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Routine health information system utilization and associated factors among health professionals in public health facilities in Dire Dawa, eastern Ethiopia: A cross-sectional study

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Abstract

Background: Using reliable evidence from routine health information system (RHIS) over time is a vital aid to improve health outcome, tackling disparities, enhancing efficiency, and encouraging innovation. In Ethiopia, utilization of routine health data for improving the performance and quality of care was not well-studied in grassroot health facilities.

Objective: This study was conducted to determine the level of RHIS utilization and associated factors among health professionals in public health facilities of Dire Dawa, eastern Ethiopia.

Methods: An institution-based cross-sectional study was conducted among 378 health professionals from June 10 to July 20, 2020. Self-administered pretested-structured questionnaire was used to collect data from the participants. Data were entered using EpiData 3.1 and analyzed using Stata 16.0. Descriptive statistics was used to describe the basic characteristics of the participants, and multivariable logistic regression analysis was conducted to identify factors associated with RHIS utilization. Adjusted odds ratio (AOR) (95% CI) was used to report association and significance declared at a *P*-value <0.05.

Results: Good RHIS utilization among health professionals was 57.7% (95% CI: 52.6%, 62.6%). Good organizational support (AOR = 3.91, 95% CI: 2.01, 7.61), low perceived complexity of RHIS formats (AOR = 2.20, 95% CI: 1.23, 3.97), good self-efficacy (AOR = 2.52, 95% CI: 1.25, 5.10), and good decision-making autonomy (AOR = 3.97, 95% CI: 2.12, 7.43) were important factors associated with good RHIS utilization.

Conclusions: The level of good RHIS utilization among health professionals was low. Lack of self-confidence and empowerment, complexity of RHIS formats, and poor organizational support were significantly reducing RHIS utilization. Therefore, improving self-efficacy and decision-making capacity of health professionals through comprehensive training, empowerment, and organizational support would be essential.

Keywords

Determinants, Dire Dawa, Ethiopia, health professionals, routine health information system, RHIS utilization

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Introduction

The routine health information system (RHIS) is a set of data regularly collected to meet predictable information needs primarily containing statistics on health services, epidemiological, administrative, and financial data.[1,2] A well-functioning RHIS is essential to provide the information

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needed for health system management, governance, accountability, planning, policymaking, surveillance, performance monitoring and evaluation, and quality improvement.[3–5]

Globally, the first routine health information registers (data of births and deaths) started in London in the early 18th century (1800s)[6] and later in the 19th century (1990s), to promote development of routine health information in developing countries, emphasizing management of the health system.[7] In Ethiopian context, usually RHIS is equivalent to health management information system (HMIS),,[8–11] which has been implemented since 2008 to provide core health indicators used to improve the provision of healthcare services and health status of the populations and used as a major source of information for monitoring, evaluation, and adjusting policy implementation,[8,10–12]

However, the use of information for evidence-informed decision-making – particularly data produced by RHIS – is still very weak in most low- and middle-income countries including Ethiopia.[9,13–15] In these regions, utilization and effectiveness of RHIS in improving health system performance have been questioned due to multivariate factors/determinants.[5,9,13,15,16] Besides, the large amount of unreliable health data, poor human resources, poor information technology infrastructures, and poor utilization of the data for evidence-based decisions cumbersome the effectiveness of the system.[2,17] Consequentially, too often, data are sat in reports, shelves, cabinets, databases, and left unanalyzed to be sufficiently utilized for policy and program improvements.[18]

Health professionals are expected to play a pivotal role in RHIS data analysis, interpretation, and utilization for operational, tactical, and strategic decision-making purposes. Despite these, health professionals serving in public health facilities are often over-burdened by excessive reporting requirements from multiple and poorly coordinated subsystems that cannot deliver timely, accurate, and complete data.[19,20] Besides, health professionals were the main source of poor data quality in general and incompleteness and incorrectness mostly due to technical, behavioral/individual, and environmental/organizational factors of information use.[21,22] According to the studies conducted among health professionals in central and northern Ethiopia, lack of appropriate inputs to the system, lack of data management skill, lack of incentives, lack of feedback, lack of technical support, poor attitude of workers, lack of management commitment, centralized decision-making, and absence of information use culture were identified important factors for RHIS utilization.[23,24]

