, heading sub-process, departments, and units were the source population. Randomly selected HCWs who had been working as managers of the hospitals, sub-process and department/unit heads were the study population. Health care workers who had been working in different managerial positions in the hospitals for at least six months preceding the survey period were included in the study. However, health workers who were absent from their units/departments, who did not volunteer to participate, and who were seriously ill during the data collection period were excluded from the study.

The sample size for the quantitative method was calculated using the single population proportion formula, assuming 78.5% prevalence of use of health information system (p) in North Gondar, Western Ethiopia (16), a 95% confidence level, a 5% of margin of error, and a 10% on-response rate. Finally, a minimum sample of 105 was obtained. Then, the sample was allocated proportionally to each Hospital.

Simple random sampling (SRS) technique was used to select the samples from each Hospital using lottery method based on the list that was available in the human resource department of each Hospital. Twenty-eight managers were selected from each of the Kuyu and Fitche Hospital, 25 from Dera Gindo Meskel Hopsital, and 24 from Muka Turi Hospital.

For the qualitative method, six participants were selected using purposive sampling technique [four are Chief Executive Officers (CEO) and two of them are Health Information Officers (HIT)] for key informant interview (KII).

Study variables

Routine health information use for decision-making is the outcome variable. The independent variables consists of socio-demographic variables including age, sex, monthly income, work experience, professional category, and position in hospital; organizational variables including health management information system equipment and materials, and supportive supervision; technical variables including computer skills, training on health information use, and data analysis skills; and behavioral variables including competency, confidence level, and motivation.

Operational definitions

Routine health information

Data generated from healthcare facilities at regular intervals (26).

Routine health information use

defined as the use of health information for five or more out of asked ten purposes; service improvement, patient treatment, staff performance, planning department evaluation, monitoring key performance indicator, prediction of outbreaks, resource allocation development of policy and advocacy (27).

Decision-making

It is the process of identifying and choosing alternatives based on the values, preferences, and beliefs of the decision-maker (28).

Managers: in this study were defined as hospital employees who are responsible for the work performance of other hospital staff and have formal authority to use the hospital's resources.

Data collection methods, tools, and procedures

Questionnaire was adapted from previous study and the performance of routine information system management (PRISM) framework in which behavior, technical and organizational factors were the major determinants of the utilization of routine health information systems (26). The questionnaire contains; socio-demographic part (6 items); level of health information use for decision-making part (11 items); technical factors part (10 questions); organizational factors part (12 questions); and behavioral factors

part (19 questions). Quantitative data were collected using the pretested, structured, and self-administered questionnaire. Two nurses who hold a Bachelor's of Science in Nursing and one Master of Public Health (MPH) were recruited as data collectors and supervisor respectively for the data collection. The questionnaire was distributed by data collectors to managers after debriefing the objective of the study and getting informed consent.

Qualitative data was collected using KII question guide. The interviews were recorded for an average of 20 minutes using a tape recorder and note was taken by a recorder and moderated by a facilitator. The principal investigator facilitated the interview process.

Data quality control

Both the questionnaire and KII question guide were translated to the local language (Afan Oromo) and back-translated to English by the language expert to ensure consistency. The questionnaire was pre-tested on 5 % of the sample among managers working in Chancho primary Hospital which is found in the Oromia Special Zone Surrounding Finfine two weeks before the actual data collection. The questionnaire was checked for its clarity, understandability, and simplicity. The questionnaires were also reviewed and reformatted based on the inputs and comments of the pre-test results. The training was given for the data collectors and supervisor for two days on the objective of the study, how to ensure data quality, and about data collection process. The data were checked for completeness and consistency by the supervisors on daily basis. The principal investigator and supervisor supervied the data collection processes.

Data processing and analysis

Data were cleaned, coded, and entered into Epi Info version 7.1 and exported to the Statistical Package for Social Sciences (SPSS) version 23 for further analysis. Descriptive statistics was used to present the frequencies, proportion and summary statistics. Bi-variale analysis was carried out to see the association of each independent variable with the routine health information use. Those variables with p-value of less than 0.25 were inclued in multivariable logistic regression analysis. Multivariable logistic regression analysis was carried out to control possible confounders and identify factors independently associated with routine health information use. The model fitness was checked by the Hosmer Lemeshow test and it was fit (P-value = 0.747). Both Crude Odds (COR) and Adjusted Odds Ratios (AOR) with 95% confidence interval (CI) was used to identify the strength of association with routine health information use. Finally, a p-value of less than 0.05 in the multivariable logistic regression analysis was used to identify variables significantly associated with the use of routine health information for decision-making. Qualitative data collected during field visits, were organizing, coded and analyzed as per themes emerged using Open Code software version 4.03. Finally, thematic analysis was performed and descriptive summaries were made based on what participants described.

Ethical considerations

Prior to data collection ethical clearance (protocol number: pm 75/517) was obtained from the Institutional Review Board (IRB) of St. Paul's Hospital Millennium Medical College (SPHMMC). Official

letters of support was sent to the North Shewa Health Department and hospitals, and data was collected after getting permission from the concerned offices and hospitals. Then, informed written consent was obtained from each study participants, after the necessary explanation about the purpose and benefits of the study and also the right on the decision of participating in the study. Confidentiality and anonymity were maintained during interview and use of data.

