

Research Article

Routine Health Information System Utilization and Its Associated Factors among Healthcare Professionals in Debre Berhan Town, Ethiopia

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Background. A routine health information system (RHIS) is a system that records, stores, and processes health data in order to enhance healthcare decision-making. However, systematic use of health information is still not used for program decisions in developing nations, particularly in Ethiopia. **Objective.** Identifying regular utilization of health information systems and related factors among healthcare workers in Debre Berhan Town health facilities, North Shoa, Amhara, Ethiopia, 2022. **Methods.** A facility-based cross-sectional study was conducted from February 22 to September 22, 2022 in Debre Berhan Town, Ethiopia. Data from participants were gathered using a self-administered, pretested structured questionnaire by employing a systematic random sample technique among healthcare workers at public health facilities. Data were entered into EpiData version 3.1 and analyzed using SPSS. We employed multivariable logistic regression and descriptive statistics. Variables with a p -value < 0.05 were considered statistically significant factors. Hosmer–Lemeshow goodness of fit was used to check the adequacy of the model. **Result.** A total of 383 workers were study participants with 100% response rate. The mean age was 32 (± 5.23). Utilization of routine health information among health professionals was 42.6%. Type of institution (AOR = 0.56), complexity of RHIS (AOR = 2.19), training on HMIS (AOR = 9.35), and feeling guilty of not accomplishing their performance (AOR = 2.96) were found significantly associated with routine health information utilization (RHIU). **Conclusion.** Utilization of RHIS among the health professionals was low. Type of institution, complexity of RHIS, data management skills, training on HMIS, and feeling guilty of not accomplishing their target performance were factors related to RHIS utilization. Comprehensive training and improve data management skills are highly recommended for improving RHIU.

1. Introduction

Routine health information system (RHIS) is the process of gathering, processing, utilization, and dissemination of health-related data for enhanced program, resource, and healthcare outcome [1]. Health information must be used often for daily patient management, illness prioritization, health education, resource allocation, decision-making, planning, evaluation, and monitoring of healthcare operations [2]. Along with resources, indicators, data sources, data management, information products, distribution, and use, it is one of the six components of a healthcare system. Producing and using information for other health system processes is its main goal. The purpose of a health information system is to deliver

high-quality health information that gives relevant evidence to help people make decisions about their health [3].

RHIS effectively reduces workloads while improving patient care standards. It helps with problem-solving and system improvement and is useful for identifying problems and gaps in the healthcare system [4]. Ethiopia has also created opportunities for District Health Information System (DHIS) utilization that disseminate user-friendly DHIS versions across entire regions of Ethiopia. “The Federal Ministry of Health (FMOH) is deploying and putting DHIS into practice to improve decision-making in public health facilities” [5].

Information that is thorough, accurate, detailed, and valuable falls under the category of quality information.

The quality of the information in the RHIS translates to quality data, which includes the data's comprehensiveness, validity, accuracy, and suitability for use, among other benefits, as information is the product of data transformation. RHIS is projected to provide precise and practical information for healthcare system planning and decision-making [6].

Healthcare workers in Ethiopia use the RHIS on average at 57.42%, which is lower than the amount considered to be acceptable nationally [2]. Similar findings from a study conducted in East Gojjam showed that just 45.8% of healthcare professionals regularly use health information at a high level [7]. According to another survey, routine health information (RHI) is used by 63.1% of people in Ethiopia's south region [8] and 69.3% of people in Hadiya zone's study units/departments of health centers [9].

Although the official expectation is 80%, the majority of indicators in Ethiopia's RHISs have poor data quality [10]. Moreover, in our study setting, little is known about the proportion of health information system utilization and the main associated factors that affect RHIS among healthcare professionals. Therefore, the goal of this study was to evaluate how frequently health professionals used the health information system and related parameters in the health facilities in Debre Berhan Town, North Shoa, Amhara, Ethiopia, in 2022.

2. Methodology

An institution-based cross-sectional quantitative survey including health professionals was conducted at Public Health Facilities in Debre Berhan North Shoa, Amhara region, Ethiopia, from February 22 to September 22, 2022. A total of 114,652 people live in the town, 51,843 of them men and 62,809 of them women, according to Central Statistical Authority (CSA) figures. The town has three medical facilities, nine health posts, a reputable comprehensive specialized hospital, and a private hospital. It is located 130 km north-east of Addis Ababa, the nation's capital. There are currently 504 medical experts working in the Debre Behan hospital and 54, 45, and 47 in 04, 07, and 08 Kebele health centers, respectively.

2.1. Inclusion and Exclusion Criteria. All medical professionals with more than 6 months of experience working in Debre Berhan Town public health facilities were included in the study during the data collection period. However, medical staff members on extended study leaves were not included in the study during the data collection.