In response to the aforementioned challenges, the Ministry of Health of Ethiopia has undertaken extensive reforms and redesigns the national RHIS to respond to the deficiency of routine health data that limited the quality of care and decision-making by managers and stakeholders at all levels.[8,12]Most importantly, the ministry has set information revolution as one of the four major priority agenda aimed to enhance cultural transformation of health workers and digitalization of the RHIS.[8,12]

However, recent studies evidencing the current status of RHIS utilization is lacking.[3,13,17,25] Besides, majority of the previous studies is limited to organizational and managerial levels to assess the level of RHIS utilization.[3,13,17,24–28] Therefore, this study aimed to assess the level of RHIS utilization using objectively measured multivariate factors (technical, organizational, and behavioral factors) among health professionals in public health facilities of Dire Dawa Administration in eastern Ethiopia.

Methods

Study design and setting

An institution-based cross-sectional study was conducted in Dire Dawa Administration in eastern Ethiopia, from 10 June 2020 to 20 July 2020. Dire Dawa is located at 515 KM, East of Addis Ababa, Capital of Ethiopia. Based on the 2007 Central Statistical Agency population census, the total population of the Administration was projected to be 342, 827 in 2019. According to the Dire Dawa Administration Health Bureau annual report of 2019, there were two hospitals, 15 health centers, and 34 health posts with a total of 1080 health workers were providing the routine healthcare services for the catchment populations of Dire Dawa Adminstration.[29]

Population and sampling

All health professionals in public health facilities in Dire Dawa were the source population. Health professionals in randomly selected public health facilities in Dire Dawa were the study population. Critically sick health professionals and those who were on leave of any types or long-term training or education or other field-works during the data collection period were excluded from the study.

The sample size was calculated with Epi Info version 7.1 considering the assumptions for single (RHIS utilization) and double (for factors) population proportion formulas. Accordingly, the maximum sample size of 379 was obtained using a single population proportion formula considering 78.5% proportion of good RHIS utilization,[26] confidence level of 95%, margin of error of 5%, design effect of 2, non-response rate of 10%, and a total population of 1080.

We applied a two-stage stratified sampling technique to select the study participants. First, public health facilities were stratified into hospitals and health centers, and then, one out of two hospitals and six out of 15 health centers were randomly selected. Then, the sample size was proportionally allocated to each selected facility based on the actual numbers of registered health professionals serving in that selected health facility during the last 6 months

before the interview. We prepared a separate sampling frame for each facility using their actual numbers of (permanently) hired health professionals in 2020 and recruited participants using a simple random sampling technique.

Data collection tools and measurements

Pretested-structured questionnaire adapted from PRISM framework assessment tool version 3.1[2] and different relevant published literatures[5,9,10,17,23,26,28,30–33] were used to collect data from the study participants through a self-administered interview conducted over a month. The questionnaire contains information about sociodemographic characteristics of the study participants (sex, age, residence area, current marital status, educational level, religion, profession, working unit/position, being member of performance management team (PMT), working experience, and monthly salary in birrs), organizational factors (organizational support, training, training adequacy, supervision, and supervision quality), technical factors (technical support and perceived complexity of RHIS formats), behavioral factors (self-efficacy, attitude toward RHIS and decision-making autonomy), and RHIS utilization (Supplementary Table 1).

Before starting data analysis, internal consistencies of items were checked for each domain scale of dependent indices and independent variables using reliability analysis (Cronbach's α). Accordingly, we checked for the internal consistency of each domain of PRISM framework tool for assessing organizational, technical, and behavioral determinants of RHIS utilization and computed summary statistics, mean ± SD, minimum and maximum scores, and standard error. We observed high internal consistency across all domains with the minimum in attitude toward RHIS items (Cronbach's α=0.72) and the maximum in self-efficacy items (Cronbach's α=0.97) (Supplementary Table 2).