Results

Socio-demographic characteristics of the respondents

Out of 105 managers planned to participate, 102 managers of different levels working in four public hospitals participated resulting in a response rate of 97.1 %. The mean age of the study participants was 28.5 (± 3.66 SD) years with a minimum of 21 and a maximum of 44 years old. Nearly, two-third (65.7%) of the managers were 20–29 age category and nearly two-third (63.7%) were men. Besides, the managers had a median was salary 7071.0 Ethiopian Birr (ETB) with the interquartile range of 2131. The managers have a mean work experience of 4.1 years (± 2.62 SD) in their current respective hospitals; which ranges from 1 to 11 years. Seventy-four (72.5%) managers were unit leaders by their managerial position whereas 72 (70.6%) of them were paramedical professionally (Table 1).

Table 1

Socio-demographic characteristics of managers working in public hospitals in North Shewa Zone, Oromia Regional State, Ethiopia, 2020 (n = 102)

Variables	Responses	Frequency (Percent)
Age	20−29	67 (65.7)
	30−39	33 (32.4)
	≥ 40	2 (2)
Sex	Female	37 (36.3)
	Male	65 (63.7)
Monthly income (in ETB) [a]	3201−5250	6 (5.9)
	5251−7800	67 (65.7)
	≥ 7801	29 (28.4)
Work experience in service year	1−3	58 (56.9)
	4−6	26 (25.5)
	≥ 7	18 (9.8)
Professional category	Medical doctor	20 (19.6)
	Paramedical [b]	72 (70.6)
	Other [c]	10 (9.8)
Position in the respective hospital	Subprocess head	8 (7.8)
	Department head	20 (19.6)
	Unit leader	74 (72.5)
a- *ETB = Ethiopian Birr.*		
b- Other health care workers including Nurse, Midwifer, Laboratory technologist, Pharmacist, Radiologist, and Environmental Health Professional		
c- Accountant, Management, and Auditor		

Six key informant interviews were performed, of which four were CEO and two of them were HIT. All the participants were male, and their age ranges from 26 to 42 years old. The participants have one to three years' work experience in their current respective hospitals.

The level and purpose using of routine health information (RHI) by managers

In this study, more than two-third (71.6%, 95% CI: 61.8%-79.4%) of the managers have used RHI generated at their sub-process, departments, or case team (Fig. 1). Figure 2 shows the purpose of using routine health information by the managers. In this study, 87 (85.3% %) of the respondents used routine health data for service improvement and 83 (81.4%) for treating patients. Only 42 (41.2%) managers were used RHI for resource allocation, 25 (24.5%) for policy development, and 24 (23.5%) for advocacy. This result is supported by the findings from one of a 39 years old KII participant as stated below;

The main purpose of collecting the health information was for decision-making, … we used for human deployment, to know physician per capita, pharmacist per capita or laboratory professional per tests as compared to the standards, for resource allocation, for quality improvement. Overall, we collect data not for holding, but decision-making.

As shown in Fig. 3, respondents have also stated the problems encountered when they want to use routine health information decision-making including data incompleteness and data unavailability when they need for decision-making, each account 36 (35.3%) followed by inaccurate data (17, 16.7%).

Organizational characteristics

Only twenty-nine (28.4%) oa the participants agreed that management team performed supportive supervision as per scheduled. Only 27 (26.5%) of the managers agreed that supervisory report delivered to departments. On the Likert scale, respondents reflected the extent they agreed with organizational factors (Table 2). The finding from a KII also supports this result. A 42 years old KII participant stated that the role of senior management in the use of health information in hospitals:

My role as CEO of the hospital was to ensure the delivery of quality health information. … To facilitate the conversion of data to information, reports collected from units or departments were evaluated by performance monitoring team. …Then, feedbacks were delivered to the respective units or departments. Thirty-three

(32.3%) of a staff meeting with departments on administrative issues was not scheduled. About 23 (22.5%) managers have monthly meeting and 18 (17.6%) of them replied there is no meeting at all. It was found out that 20 (19.6%) of the respondents were accessed the internet and only 40 (39.2%) accessed a computer in the workplace or office (Fig. 4). Finding from a participant having three years of work experienced indicated inadequate equipment and supllies in the hospitals:

Equipment ans suspplies that promotes health workers to use health information are internet access, registration books, and computers. The supply was not adequate; it is limited to health informatics technicians and some department heads.

Table 2

Organizational characteristics of public hospitals in North Shewa Zone, Oromia Regional State, Ethiopia, 2020 (n = 102)

Variables	Strongly disagree	Disagree	Niether disagree nor agree	Agree	Strongly agree
Hospital has standard HIMS[a] guideline	14 13.7%)	24 23.5%)	24 23.5%)	27 26.5%)	13 (12.7%)
Standard HMIS format available all the time	8 (7.8%)	16 (15.7%)	17 (16.7%)	28 (27.5%)	33 (32.4%)
There are mechanisms for on job training	15 (14.7%)	32 (31.4%)	23 (22.5%)	25 (24.5%)	7 (6.9%)
Hospital performed training on information use	20 (19.6%)	35 (34.3%)	16 (15.7%)	21 (20.6%)	10 (9.8%)
There is schedule for HMIS supervisory visit	16 (15.7%)	36 (35.3%)	24 (23.5%)	13 (12.7%)	13 (12.7%)
Management team has performed supportive supervision	21 (20.6%)	37 (36.3%)	21 (20.6%)	14 (13.7%)	9 (8.8%)
Supervisory report delivered to departments	19 (18.7%)	28 (27.5%)	28 (27.5%)	20 (19.6%)	7 (6.9%)

a – HMIS stands for health management information system

Technical characteristics

Sixty-one (60.8%) of the respondents have not received training on how to use RHI. Only 49 (48%) of the respondents have computer skills for data analysis, and 23 (51%) were analyzed health data manually (Fig. 5). This result was supported by the findings from a 26 years old KII participant as stated below indicating the presence of skill gap:

There are gaps in the skills for using health information among our health workers. … there is a problem of understanding indicators among health workers during report preparation which was corrected by the performance monitoring team before reported to the concerned body and the feedback was delivered to the case teams or departments.