2.2. Sample Size Determination. "The sample size was determined by using a single population proportion technique using the following assumptions (95% confidence interval and $Z_{\alpha/2}$ with a significant level of alpha (α) of 0.05, which is 1.96. A 5% margin of error ($d=0.05$), $P=79\%$ which is the study conducted in North Gondar" [1]. The sample size becomes 255. So with adjustment for 1.5 design effect the subjects were chosen by using probability proportional to sample size. A z -value of 1.96 was used at 95% CI and d of 5% (n =sample size, p =probability, d =margin of error). $n = z^2 p (1-p) / d^2 \times \text{design effect}$, $n = (1.96)^2 \times (0.79)(0.21) / (0.05)^2 \times 1.5 = 0.64 /$

$(0.05)^2 \times 1.5 = 383$. Therefore, after adjusting for design effect, the total study participants were 383 health professionals.

2.3. Sampling Technique and Procedure. Stratified sampling technique was used to recruit study subjects from public health facilities in Debre Berhan town (one hospital and three health centers). Health professionals who completed the self-administered questionnaire were chosen by a rigor's random selection process. First, the study participants were chosen based on their occupations using the stratified sample technique then, after the division of health workers into professions. The necessary sample size was calculated in accordance with the size of the preferred healthcare facility. The total number of health facility employs who worked during the study period and the number of samples needed in each chosen health facility were used to conduct systematic random sampling in order to obtain the individual sample at the chosen health institution. The first participant was chosen by random out of the first "k" units after obtaining the sampling fraction in the chosen factory (Figure 1).

3. Data Collection Method and Procedures

An organized interview instrument was used to collect the data. Additionally, we pretested the tool on 5% of research participants and found that it was appropriate for the study. The literature was used to select variables that might affect how frequently healthcare professionals use health information systems. To ensure the consistency of the questionnaire, the quantitative data were initially prepared in English, translated to Amharic, the native language, and then translated back to English.

Four health information technicians who worked in the Woreda health office and health facility gathered the necessary data. Data collectors received instruction on several aspects of the study. Technical, behavioral, and organizational aspects are the main determinants of adoption of RHISs, and these elements were taken into consideration when developing the questionnaire based on the revision and conclusions of the pertinent literature study. The questionnaire consists of five main parts. Part 1 includes sociodemographic factors (measured with seven items), Part 2 is related to technical factors (measured with Min 0 and Max 10 scores), Part 3 assessed organizational factors (measured with Min 0 and Max 10 scores), Part 4 were about behavioral factors (measured with Min 10 and Max 50 scores), and Part 5 was about the outcome variable routine health information utilization (RHIU) (measured with Min 15 and Max 75 scores).

Technical and organizational factors have each 10 questions with a response of Yes or No questions. Behavioral factors affecting of RHIU of the respondents were assessed using 5-point Likert scale questions that ranged from "1 = strongly disagree" to "5 = strongly agree". The fact that participation was optional and that there were no conditions on withdrawal was also made clear to participants. Acknowledgment was sent to study participants in order to collect the essential data from them.