RHIS utilization

The use of information for improving effectiveness and efficiency of healthcare services through better management at all levels.[2] RHIS utilization was measured by 13 five-point Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from 13 items, and RHIS utilization was considered "good" when the participant scored above the mean and considered "poor" when scored the mean and below.[24,26,31]

***Organizational support*:** It was measured using 11 five-point Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from 11 items, and the level of organizational support was considered "good" when the participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,26]

***Training*:** It was considered "yes" when the participant received a short-term educations or orientation on RHIS or health management information system and its related reporting tools and procedures as per the national HMIS training manuals on how to use data elements, indicators, and their definitions in the last 2 years prior to interview and considered "no" unless otherwise.

***Training adequacy*:** It was measured using seven five-points Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from seven items, and the level of training adequacy was considered "good" when the participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,24,26]

***Supervision*:** It was considered "yes" when the participants had taken RHIS/health management information system-specific or related supportive supervision/follow-up aimed at enabling service providers to perform RHIS/HMIS properly through providing on-the-job trainings and/or technical supports in the last 6 months prior to interview and considered "no" unless otherwise.[2,5]

***Supervision quality*:** It measured using five dichotomous questions each coded "1" when the participant responded "right answer" and "0" when responded "the wrong answer" and then composite index score computed from five items, and the level of supervision quality was considered "good" when the participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,24]

***Technical support*:** It measured using seven five-points Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from seven items, and the level of technical support was considered "good" when the participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,24]

***Perceived complexity of RHIS formats*:** It was measured using four dichotomous (yes/no) questions each coded "1" when the participant responded "yes" (i.e., complex) and "0" when responded "no" (i.e., not complex) and then composite index score computed from four items, and the level of perceived complexity of RHIS formats was considered "not complex" when the participant scored "quartile 1 and below," considered "fairly complex" when scored between "quartile 1 and quartile 3" (exclusive of both), and considered "complex" when scored between "quartile 3 and above."[2,24]

***Self-efficacy*:** It was measured using seven 10-points Likert scale items each rated from "0" (no competency) to

"10" (best competency) and then composite index score computed from seven items, and the level of self-efficacy was considered "good" when the participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,24]

***Attitude toward RHIS*:** It was measured using six five-point Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from six items, and health professional's attitude was considered "good" when participant scored "quartile 3 and above," considered "fair" when between "quartile 3 and quartile 1" (exclusive of both), and "poor" when scored "quartile 1 and below."[2,17,26]

***Decision-making autonomy*:** It was measured using six five-points Likert scale items each rated from "1" (strongly disagree) to "5" (strongly agree) and then composite index score computed from six items, and the level of decision-making autonomy was considered "good" when participant scored "quartile 3 and above," considered "fair" when scored between "quartile 3 and quartile 1" (exclusive of both), and considered "poor" when scored "quartile 1 and below."[2,24,26,31]

Data quality control

To maintain the data quality, standard questionnaire adapted from validated instruments and relevant published literatures were contextualized to the study purpose and contexts. Six trained nurses collected the data, and two public health experts supervised the overall data collection process with investigators. We pretested a questionnaire on 19 health professionals (5% of total sample size) to check its validity and coherences in a non-selected health facility in Dire Dawa, eastern Ethiopia. EpiData was used for data entry to minimize the potential errors that could occur during entry. During data collection work, strict onsite supervision of data collectors and validation of collected data was carried out by supervisors and investigators.

Statistical analysis

After manually checking for completeness and consistency, data were entered using EpiData version 3.1 and then cleaned (checked for outliers and missing values, illogical errors), recoded and computed composite indices scores, and analyzed using Stata/SE 16.0 softwares. Descriptive statistics (frequency, measures of central tendency, and dispersion) were used to characterize the study participants accordingly. Bivariable and multivariable binary logistic regression analyses were conducted to identify factors associated with good RHIS utilization. Independent variables with a *P*-value of <0.25 during our bivariable analysis were considered in our multivariable analysis model. The overall model adequacy was confirmed using Hosmer and Lemeshow goodness of fit test at a *P*-value of >0.05. We ruled out and confirmed the absence of both numerical errors and multicollinearity problems in the model. Adjusted odds ratio (AOR) with a 95% CI was used to report the strength of association, and significance was declared at a *P*-value of <0.05.