Only forty-nine (48%) respondents received on-job training, and more than two-thirds (71.4%) had no professional knowledge on data analysis. This result was also supported by the findings from a 29 years old KII participant as stated below which indicate availability of managers who lack data analysis skill;

Concerning skills and competency of our health workers/managers, there were three groups. The first group was those who have skill to analyze data. The second group was those who have skill but who did not analyze data and the third group was those who lack skill and cannot analyse data.

Competency, confidence in accomplishing HIMS activities, and motivation of managers

Based on competency assessment questions, the overall average of competence of hospital managers for RHIU tasks was 66.7% (Table 3). Based on the confidence level assessment questions, only 44 (43.1%) managers are said they are confident to accomplish HMIS activities and the overall average confidence level of the respondents was 56%. Confidence in computing trends from bar charts scored 58% whereas confidence in data accuracy scored 60%.

Table 3
Competency of managers to use routine health information at hospitals in North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102)

Competency of managers	Poor	Fair	Good	Very good
I can check data accuracy	8 (7.8%)	35 (34.3%)	46 (45.1%)	13 (12.7%)
I can calculate percentage and rates	6 (5.8%)	24 (23.5%)	49 (48%)	23(22.5%)
I can plot information by months or years	9 (8.8%)	30 (29.4%)	46 (45.1%)	17 (16.7%)
I can explain findings and their implications	5 (4.9%)	40 (39.2%)	44 (43.1%)	13 (12.7%)
I can use the information to identify gaps and set targets	4 (3.9%)	30 (29.4)	50 (49.0%)	18 (17.6%)

Forty-two (41.2%) managers described themselves as having motivation towards the use of available RHI for decision-making (Table 4). This low motivation was supported by the findings from one of a 26 years old KII participant as stated below:

"The perception of health workers and managers on information use was very poor. Access to internet, registration book, lack of training which are used for updating knowledge are hindered the health workers or managers from using health information for decision-making."

Table 4

Motivation of managers to use routine health information at hospitals of North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102)

Variables	Strongly disagree	Disagree	Niether disagree nor agree		Strongly agree
Collecting information which is not used for decision-making discourage me	34 (33.4%)	10 (9.8%)	17 (16.7%)	26 (25.5%)	15 (14.7%)
Collecting information make me feel bored me	39 (38.2%)	33 (32.4%)	11 (10.8%)	14 (13.7%)	5 (4.9%)
Collecting health information is a meaningful work for me	4 (3.9%)	10 (9.8%)	11 (10.8%)	47 (46.1%)	30 (29.4%)
Collecting information give me the feeling that data is needed for monitoring	6 (5.9%)	5 (4.9%)	21 (20.6%)	37 (36.3%)	33 (32.4%)
Collecting information give me the feeling that it is forced on me	21 (20.6%)	26 (25.5%)	16 (15.7%)	35 (34.3%)	4 (3.9%)
Collecting information is appreciated by coworkers and superiors	13 (12.7%)	16 (15.7%)	15 (14.7%)	41 (40.2%)	17 (16.7%)

Factors associated with routine health information use (RHIU)

In bi-variable logistic regression analysis, only three variables namely manager's computer skills, supportive supervision by senior managers, and training on the usage of health information system (HIS) were factors associated with RHIU at a p-value ≤ 0.25. Consequently, these variables were subjected to multivariable logistic regression analysis, and it was noted that only training on HIS and supportive supervision by senior managers were remain significantly associated with RHIU at a p-value of 0.05. In this study, the odds of using RHI were 27% times more among managers who received supportive supervision on routine health information when compared with individuals who have not received supportive supervision (AOR = 0.27, 95% CI: 0.09–0.78). Similarly, the odds of using RHI were about 28% times higher among managers who have taken training on health information system use when compared with managers who are not trained on routine health information (AOR = 0.28, 95% CI: 0.08–0.98). Socio-demographic variables, competency, motivation, computer skills, access to computer, availability of printer, and data analysis skills were not significantly associated with the use of routine health information (Table 5).

Table 5

Factors associated with RHIU [a] among managers working at the public hospitals of North Shewa Zone, Oromia Regional State, Ethiopia, 2020

Variable and response	Use of routine health information use for Decision-making (n = 102)		COR (95% CI) [b]	AOR (95% CI) [c]
	Yes	No		
Computer skills				
No	33 (32.3%)	20 (19.6%)	1	
Yes	40 (39.2%)	9 (8.8%)	0.37 (0.15–0.92) *	
Supportive supervision				
No	48 (47.1%)	25 (24.5%)	1	1
Yes	25 (24.5%)	4 (3.9%)	0.31 (0.10–0.98) *	0.28 (0.08–0.98) **
Training on HIS [d]				
No	39 (38.2%)	23 (22.5%)	1	1
Yes	34 (33.3%)	6 (5.8%)	0.30 (0.11–0.82) *	0.27 (0.09–0.78) **

* Variables that are significant at p–value ≤ 0.25; ** Variables that are significant at p–value ≤ 0.05

a– RHIU stands for routine health information use

b– COR = crude odds ratio

c– AOR = Adjusted odds ratio; CI = confidence interval

d– HMIS = health information system

Discussion

This study aimed to assess the routine health information useful for decision-making and its associated factors among managers working in public hospitals. From this finding, the magnitude of the use of routine health information for decision-making by managers was 71.6% and training and supportive supervision were the factors associated with the use of routine health information.