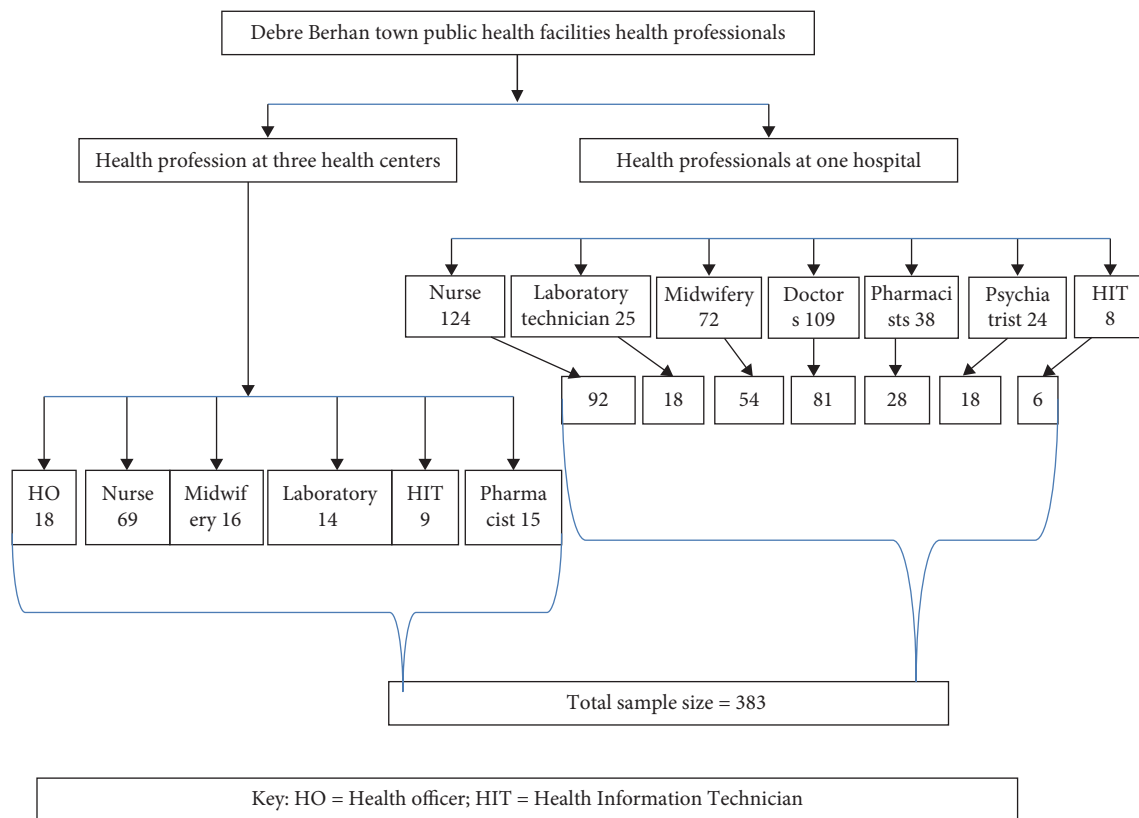


FIGURE 1: Sampling procedure for the level of routine health information utilization and associated factor among public health facilities, Debre Berhan, Ethiopia.

3.1. Operational Definitions

3.1.1. *Technical Factors.* Lack of skills in information presentation, information use, data collection, and presence of standard indicators, complexity of HIS report formats, HIS require employ trained personnel, have you taken training, use both manual and computer-based files and need trained person to fill format.

3.1.2. *Organizational Factors.* Organizational rules, values, financial and human resources, regular feedback, supportive supervision, reward for good work, take orientation on RHIS during employment, meeting review action plans, and use Health Management Information System (HMIS) data day-to-day management.

3.1.3. *Behavioral Factors.* Collected information not customized patient treatment, lack of motivation incentives, collecting information adds no value for RHIU activities, RHIS data collection had benefit of patient, collecting information gives a feeling burden, understand, and appreciate my roles and responsibilities, data collection is meaningful for you, feeling guilty if not accomplishing their target, RHIU is useless, RHI is useful for monitoring facilities performances.

4. Data Processing and Analysis

Using Epi-data version 3.1, the acquired data was entered and carefully reviewed for accuracy. In order to further clean and analyze the entered data, the data was exported to SPSS

version 21. The data was edited, coded, checked, and organized to provide a format appropriate for additional analysis. The content validity index (CVI) is generated for the entire test after the inclusion of domains and indicators has been determined. CVI is just the average of all domain and indicator CVR values that fulfill the CVR cut off of 0.62. The Hosmer–Lomeshow goodness of fit test was used to evaluate the model’s fitness. Variance inflation factor (VIF) and a normal P–P plot were used to verify model assumptions such as multicollinearity and outlier, respectively. In order to determine the strength of the link, each independent variable was fitted independently into a binary logistic regression model. A multiple logistic regression model was fitted to the variables with a *p*-value of less than 0.20 [11]. In order to find independent variables that were substantially associated with the use of RHIS, an Adjusted Odds Ratio (AOR) value with a 95% confidence interval was determined. A *p*-value of 0.05 was utilized as the level of significance for the final qualifiers as factors associated with RHIS utilization.

Behavioral factors have a 5-point Likert scale measure, ranging from “1 = strongly disagree” to “5 = strongly agree”. After data collection the Likert scale questioners changed in to Yes/No form for analysis purposes. First each 10-item Likert scale questions ranging from “1 = strongly disagree” to “5 = strongly agree” recodes in to 0 and 1. If the health professional respond this Likert scale questions ranging from 1 = strongly disagree to 3 = neutral labeled as 0 whereas value from 4 = agree to 5 = strongly agree labelled as 1 (or 0 denoted

as No and 1 denoted as Yes). RHIU have a 5-point Likert scale measure, ranging from “1 = strongly disagree” to “5 = strongly agree”.

5. Result

5.1. Sociodemographic Characteristics of Health Professionals.

A total of 383 health professionals were involved in the study, giving a response rate of 100%. Their mean age (\pm SD) was 32.08 (\pm 5.23) years, half (51.4%) of the study participants were male. Regarding level of education, from the total interviewed individuals, shows that 90 (23.5%) were diploma holders, majority (61.9%) of the study participants were bachelor's degree holders. Moreover, 142 (37%) of the participants were nurses (Table 1).

5.2. Technical Factor. Of the total respondents, 329 (85.9%) reported having a set of indicators that they use regularly to use health information. The complexity of regular health information systems, according to 228 respondents (59.5%), makes it difficult for users to make use of the system. Health practitioners used both manual paper and computer-based files for information recording in 221 (42.3%) cases. Approximately 362 (94.5%) of the participants had HMIS training in the previous year. The majority of 181 persons (47.3%) had good technical factors that affect how frequently they use health information (Table 2).