Results

Characteristics of participants

A total of 378 (99.7%) health professionals participated in the study. Three 356 (94.2%) participants were urban residents, and half (50.8%) of the participants were female. Their mean age ± SD was 31.5 ± 6.6 years, and 263 (69.6%) of the participants were in the age group of 26–35 years. The majority (79.9%) of participants were Bachelor of Science degree holders, and a quarter (25.1%) was a member of the facility's PMT. The median work experience duration of the participants was 4 years with an interquartile range of 5 (Quartile1 = 2, Quartile3 = 8) (Table 1).

Organizational, technical, and behavioral factors

From a total of 378 health professionals, organizational support was good for 25.9% of the participants. Around a quarter (27.8) of the participants had received RHIS training in the last 6 months prior to an interview, and training adequacy was good for 28.6% of the trained participants. About 63.2% of the participants had received supervision in the last 6 months prior to interview from the higher-level bodies or institution(s), and supervision quality was good for 40.7% of the supervised participants. Nearly three out of 10 (29.4%) of the participants had good technical support. A quarter (25.1%) and one-third (29.9%) of the participants had good self-efficacy and good decision-making autonomy, respectively (Table 2).

RHIS utilization

This study identified that the level of good RHIS utilization was 57.7% (95% CI: 52.6%, 62.6%) among health professionals in public health facilities of Dire Dawa Administration, eastern Ethiopia

Factors associated with RHIS utilization

The bivariable analysis showed that sex, type of facility, being a PMT member, organizational support, supervision, technical support, perceived complexity of RHIS reporting formats, attitude toward RHIS, self-efficacy, and decision-making autonomy were significantly associated with good RHIS utilization at a *P*-value of <0.05. Predictors with a *P*-value of <0.25 in the bivariable analysis were included

Table 1. Sociodemographic characteristics of health professionals in public health facilities in Dire Dawa, eastern Ethiopia, 2020 ($n = 378$).

Characteristic	Frequency	Percent
Sex		
Female	192	50.8
Male	186	49.2
Age (in years)		
≤25	48	12.7
26–35	263	69.6
≥36	67	17.7
Current marital status		
Married	238	63.0
Unmarried*[a]	140	37.0
Highest education level		
Diploma/level	55	14.5
Bachelor of Science degree	302	79.9
Masters of Science degree	21	5.6
Religion		
Orthodox	220	58.2
Muslim	91	24.1
Protestant	56	14.8
Catholic	11	2.9
Profession		
Public health	37	9.8
Nurse	176	46.5
Midwifery	40	10.6
Laboratory	26	6.9
Pharmacy	31	8.2
Physician	39	10.3
Other*[b]	29	7.7
Type of health facility		
Health center	219	57.9
Hospital	159	42.1
Current working unit/ward		
ART	24	6.4
MCH	90	23.8
OPD	184	48.7
Pharmacy	28	7.4
Laboratory	25	6.6
Other*[c]	27	7.1
Member of PMT		
Yes	95	25.1
No	283	74.9
Working experience (in years)		
<5	217	57.4
5–10	127	33.6
>10	34	9.0
Monthly salary (in Ethiopian birrs)		
≤5087	94	24.9
5088–7999	175	46.3
≥8000	109	28.8

Note: RHIS = routine health information system, PMT = performance monitoring team, OPD = outpatient department, MCH = maternal and child health, ART = ante-retroviral therapy [a]Single/divorced/widowed. [b]Radiographer, social worker/counselor, and physiotherapist. [c]Radiology unit, eye clinic, counseling unit, and abortion.

in our multivariable analysis model. Accordingly, good (AOR = 3.91, 95% CI: 2.01, 7.61) and fair (AOR = 1.94, 95% CI: 1.14, 3.30) levels of organizational support, good self-efficacy (AOR = 2.52, 95% CI: 1.25, 5.10), and good decision-making autonomy (AOR = 3.97, 95% CI: 2.12, 7.43) among health professionals and perceived simplicity/non-complexicity of RHIS reporting formats

Table 2. Organizational, technical, and behavioral determinants of RHIS utilization among health professionals in public health facilities in Dire Dawa, eastern Ethiopia, 2020 ($n = 378$).