The magnitude of the use of routine health information in this study was slightly comparable with study findings from Gondar (16), Hadiya Zone of South Nation Nationalities and Peoples (21). It is also slightly

similar to the finding outside Ethiopia from South Africa (13). On the other hand, the finding was higher than those of studies reported from Addis Ababa (20), East Wollega Zone (29), East Gojjam (15), and East Ethiopia (23). The findings of this study also higher than the findings outside Ethiopia, from Nigeria (9) and Kenya (30). This might be due to the variation in study periods and the differences in study participants. Moreover, recently federal ministry of Ethiopia has given a special emphasis on the use of health information for evidence-based decision-making.

In this study, the odds of the use of routine health information among managers who got supportive supervision were four times more likely as compared to the managers who did not get supportive supervision from the senior management team. This finding is supported by the study conducted in the East Gojjam zone (16). When organizational systems are in place to support a culture of data-informed decision making, data producers and users are better able to understand the value of data to the health system, data tends to be of higher quality, data is communicated and shared through the health system and, as a result, it is used in decision making (3).

The finding of this study indicated that managers who trained in health information systems were 3.7 times more likely to utilized health information than those who did not train. This finding is supported by study findings from Eastern Ethiopia (23) and the World Health Organization recommendation (31). This could be because users with adequate knowledge on how to manage, process, communicate, and use health information, can incorporate the skills more easily into their daily activities. Besides, training was often used to close the gap between current performances and expected future performance, and through training, employees were acquired and improved knowledge, skills, and attitudes towards work-related tasks.

Findings from qualitative analysis also indicated competency of managers has an impact on the use of health information as it related to computer and data analysis skills. Another finding from the qualitative analysis indicated managers have low motivation on use of health information due to lack of training, data quality problem, internet problem, health worker workload, lack of computer and staff turnover.

The strength of this study was that it used a mixed-method to assess the factors associated with the use of routine health information system. Moreover, the researcher used the questionnaires which are adapted from the Performance of Routine Information System Management (PRISM) assessment tool, which were validated tools. This study could have the following limitation; the key informant interview was performed for short time due to the challenges of COVID-19 pandemics which may result in inadequate responses from participants.

Conclusions

Nearly three-fourth of the managers working in public hospitals of North Shewa Zone uses the routine health information for decision-making. Training and supportive supervision are the determinants of routine health information use. Findings from the qualitative study showed that managers had a lack of computer and data analysis skills. The results also highlighted low motivation as an obstacle to using

the health information that was attributed to poor data quality and internet problems. Therefore, supportive supervision, training, and staff motivation are highly recommended.

Abbreviations

AOR
Adjusted Odd Ratio
CEOs
Chief Executive Officers
CI
Confidence Interval
COR
Crude Odd Ratio
CSA
Central Statistics Agency
ETB
Ethiopian Birr
HCWs
health care workers
HIT
Health Information Officers
HIS
Health Information System
IRB
Institutional Review Board
KII
Key Informant Interview
MAPH
Masters of Applied Public Health
MPH
Masters of Public Health
MSc.
Masters of Science
RHI
Routine Health Information
RHIU
Routine health information use
SPSS
Statistical Packages for Social Science
SPHMMC

St. Paul's Hospital Millennium Medical College

Declarations

Ethics approval and consent to participate

St. Paul's Hospital Millennium Medical College (SPHMMC), Institutional Review Board (IRB) approved this study (protocol number: pm 75/517). A letter of permission was obtained from North Shewa Zonal health department. After the objective of the study was explained, verbal consent was obtained from each participant. Moreover, privacy and confidentiality of information was strictly guaranteed by all data collectors and investigators.The information retrieved was used only for the study.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analysed during this study are included in this published article and its supplementary information files.

Competing interests

The authors declare that they have no competing interests.

Funding

Authors' contributions

GT conceived and designed the study, supervised the acquisition of the data, and carried out the statistical analysis. TGD and TT participated in the design of the study and tool development and approved the proposal with some revisions. TGD participated in the statistical analysis, drafted, and critically revised the manuscript. All authors read and approved the final manuscript.

Acknowledgments

Authors' information

GT (BSc, MAPH) is a health care worker at Kuyu General Hospital, North Shewa Zone of Oromia Regional State, Gerba Guracha, Ethiopia. TGD is an Assitant Professor (MPH) at the Department of Public Health, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. TT is a lecturer (MSc in Nutrition) at the Department of Public Health, St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia.

References

1. Karuri J, Waiganjo P, Orwa D, Manya A. District Health Information System: The Tool to Improve Health Data Demand and Use in Kenya. J Health Inform Dev Ctries. 2014;8(1):38–60.

2. Ethiopian Federal Ministry of Health. Information use training manual.Photogrammetric engineering and remote sensing. 2018.

3. Aqil A, Lippeveld T, Hozumi D. PRISM framework: A paradigm shift for designing, strengthening, and evaluating routine health information systems. Health Policy Plan. 2009;24(3):217–28.