5.3. Organizational Factors. Health professionals made up 302 (78.92%) of the study's participants, and they all agreed that organizational norms, values, and practises have a positive influence on RHIS. The next higher health authority was reportedly in charge of supervising 342 (89.3%) of the respondents, and 358 (93.5%) of the respondents frequently heard from it. About 84.1% of health professionals thought that regular staff meetings are crucial for reviewing the action plans of health facilities. Around 80.9% of health employs receive commencing orientation while they are employed. Generally, 180 (47.0%) health professionals were good at organizational factors consideration (Table 3).

5.4. Behavioral Factors. Regarding behavioral variables, more than half of participants (303, or 79.1%) thought that regular health information was helpful for assessing the performance of healthcare institutions. A majority of 367 respondents, or 95.8%, said they understood and valued their duties and responsibilities in relation to managing health information. A total of 168 health professionals (43.9%) believed that gathering data added little value to their work. About 323 (84.3%) of the participants feel bad about not meeting their goals and performing as expected, and most health professionals, 299 (78.1%), said that routinely using health information data gathering for patients' and HFs' benefit (Table 4).

5.5. Routine Health Information System Utilization. In this study, the majority (93.7%) of respondents reported using routine health data frequently for treating patients, 94% of respondents believed that good quality data were used for patient utilization, 92.4% of respondents reported using disease data and drug stock outs, 87.2% of respondents reported

TABLE 1: Sociodemographic characteristics healthcare professionals in routine health information system utilization and its associated factors from in 2022 in Debre Birhan North Shoa, Amhara region Ethiopia ($n = 383$).

| Variables | Frequency | Percentage (%) |
|---------------------|-----------|----------------|
| Sex of participants | | |
| Male | 197 | 51.4 |
| Female | 186 | 48.6 |
| Age of participants | | |
| 20–24 | 14 | 3.66 |
| 25–29 | 104 | 27.15 |
| 30–34 | 127 | 33.16 |
| 35–39 | 113 | 29.50 |
| 40 and above | 25 | 6.53 |
| Department | | |
| Out patient | 199 | 31.07 |
| Pharmacy | 55 | 14.36 |
| MCH | 70 | 18.28 |
| Laboratory | 43 | 11.23 |
| Emergency | 49 | 12.79 |
| Plan | 23 | 6.01 |
| Core processor unit | 24 | 6.27 |
| Educational status | | |
| Diploma | 90 | 23.5 |
| Degree | 237 | 61.9 |
| Master and above | 56 | 14.6 |
| Type of institution | | |
| Hospital | 297 | 77.5 |
| Health centers | 86 | 22.5 |
| Job title | | |
| Doctors | 81 | 21.1 |
| Health officers | 13 | 3.4 |
| Pharmacy | 36 | 9.4 |
| Midwifery | 59 | 15.4 |
| Nurse | 142 | 37 |
| Psychiatry | 18 | 4.7 |
| HIT | 9 | 2.5 |
| Laboratory | 25 | 6.5 |
| Experience year | | |
| 7 month 5 years | 63 | 16.4 |
| 6–10 years | 201 | 52.5 |
| 11 and above | 119 | 31 |

receiving feedback on monthly reports, 86.7% of respondents reported allocating resources based on evidence-based gaps, 86.9% of respondents reported improving service delivery based on evidence, 86.5% of respondents reviewed strategies by looking at target performance, and utilization of RHIS as a whole was 42.5% (95% CI: 37.6%, 47.8%) (Table 5).

5.6. Bivariable and Multivariable Binary Logistic Regression Analysis. In the bivariable logistic regression factors associated with RHIU: type of institution, standard set of indicators, complexity of RHIS, HIS data entry require trained personnel,

TABLE 2: Technical characteristics of healthcare professionals in routine health information system utilization in Debre Berhan town, Ethiopia, 2022.

| Variables | Frequency | Percentage |
|--|-----------|------------|
| Did you have standard set of indicators? | | |
| Yes | 329 | 85.9 |
| No | 54 | 14.1 |
| Complexity of RHIS makes hard to health workers to utilize health information system | | |
| Yes | 288 | 59.5 |
| No | 155 | 14.1 |
| HIS require employment of trained personnel for data entry | | |
| Yes | 137 | 35.8 |
| No | 246 | 64.2 |
| Use both manual and computer-based recording | | |
| Yes | 221 | 42.3 |
| No | 162 | 57.7 |
| Did you ever attend training on Health Information System (HIS) the last? 12 months | | |
| Yes | 362 | 94.5 |
| No | 21 | 5.5 |
| Do you agree that trained person able to fill format? | | |
| Yes | 319 | 83.3 |
| No | 64 | 19.6 |
| Do you have discussion on monthly PMT? | | |
| Yes | 308 | 80.4 |
| No | 75 | 19.6 |
| Lack of skills in data collection | | |
| Yes | 97 | 25.3 |
| No | 286 | 74.7 |
| Lack of skills in information presentation | | |
| Yes | 136 | 35.5 |
| No | 247 | 64.5 |
| Lack of skills in information use | | |
| Yes | 147 | 38.4 |
| No | 236 | 61.6 |
| Aggregate technical factors | | |
| Good | 181 | 47.3 |
| Poor | 202 | 52.7 |

use of both manual paper and computer-based files, feeling guilty not accomplishing their targets, orientation on data collection during employ, discussion on monthly performance, information use skills, supportive supervision, provision of regular feedback, trained in data management and use, reward for good work were factors associated with good RHIU at a p -value of less than 0.25 (Table 6).