Characteristic	Frequency	Percent
Organizational factors		
Level of organization support		
Poor	122	32.3
Fair	158	41.8
Good	98	25.9
Training		
Yes	105	27.8
No	273	72.2
If yes, level of training adequacy ($n = 105$)		
Poor	30	28.6
Fair	45	42.8
Good	30	28.6
Supervision		
Yes	239	63.2
No	139	36.8
If yes, level of supervision quality ($n = 239$)		
Poor	11	4.6
Fair	74	31.0
Good	154	64.4
Technical factors		
Level of technical support		
Poor	123	32.5
Fair	144	38.1
Good	111	29.4
Perceived complexity of RHIS formats		
Not complex	147	38.9
Fairly complex	134	35.4
Complex	97	25.7
Behavioral factors		
Level of self-efficacy		
Poor	98	25.9
Fair	185	49.0
Good	95	25.1
Attitude toward RHIS		
Poor	136	36.0
Fair	131	34.7
Good	111	29.3
Level of decision-making autonomy		
Poor	175	46.3
Fair	90	23.8
Good	113	29.9

Note: RHIS = routine health information system.

(AOR = 2.20, 95% CI: 1.23, 3.97) were predictors associated with good RHIS utilization (Table 3).

Discussions

This study investigated the level of RHIS utilization and associated factors among health professional in public health facilities in Dire Dawa, eastern Ethiopia. We found that about half (57.7%) of health professionals had good RHIS utilization. The level of organizational support, the level of perceived complexity of RHIS reporting formats, level of self-efficacy, and the level of decision-making ability among health professionals were identified independent predictors of the level of RHIS utilization.

Accordingly, this study revealed that around one out of two (57.7%) health professionals had the good level of RHIS utilization which implies a substantial proportion of health professionals have the practice of good RHIS

Table 3. Factors associated with RHIS utilization among health professionals in public health facilities in Dire Dawa, eastern Ethiopia, 2020 ($n = 378$).

Characteristic	RHIS utilization		cOR (95% CI)	aOR (95% CI)
	Good, *n* (%)	Poor, *n* (%)		
Sex	_	_	_	_
Female	120 (62.5)	72 (37.5)	1.497 (0.99, 2.26)*	1.45 (0.91, 2.32)
Male	98 (52.7)	88 (45.3)	1.00	1.00
Profession				
Public Health	25 (67.6)	12 (32.4)	1.98 (0.78, 5.03)	1.11 (0.39, 3.58)
Nurse	107 (60.8)	69 (39.2)	1.47 (0.73, 2.96)	0.98 (0.41, 2.23)
Midwifery	24 (60.0)	16 (40.0)	1.43 (0.58, 3.48)	0.97 (0.33, 2.86)
Laboratory	12 (46.2)	14 (53.8)	0.81 (0.30, 2.20)	1.02 (0.33, 3.18)
Pharmacy	13 (41.9)	18 (58.1)	0.69 (0.27, 1.78)	0.43 (0.14, 1.35)
Other*[a]	17 (58.6)	12 (41.4)	1.35 (0.51, 3.60)	1.27 (0.41, 3.97)
Physician	20 (51.3)	19 (48.7)	1.00	1.00
Type of health facility				
Health center	139 (63.5)	80 (36.5)	1.76 (1.16, 2.67)**	1.14 (0.74, 1.85)
Hospital	79 (49.7)	80 (50.3)	1.00	1.00
Member of PMT				
Yes	66 (69.5)	29 (30.5)	1.96 (1.20, 3.22)**	1.01 (0.54, 1.83)
No	152 (53.7)	131 (46.3)	1.00	1.00
Level of organization support				
Poor	46 (37.7)	76 (62.3)	1.00	1.00
Fair	94 (59.5)	64 (40.5)	2.43 (1.50, 3.94)***	1.94 (1.14, 3.30)*
Good	78 (79.6)	20 (20.4)	6.44 (3.49, 11.89)***	3.91 (2.01, 7.61)***
Supervision	_	_	_	_
Yes	148 (61.9)	91 (38.1)	1.60 (1.05, 2.45)*	1.05 (0.52, 1.50)
No	70 (50.7)	69 (49.3)	1.00	1.00
Level of technical support				
Poor	54 (43.9)	69 (56.1)	1.00	1.00