4. Munda Mucee E, Odhiambo-Otieno G, Wambui Kaburi L, Kainyu Kinyamu R. Routine Health Management Information Use in the Public Health Sector in Tharaka Nithi County, Kenya. Imp J Interdiscip Res [Internet]. 2016;2(3):2454–1362.

5. Hotchkiss D, Diana M, Foreit K. How Can Routine Health Information System Improve Health System Function in Low-Resource Setting. 2012;44.

6. Ethiopian Federal Ministry of Health. Information Revolution Roadmap. 2016. Available from: www.moh.gov.et. Accessed 22 August 2019.

7. Heeks R. Health information systems: Failure, success, and improvisation. Int J Med Inform. 2006;75(2):125–37.

8. Nutley T, Reynolds HW. Improving the use of health data for health system strengthening. Glob Health Action. 2013;6(1).

9. Bello IS, Arogundade FA, Sanusi AA, Ezeoma IT, Abioye-Kuteyi EA, Akinsola A. Knowledge and utilization of information technology among health care professionals and students in Ile-Ife, Nigeria: A case study of a University Teaching Hospital. J Med Internet Res. 2004;6(4):5.

10. Kimani J, Kenyatta J. Factors Affecting the Utilization of Health Information Technology Projects in Nairobi County. 2015;2(57):286–315.

11. Kagaruki GB, Kimaro HC, Mboera LG. Factors affecting utilization of evidence-based health information system for an effective supply chain of essential medicine in Tanzania: a case study from Mbeya Region. J Health Inform Dev Ctries. 2013;7(1):62–75.

12. Wilson T. Implementing a new health management information system in Uganda. 2016;10–2.

13. Nicol E, Bradshaw D, Phillips T, Dudley L. Human factors affecting the quality of routinely collected data in South Africa. Stud Health Technol Inform. 2013;192(1–2):788–92.

14. Ethiopian Federal Ministry of Health. Health Management Information System Use Guide. 2013.

15. Asemahagn MA. Determinants of routine health information utilization at primary healthcare facilities in Western Amhara, Ethiopia. Cogent Med. 2017;4(1):1387971.

16. Dagnew E, Woreta SA, Shiferaw AM. Routine health information utilization and associated factors among health care professionals working at public health institution in North Gondar, Northwest Ethiopia. BMC Health Serv Res. 2018;18(1):1–8.

17. Abajebel S, Jira C, Beyene W. Utilization of the health information system at the district level in Jimma zone Oromia regional state, Southwest Ethiopia. Ethiop J Health Sci. 2011;21(Suppl 1):65–76.

18. Aqil A, Harrison T, Moreland S, Schmidt S, Nutley T, Measure Evaluation. A Review of Constraints to Using Data for Decision Making Recommendations to Inform the Design of Interventions A Review of Constraints to Using Data for Decision Making Recommendations to Inform the Design of Interventions. Meas Eval. 2010;1–13.

19. Mohr JJ, Batalden PB. Improving safety on the front lines: The role of clinical microsystems. Qual Saf Heal Care. 2014;11(1):45–50.

20. Adane T. Assessment on Utilization of Health Management Information System at Public Health Centers Addis Ababa City Administrative, Ethiopia. Internet Things Cloud Comput. 2017;5(1):7.

21. Abera E, Daniel K, Letta T, Tsegaw D. Utilization of Health Management Information System and Associated Factors in Hadiya Zone Health Centers, Southern Ethiopia. Res Heal Sci. 2016;1(2):98.

22. Hiwot Belay, Tariq Azim HK. Assessment of Health Management Information System (HMIS) Performance in SNNPR, Ethiopia. 2013;6–18.

23. Teklegiorgis K. Factors Associated with Low Level of Health Information Utilization in Resources Limited Setting, Eastern Ethiopia. Int J Intell Inf Syst. 2014;3(6):69.

24. Kihuba E, Gathara D, Mwinga S, Mulaku M, Kosgei R, Mogoa W, et al. The Health Services, Implementation Research, and Clinical Excellence (SIRCLE) Collaboration. Glob Health Action. 2014;2(7):24859.

25. Central Statistical Agency. of Ethiopia. Summary and statistical report. 2007.

26. MEASURE Evaluation. Performance routine information system management. 2012.

27. World Health Organization (WHO). Health Information Systems in Developing Countries. Vital wave Consult. 2009;69.

28. Ethiopian Federal Ministry of Health. Health Management Information System information use and data quality. 2014.

29. Emiru K, Oljira H, Ifa M. Assessment of Utilization of Health Information and Associated Factors at District Level in East Wollega Zone. Oromia Regional. 2018;44:9–17.

30. Obwocha W, Ayodo G, Nyangura A, Thomas O. Utilization of Healthcare Information Among Healthcare Workers in Gucha Sub-county, Kisii County, Kenya. J Heal Educ Res Dev. 2016;04(04).