5.7. Multivariate Analysis of Associated Factors. With the use of RHI, the bivariable logistic regression analysis revealed significant associations between sociodemographic characteristics type of institution, level of education, working department, and year of experience at p -values 0.25. The crude odds ratio for one of the factors thought to influence how frequently people use RHI revealed that it was always very significant.

However, following corrected multiple logistic regression, the bulk of those covariates are not statistically significant.

In this study, higher odds of good RHIS utilization were noted among health professionals who had perceived complexity of RHIS formats (AOR = 2.18; 95% CI: 1.23, 3.88), training on HMIS (AOR = 8.94; 95% CI: 1.77, 18.55), and feeling guilty if not accomplishing their target and performances (AOR = 2.96; 95% CI: 1.33, 6.60) and those who were working at hospitals (AOR = 2.10; 95% CI: 0.74, 2.82). As the result indicates, type of institution was found to be significantly associated with RHI use (AOR = 2.10; 95% CI: 1.028, 4.502). Those health professionals who work in hospitals were 2.10 times more likely to utilize good RHI than those who work in health centers.

Complexity of RHIS was found to be significantly associated with good RHI use (AOR = 2.19; 95% CI: 1.23, 3.88). The

TABLE 3: Organizational characteristics of healthcare professionals in routine health information system utilization in Debre Berhan town, Ethiopia, 2022.

| Variables | Frequency | Percentage |
|---|-----------|------------|
| Organizational rules, values and practices | | |
| Yes | 302 | 78.9 |
| No | 81 | 21.1 |
| Inadequate human resource impact on RHIU? | | |
| Yes | 311 | 81.2 |
| No | 72 | 18.8 |
| Lack of financial resource impact on RHIU? | | |
| Yes | 312 | 81.5 |
| No | 71 | 18.5 |
| Did you supportive supervision in last 6 months? | | |
| Yes | 342 | 89.3 |
| No | 41 | 10.7 |
| Have you received regular feedback on RHIU | | |
| Yes | 358 | 93.5 |
| No | 25 | 6.5 |
| Take starting orientation on HIS during employ | | |
| Yes | 310 | 80.9 |
| No | 73 | 19.1 |
| Regular staff meetings to review action plans | | |
| Yes | 322 | 84.1 |
| No | 61 | 15.9 |
| Are you trained in data management and use? | | |
| Yes | 201 | 52.5 |
| No | 182 | 47.5 |
| Staff are reward for their good work | | |
| Yes | 167 | 43.6 |
| No | 216 | 56.4 |
| Use HMIS data for day-to-day management of facility | | |
| Yes | 189 | 49.3 |
| No | 194 | 50.7 |
| Aggregate organizational factors | | |
| Good | 180 | 47.0 |
| Poor | 203 | 53.0 |

odds of RHIU were hard about 2.19 times higher (AOR = 2.19; 95% CI: 1.23, 3.88) among health profession who perceived low complexity RHIS when compared than who perceived simplicity (noncomplexity) of RHIS formats. HMIS training in the last 12 months was found to be significantly associated with good RHI use (AOR = 8.94; 95% CI: 1.77, 18.55). Health professionals who had taken HMIS training on in the last 12 months were found to be 8.94 times more likely to utilize RHIS at their health facilities than those not taken HMIS training.

Feeling guilty of not accomplishing their target and performances were found to be significantly associated with good RHI use (AOR = 2.96; 95% CI: 1.33, 6.60). Health professionals who feeling guilty of not accomplishing their target and performances were 2.96 times (AOR = 2.19; 95% CI: 1.23, 3.88) more likely utilize RHIS when compared with these who perceived not feeling guilty of not accomplishing their target performance (Table 6).

6. Discussion

This study aimed to assess the parameters associated with RHIU by healthcare professionals in Debre Berhan Town public health facilities in North Shoa, Ethiopia. Overall, 42.6% of healthcare professionals used regular health information efficiently, according to the study's findings. The way regular health information was used by healthcare practitioners was typically unsatisfactory and fell short of what was anticipated on a national level. A study showed that, 57.42% of the time, health professionals in Ethiopia gathered RHI [2]. The health professionals' perception of the RHIS formats' complexity, their lack of HMIS training, and their lack of data management expertise could all be contributing factors to the low levels of RHIU shown in this study.