(continued)

Table 3. Continued.

Characteristic	RHIS utilization		cOR (95% CI)	aOR (95% CI)
	Good, *n* (%)	Poor, *n* (%)		
Fair	85 (59.0)	59 (41.0)	1.84 (1.13, 2.99)*	1.36 (0.78, 2.38)
Good	79 (71.2)	32 (28.8)	3.16 (1.83, 5.43)***	0.84 (0.42,1.69)
Perceived complexity of RHIS formats				
Complex	41 (42.3)	56 (57.7)	1.00	1.00
Fairly complex	75 (56.0)	59 (44.0)	1.74 (1.02, 2.94)*	1.17 (0.64, 2.12)
Not complex	102 (69.4)	45 (30.6)	3.10 (1.82, 5.28)***	2.20 (1.23, 3.97)**
Level of self-efficacy				
Poor	37 (37.8)	61 (62.2)	1.00	1.00
Fair	108 (58.4)	77 (41.6)	2.31 (1.40, 3.82)**	1.56 (0.89, 2.74)
Good	73 (78.6)	22 (21.4)	5.47 (2.92, 10.25)***	2.52 (1.25, 5.10)*
Attitude toward RHIS				
Poor	61 (44.9)	75 (55.1)	1.00	1.00
Fair	73 (55.7)	58 (44.3)	1.55 (0.96, 2.51)	1.17 (0.65, 2.08)
Good	84 (75.7)	27 (24.3)	3.83 (2.21, 6.63)***	1.59 (0.81, 3.12)
Level of decision-making autonomy				
Poor	77 (44.0)	98 (56.0)	1.00	1.00
Fair	47 (52.2)	43 (47.8)	1.39 (0.84, 2.32)	1.03 (0.59, 1.82)
Good	94 (83.2)	19 (16.8)	6.30 (3.54,11.21)***	3.97 (2.12, 7.43)***

Notes: Significant at $P < 0.05$=*, at $P < 0.01$=**, $P < 0.001$=***; RHIS = routine health information system, PMT = performance monitoring team, *a = b = radiographer, social worker/counselor, and physiotherapist.

utilization. This finding is higher than the studies conducted in Harar, eastern Ethiopia (30.6%);[34] Jimma, southwest Ethiopia (32.9%);[33] and Gojjam, northern Ethiopia (45.8%).[31] In addition, it is higher than study conducted in eastern Ethiopia (54.4%)[22] and the national studies conducted in Ethiopia (48%)[35] and Cote d'Ivoire (38%).[18] However, this finding was lower than the study conducted in North Gondar, northwest Ethiopia (78.5%).[26] The possible explanations for the higher level of good RHIS utilization in this study might be due to the better level of organizational support, non-complexicity of RHIS reporting formats and the better level of self-confidence and decision-making autonomies of health professionals seen in the present study. Furthermore, the recent government initiatives and strategies give a special emphasis to boost the level of RHIS utilization for evidence-based decision-making purposes, and improvement of health professionals' culture of information use might be other possible explanations for the observed difference.[16]

Moreover, few previous studies were done in the settings where there were no full structure and assigned personnel on RHIS/HMIS program (in health post and health centers) that might decreased the level of RHIS utilization,[33,36,37] while other previous studies with good RHIS utilization might be due to the methodology variation (inclusion criteria) used to select the study participants.