31. World Health Organization (WHO). World health report; Global public health security in the 21st century. 2007.

Figures
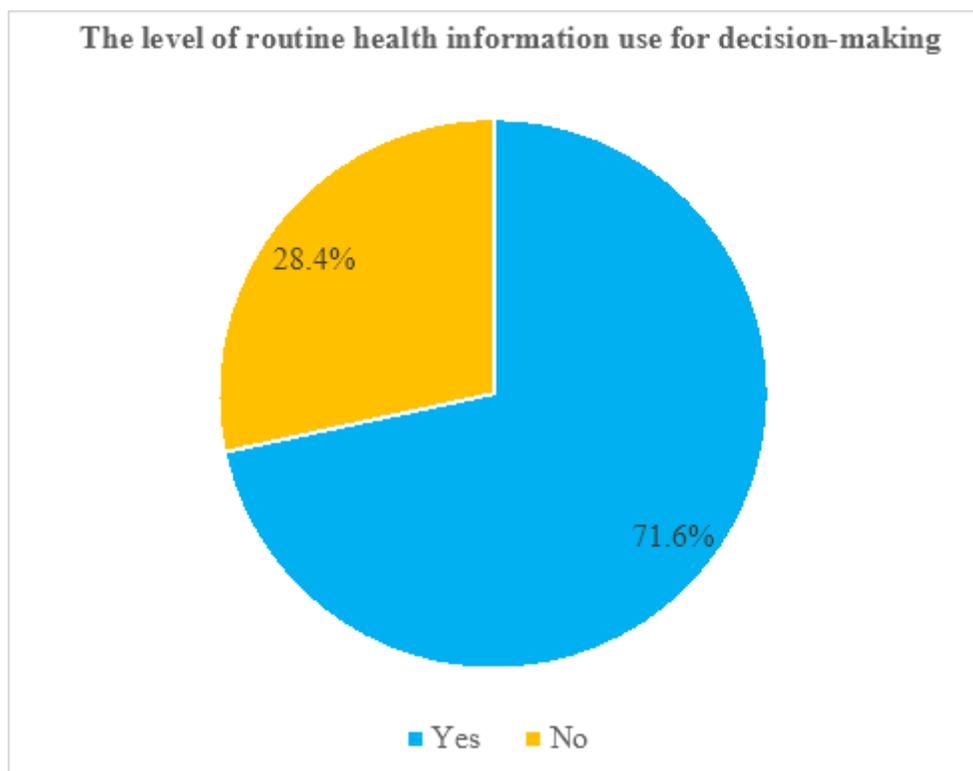
Figure 1

The level routine health information use among managers working at public hospitals in North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102)
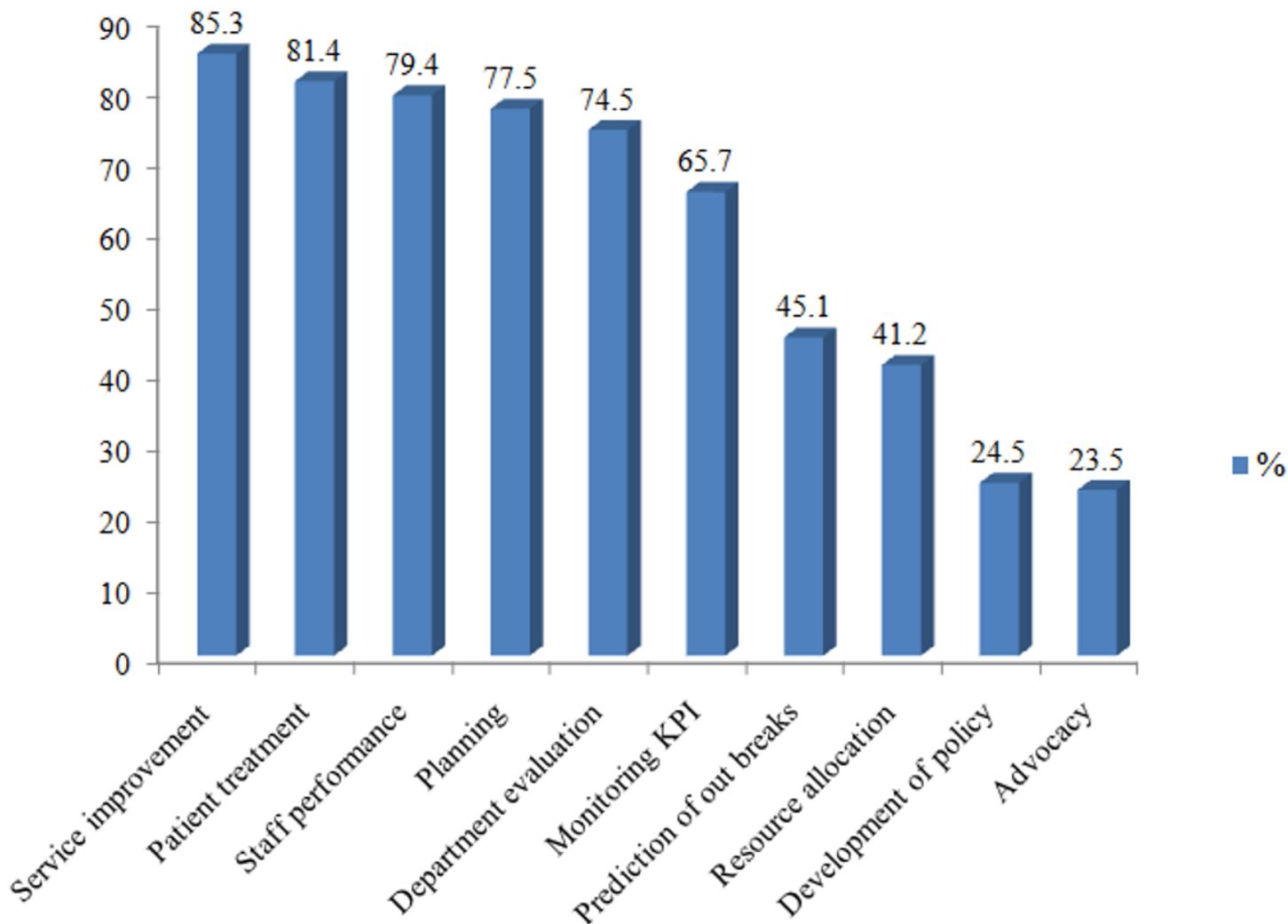
Figure 2