This finding was almost in line with a study finding in Addis Ababa health centers where utilization of HMIS at health facilities was 41.7% [12]. However, this finding is

TABLE 4: Behavioral characteristics of healthcare professionals in routine health information system utilization in Debre Berhan town, Ethiopia, 2022.

| Variables | Frequency | Percentage |
|--|-----------|------------|
| Routine health information utilization is useless | | |
| Yes | 342 | 89.3 |
| No | 41 | 10.7 |
| Data collection meaningful to me | | |
| Yes | 326 | 85.1 |
| No | 57 | 14.9 |
| Lack of motivating incentives | | |
| Yes | 304 | 79.4 |
| No | 79 | 20.6 |
| Collecting information adds no value for my activities | | |
| Yes | 168 | 43.9 |
| No | 215 | 56.1 |
| Routine health information is useful for monitoring facilities performances | | |
| Yes | 303 | 79.1 |
| No | 80 | 20.9 |
| Collected data are not customized to patient treatment | | |
| Yes | 179 | 46.7 |
| No | 204 | 53.3 |
| Feeling guilty of not accomplishing targets and performance | | |
| Yes | 323 | 84.3 |
| No | 60 | 15.7 |
| Frequent use of routine health information data collection had benefit of patient as well as HFs | | |
| Yes | 299 | 78.1% |
| No | 84 | 21.9% |
| Collecting information gives a feeling burden | | |
| Yes | 241 | 52.9% |
| No | 142 | 47.1% |
| Understand and appreciate your roles and responsibilities | | |
| Yes | 367 | 95.8% |
| No | 16 | 4.2% |

higher than that of a study conducted in Cote'dvorie (38%) [13], Kenya (34%) [14] and, Jimma zone 32.9% [15]. The possible explanations for this variation might be due to differences in study period and recent governmental concern for RHIU. It justifies that in the former study there is no information technician at each institution but nowadays more than 80% of health facilities has such technician. It was also higher than the study finding at health facilities in Western Amhara in which good utilization of RHIS was 38.4% [16]. This variation might be the study conducted only in health center and department or unit heads, in the current study in which all healthcare professional working in hospital and health centers were included.

"The utilization of RHI among health professionals of this study was higher than a study conducted in Addis Ababa city in which odd of utilization of RHIS was 37.3%" [6]. This variation might be the study conducted only health center in all the study units or departments of health centers. In this study both health centre and hospital incorporated. This

implies that emphasis given by health workers and district offices in Addis Ababa to strengthen RHIS was very low.

The outcome of this trial, however, was less favorable than that of the Ghanaian study [17]. The extent and scope of the study's study area and subject matter are two considerations that can apply to this difference. Unlike the study in Ghana, which also covered district, community, and other health offices, the current study primarily paid attention to public health institutions. Additionally, Ghana has had a longer period than Ethiopia for the establishment of DHIS. This finding was also less than that of a study conducted in North Gondar, which found that the trend of RHI usage among health professionals was (78.5%) [1]. This might be due to health professionals in North Gondar have available standard set indicators at their offices, good governance, and good data analysis skills.

Compared to a study conducted in the Hadiya zone 69.3% [18], health professionals in this study used less health information, and East Gojjam zone 45.8% [7]. This variation

TABLE 5: Routine health information utilization among healthcare professionals in Debre Berhan town, Ethiopia, 2022.

| Variables | Frequency | Percentage |
|--|-----------|------------|
| Use of RHI data collection had benefit to patient | | |
| Yes | 359 | 93.7 |
| No | 24 | 6.3 |
| HF gets feedback on monthly reports | | |
| Yes | 334 | 87.2 |
| No | 49 | 12.8 |
| Decision making on quality information data is collected timely | | |
| Yes | 198 | 51.7 |
| No | 185 | 48.3 |
| Decision made based on RHI findings | | |
| Yes | 226 | 59 |
| No | 157 | 41 |
| Good quality data used for patient utilization | | |
| Yes | 360 | 94 |
| No | 23 | 6 |
| Data quality used for disease data | | |
| Yes | 354 | 92.4 |
| No | 29 | 7.6 |
| Data routinely used to monitor indicator performance | | |
| Yes | 347 | 90.6 |
| No | 36 | 9.4 |
| Information users seek feedback | | |
| Yes | 344 | 89.8 |
| No | 39 | 10.2 |
| Exchange information with other stakeholders | | |
| Yes | 162 | 42.3 |
| No | 221 | 57.7 |
| Information based decision made at all levels of facility management | | |
| Yes | 226 | 59 |
| No | 157 | 41 |
| Action plan showing decision based on RHI | | |
| Yes | 318 | 83 |
| No | 65 | 17 |
| Review strategy by examining target performance | | |
| Yes | 277 | 86.5 |
| No | 106 | 13.5 |
| Priority allocation resources based on evidence based gaps | | |
| Yes | 332 | 86.7 |
| No | 51 | 13.3 |
| Stakeholders rely on data for planning service | | |
| Yes | 144 | 37.6 |
| No | 239 | 62.4 |
| Decision based on evidence improve services delivery | | |
| Yes | 333 | 86.9 |
| No | 50 | 13.1 |
| Routine health information utilization | | |
| Good | 163 | 42.5 |
| Poor | 220 | 57.5 |