For instance, in Gondar study, participants were the most influential PMT members of health facilities like the HMIS/HIS officers/HIT professionals, facilities head, and departments/case team leaders.[26]

In this study, the better level of organization support was significantly increased with the good level of RHIS utilization. RHIS utilization was four-fold higher among health professionals who had good level and fair level of organizational support from the higher/above bodies/institutions compared to those who had poor level of organizational support. This finding was somewhat similar with studies conducted in western Amhara region and East Gojjam Zone, northwest Ethiopia, that showed organizational factors such as access to training, supervision, and logistics (computer, HMIS formats, and guideline) were significant predictors of good RHIS utilization.[31,36]

In addition, this finding was supported by study conducted in northern Ethiopia that indicated good culture of information use, supervision, governance, planning, and feedback increased the level of RHIS utilization.[26] Moreover, this could be due to the presence of program-specific regular supportive supervision and feedback provision system seen in our study setting, and recently, the government special emphasis to RHIS utilization for evidence-based decision-making and improvement of health professionals' culture of information use might raise the level of organizational support and RHIS utilization.[16]

According to the WHO measure evaluation, self-efficacy is one of determinants of RHIS utilization.[38] Health professionals' self-efficacy came from knowledge and understanding about HMIS that in turn lead to good RHIS utilization for decision-making. In this study, good self-efficacy was a statistically significant predictor of good RHIS utilization. RHIS utilization was around three-fold higher among health professionals who had good level of self-efficacy compared to those who had poor level of self-efficacy. This finding was similar to the study conducted in Hadiya Zone, southern Ethiopia; RHIS utilization was three-fold higher among health workers who had the good level of self-efficacy enough to perform RHIS/HMIS activities compared to their counterpart.[28] The finding was also supported by another study conducted in southern Ethiopia; health information data quality was higher for health workers having good level of self-efficacy enough to perform HMIS activities compared to their counterpart.[9,32] Moreover, this was supported by studies done in Ethiopia and Uganda; health workers who were confident enough to perform HMIS activities were more likely to use routine health information than their counterpart.[9,28,39]

Besides the possible explanation, the RHIS utilization was influenced by competence of the people to perform HMIS tasks, and in this study, there were a higher confidence level for computing trends, using data for identifying gaps and setting targets, using data for various types of decisions, and providing feedback, whereas the lower competence level was observed in explaining the trend obtained from data, explaining findings, and culture of information use. These show unawareness of a gap between their perceived and actual competence in performing a task. In this study, RHIS utilization was three-fold higher when health professionals had good decision-making power, and this finding was similar with studies conducted in western[24] and eastern Ethiopia.[17]

As the strength, this study attempted to show the level and determinants of RHIS utilization among health professionals. In addition, the study utilized standardized and validated instrument, a PRISM framework version 3.1 tool for data collection. Besides, the study can be generalized to public health facilities in urban and rural settings. However, the study was not free from limitations such as inability to include qualitative method to explore health professionals' culture of information use and other organizational factors. Besides, the cross-sectional study design might have prevented the work from showing temporal relationship. Moreover, the study was not able to include health professionals in private institutions.

Conclusions

This study concluded that about half of health professionals in public health facilities in Dire Dawa had practice of the good RHIS utilization. In this study, the level of organizational support, the perceived complexity of RHIS formats, the level of self-efficacy, and decision-making autonomy were found to be significant predictors of the good RHIS utilization. Therefore, provision of comprehensive health information system training, strengthening organization support, and empowering decision-making capacity of healthcare providers in public health facilities would be essential. Furthermore, further research is suggested for assessing health workers' culture of health information use at the lower health facilities where data are generated.

Abbreviations

AOR	adjusted odds ratio
HMIS	health management information system
PMT	performance monitoring team
PRISM	performance of routine information system management
RHIS	routine health information system
WHO	World Health Organization

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