The purpose of using routine health information (RHI) by managers working in hospitals, North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102).
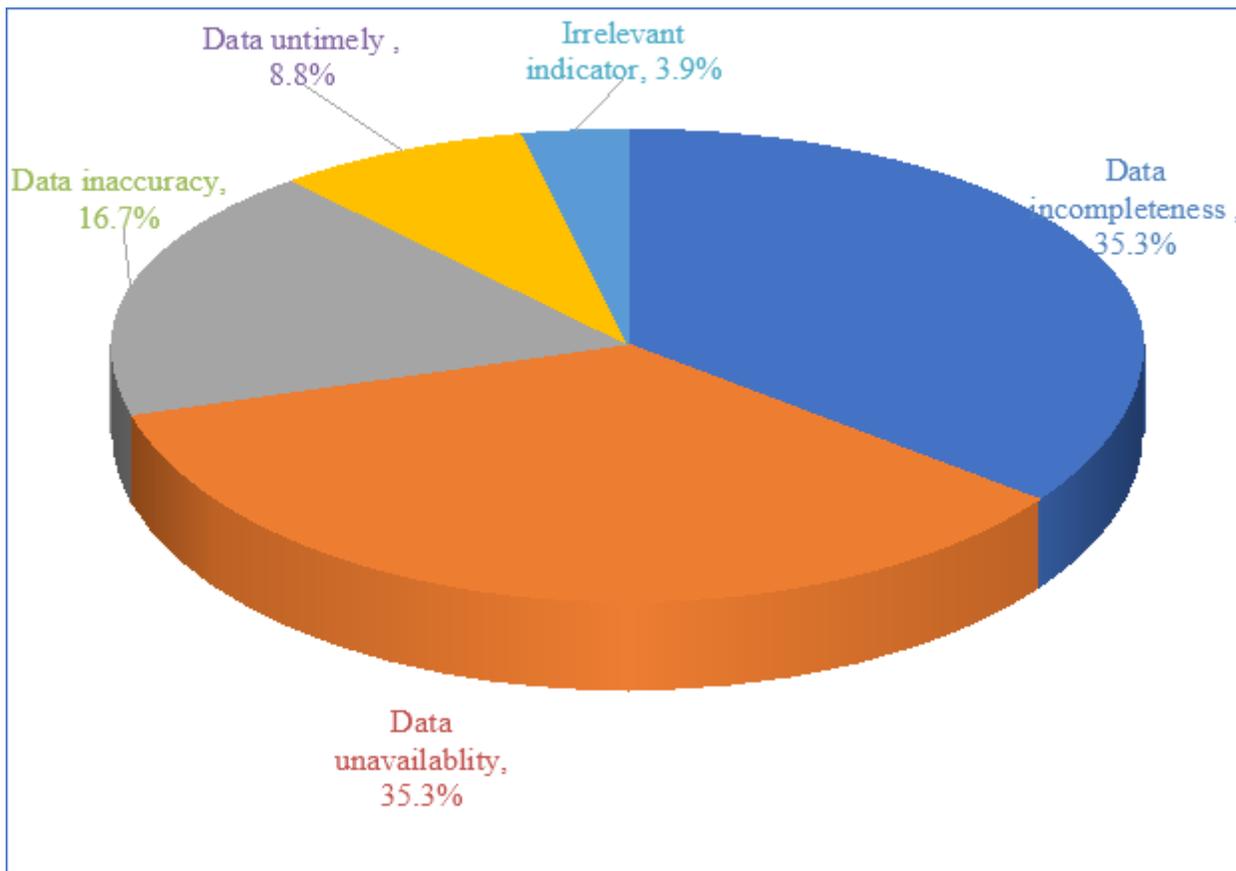
Figure 3

Problems encountered during routine health information use at public hospitals in North Shewa Zone, Oromia Regional State, Ethiopia, 2020 (n = 102)
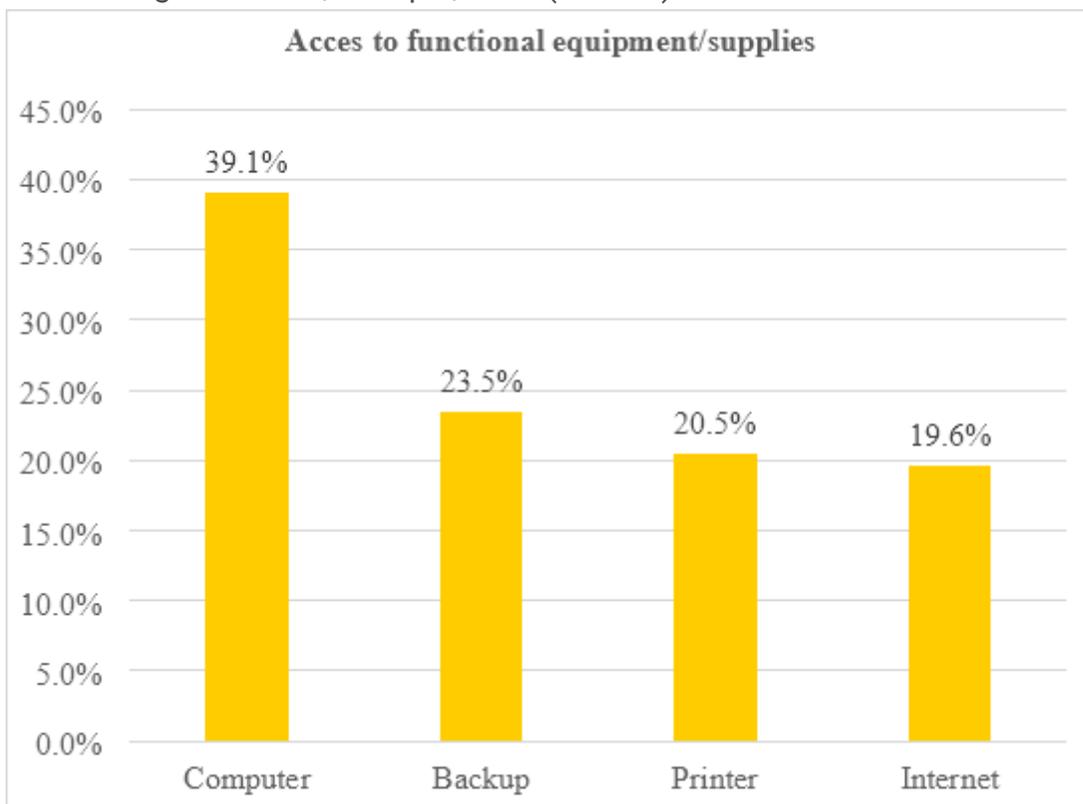
Figure 4