TABLE 6: Multivariate analysis of parameters linked to RHIS usage using logistic regression HCPS in Debre Berhan town, Ethiopia, 2022.

| Variables | RHIU | | Crude OR | AOR | p-Value |
|--|------|------|---------------------|--------------------|---------|
| | Good | Poor | | | |
| Educational status | | | | | |
| Diploma | 39 | 51 | 1.21 (0.96, 1.54) | 1.14 (0.85, 1.53) | 0.374 |
| Degree | 92 | 145 | | 1 | |
| Masters and above | 32 | 32 | | | |
| Type of institution | | | | | |
| Hospitals | 138 | 159 | 2.12 (1.11,4.65) | 2.10 (0.26, 2.98) | 0.042 |
| Health centers | 25 | 61 | | 1 | |
| Years of experience | | | | | |
| 7 month 5 years | 23 | 40 | 1.27 (1.020, 1.58) | 1.10 (0.83, 1.46) | 0.514 |
| 6–10 years | 81 | 120 | | 1 | |
| ≥11 years | 59 | 60 | | | |
| Complexity of RHIS | | | | | |
| Yes | 120 | 108 | 2.89 (1.869, 3.16) | 2.24 (1.23, 3.94) | 0.005 |
| No | 43 | 112 | | 1 | |
| HIS require employment of trained personnel | | | | | |
| Yes | 69 | 68 | 1.64 (1.076, 2.50) | 0.82 (0.43, 1.56) | 0.549 |
| No | 94 | 152 | | 1 | |
| Use both manual paper and computer files for record | | | | | |
| Yes | 104 | 117 | 1.55 (1.025, 2.50) | 1.35 (0.76, 2.39) | 0.311 |
| No | 59 | 103 | | 1 | |
| Did you starting orientation | | | | | |
| Yes | 137 | 173 | 1.43 (0.844, 2.43) | 0.91 (0.46, 1.83) | 0.799 |
| No | 26 | 47 | | 1 | |
| Discussion on performance progress | | | | | |
| Yes | 138 | 170 | 1.62 (0.956, 2.76) | 1.09 (0.55, 2.18) | 0.806 |
| No | 25 | 50 | | 1 | |
| Provision of feedback | | | | | |
| Yes | 158 | 200 | 3.16 (1.160, 8.36) | 1.33 (0.36, 4.95) | 0.672 |
| No | 5 | 20 | | 1 | |
| Did you trained in data management and use | | | | | |
| Yes | 99 | 102 | 1.79 (1.186, 2.20) | 1.51 (0.89, 2.56) | 0.128 |
| No | 64 | 118 | | 1 | |
| Reward for good work | | | | | |
| Yes | 77 | 90 | 1.29 (0.860, 1.95) | 0.99 (0.57, 1.72) | 0.981 |
| No | 86 | 130 | | 1 | |
| Collected data are useful for monitoring performance | | | | | |
| Yes | 134 | 169 | 1.34 (0.838, 2.32) | 0.78 (0.40, 1.52) | 0.464 |
| No | 29 | 51 | | 1 | |
| Use HMIS data for day-to-day facilities management | | | | | |
| Yes | 96 | 132 | 1.57 (1.047, 2.37) | 1.2 (0.71, 2.04) | 0.490 |
| No | 67 | 88 | | 1 | |
| Did take training on HMIS | | | | | |
| Yes | 161 | 201 | 7.61 (1.747, 23.15) | 8.94 (1.77, 18.55) | 0.005 |
| No | 2 | 19 | | 1 | |
| Lack motivation incentives | | | | | |
| Yes | 140 | 164 | 2.018 (1.217, 3.55) | 1.15 (0.57, 2.30) | 0.695 |
| No | 23 | 56 | | 1 | |

TABLE 6: Continued.

| Variables | RHIU | | Crude OR | AOR | <i>p</i> -Value |
|--|------|------|---------------------|--------------------|-----------------|
| | Good | Poor | | | |
| Feeling guilty not accomplishing their targets | | | | | |
| Yes | 129 | 169 | 1.97 (1.127, 3.43) | 2.77 (1.26, 6.09) | 0.012 |
| No | 34 | 24 | | 1 | |
| Understand and appreciate roles and responsibilities | | | | | |
| Yes | 157 | 207 | 3.35 (0.939, 11.95) | 2.66 (0.57, 12.35) | 0.063 |
| No | 6 | 13 | | 1 | |
| Technical factors computed | | | | | |
| Yes | 84 | 101 | 1.09 (1.012, 1.16) | 0.58 (0.28, 1.20) | 0.144 |
| No | 79 | 119 | | 1 | |
| Organization factor computed | | | | | |
| Yes | 75 | 87 | 1.097 (1.014, 1.19) | 0.77 (0.40, 1.46) | 0.420 |
| No | 88 | 133 | | 1 | |
| Behavioral factor computed | | | | | |
| Yes | 74 | 89 | 1.14 (1.02, 1.19) | 1.1 (0.67, 88) | 0.654 |
| No | 89 | 131 | | 1 | |

might be due to this study conducted only health centers and also good data handling skills, data analysis skills, and data information presentation skills of health professionals. But in the current study both health center and hospital participated. Similarly this study finding was lower than the study conducted in Dire Dawa (53.1%) [19], and a study conducted in resource limited setting, Ethiopia 53.1% [20]. This might be due to health professionals had friendly format for reporting, good supportive supervision, and provide regular feedback to their staffs. This justifies that complicity of RHIS formats in the current study hard to utilize RHIS.