Access to functional equipment/supplies at public hospitals of North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102)
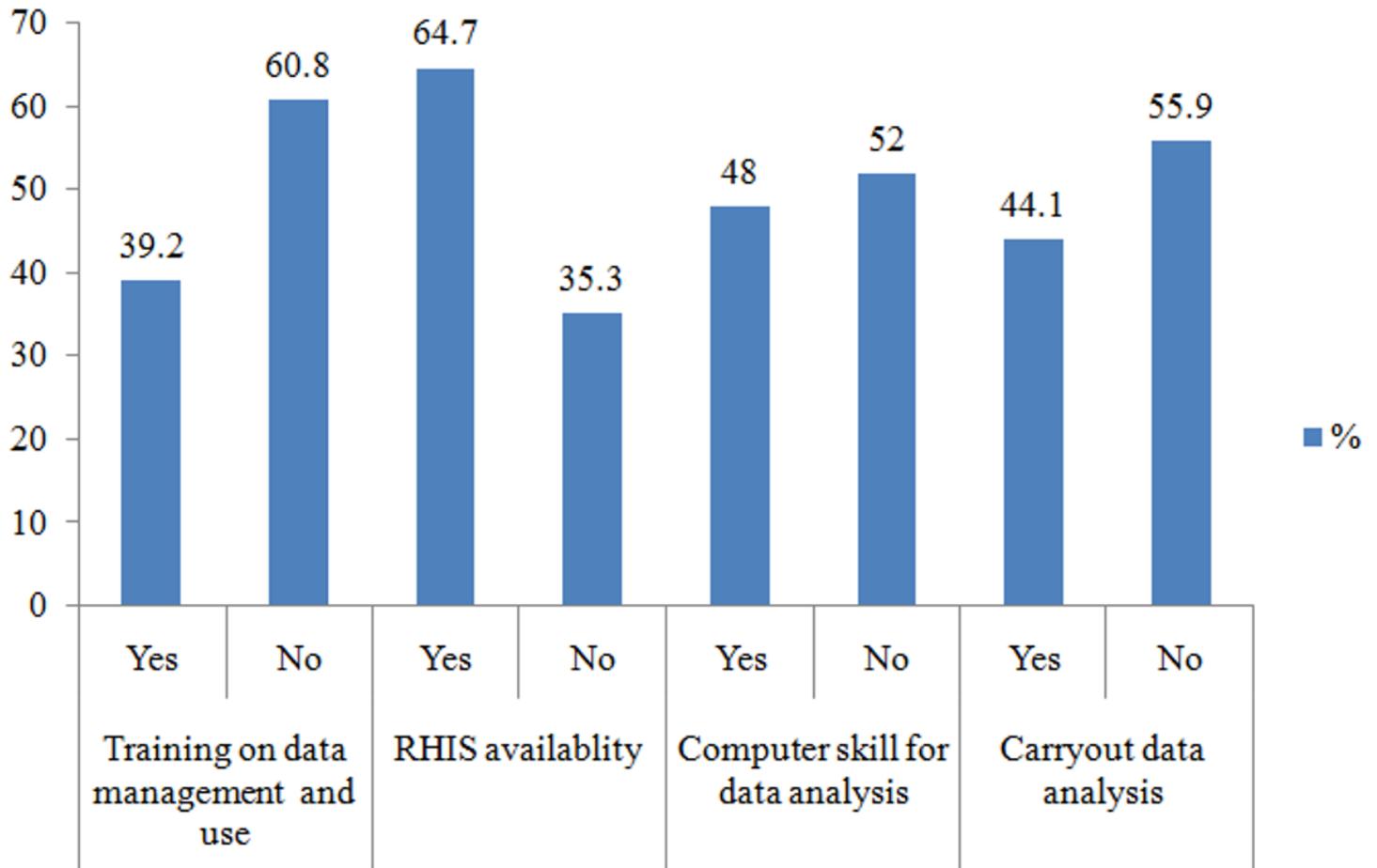

Figure 5

Technical characteristics of managers at hospitals in North Shewa, Oromia Regional State, Ethiopia, 2020 (n = 102)