This study also lower than a study conducted in southwest Ethiopia 57.3% [5] and another study in East Wollega (57.9%) [21]. This might be due to trained and good staff motivation, regular supervision, regular feedback, and decision based on superior directives and performance monitoring by health professionals. And also, in this study health professionals RHI use is poor when compared to study done in North Wollo where the utilization of RHI among health professionals was 58.4% [22]. This might be due to health professional's good perceived culture of health information use, standard set of indicators, and government special emphasis to the utilization of RHI for evidence-based decision making and HMIS training. Similarly, the finding was lower than those of studies reported from outside Ethiopia that is Uganda (59%) [23], Tanzania (60%) [24]. This might be due to the difference in health information system structures and health professional attitude for RHIS.

Multivariable logistic regression analysis shows type of institution was significant association with RHIU. In this study health professional working at hospital were two times higher to utilize RHIS when compared with those working at health centres. The proportion of good health information utilization was 29.07% at health centers and 46.46% at

hospital. In contrast, a study conducted in East Gojjam [7], and North Gondar [1] the odds of utilization RHI was higher among health workers at health centres 84.9% when compared with those at hospital. This might be because there were well established RHISs and presence of better organizational support at hospital encourages staff to use RHI for evidence-based decision than health centers.

Complexity of health information system was another determinant factor of RHIU. Health professionals who had low perceived complexity of RHIS were two times more likely utilize RHI when compared than who perceived complexity of RHIS. This result supported by a study conducted in Addis Ababa city administration, 2022 [25], Dire Dawa [19], eastern Ethiopia Health professionals who had low perceived complexity of RHIS were two times more likely utilize RHI when compared than their counterpart [19, 25]. This is might be due to complexity of RHIS makes hard to utilize RHI.

The odds of utilization RHI were about nine times higher among trained health professionals when compared with health professionals who are not trained on RHI. This study supported by a study conducted in Illu Aba Bora zone, southwest Ethiopia, Hodiya zone, a systematic review, and meta-analysis study in Ethiopia, Oromia special zone Amhara, North Wollo zone, [2, 5, 18, 22, 26]. This result also supported by a study conducted in East Gojjam, HMIS training were significant association with RHIU.

In contrast, a study conducted in North Shoe zone, Oromia region, Ethiopia, the odds of RHIU were 0.72 times less likely utilize health information system among health professionals who had taken training on health information system when compared with health workers who are not trained on RHI [27]. This might be due to health professionals perceived feeling guilty not accomplished their target performance timely in the current study.

The odds of RHIU among health professionals were three times more likely to utilize RHIS among health professionals who had perceived feeling guilty if not accomplishing their target performance on time when compared with those who not feeling guilty of not accomplishing their target performance.

7. Conclusion

This study found that the overall utilization of RHI among health professionals was low. Type of institution, complexity of RHIS, taking training on data managements in the last 1 year, and feeling guilty not accomplishing their target performance were found to have significant associations with RHIU. The study suggested further investigation on culture of health information utilization among healthcare providers where routine data are generated.

8. Recommendations

8.1. Recommendations to Zone Health Department and Woreda Health Offices. Thorough HMIS training should be made available to help health workers understand and use the system more effectively.

8.2. Recommendations to Policies Maker. Efforts must be made to reduce complexity of RHIS for Health Professionals in the facilities by giving training on HMIS.

8.3. Recommendations to Health Facilities. Health facilities should motivate health professionals for accomplishing their targets and work performance timely to run and facilitate RHIS utilization.

8.4. Recommendations to Health Service Provider. The health professional should improve their skills of accomplishing their target.

Abbreviations

HIS: Health information system
 HMIS: Health Management Information System
 RHIS: Routine health information system.

Data Availability

The first author or the last author will provide the data gathered for this study upon reasonable request.

Additional Points

Limitation of the Study. The cross-sectional design of the study prevents it from demonstrating a cause-and-effect link between the dependent and independent variables.

Ethical Approval

With the protocol number IRB 051/2022, Asrat Woldeyes Health Science Campus, Debre Berhan University, granted ethical clearance.

Disclosure

A verbal informed consent form outlining the study's goals and participants' rights was given to every study participant. The questionnaires were securely handled after completion, and all access to the results was strictly controlled. Participants were all chosen at random without any bias.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

The authors designed the study, worked on creating the study proposal, collected the data, analyzed it, authored the initial draft of the publication, and took part in all stages of the project. Before submission, all authors reviewed and approved the manuscript's final version.

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