

Assessment of Behavioral and Organizational Determinants of HMIS Performance in Beghi, District West Wollega, Oromia, Ethiopia

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Abstract

Introduction: Best performed Health Management Information System (HMIS) is most frequently cited as critical for evidence-based decision making and effective targeting of interventions to those in greatest need at each level of health system. The aim of this study was to determine behavioral and organizational determinants of HMIS performance in Beghi, District West Wollega, Oromia, Ethiopia **Methodology:** A facility based cross-sectional descriptive study design was used for the assessment of HMIS Performance determinants in a context of its behavioral and organizational categories to formulate, take possible actions and review Post interventions.

Result: The result of the study showed that an organizational determinants of HMIS performance within Begi District were poor management support, lack of effective supportive supervision and feedback provision focusing on HMIS data quality and information use practice. The Competency in HMIS task was shown that 73% of respondents were able to calculate percentage and plot the given data by months/years diligently, of which, 86% were unable to interpret the findings and use the information for identifying gaps and setting targets. Confidence levels of health professionals for HMIS tasks Before intervention have been identified that on average, confidence levels of respondents (health staffs) for calculating percentage or rates correctly, plotting data by months or years, explain findings or trends and use of HMIS data for identifying gaps, setting targets and making decisions were about 80%, while average confidence levels (self-efficacy level) of health staffs for checking HMIS data quality were 60%. **Conclusion:** This study determined organizational and behavioral determinants of HMIS performance in the study area, which were: poor management support, lack of effective supportive supervision and feedback provision focusing on HMIS data quality and information use practice and only 14% were able to interpret the findings and use the information for identifying gaps and setting targets respectively. Therefore, health planners and policy maker would be better to give great emphasis to strength addressing organizational and behavioral determinants of HMIS performance in developing countries for better quality of health care system implementation.

Keywords: Behavioral and organizational determinants of HMIS performance.

Background

An organization becomes effective and efficient by bringing and managing resources together in productive way. The traditional lists of resource comprise human, financial and material resources. Only since past few decades that information becomes other resources believed to be an indispensable for effective management (1). Since 1987, world health organization (WHO) reports clearly links improved health management to better performed health management information systems: Of the major obstacles to effective health management, information support is the one most frequently cited. For information to influence health management in an optimal way, it has to be used by decision-makers at each point of the management spiral including situational analysis, priority setting, implementing and evaluating programmed activities (2).

Strong health management information systems have been identified as critical for addressing health challenges and improving health service delivery at all levels of health system. However, the quality of the data produced by such systems is often poor and the data are not used effectively for decision-making in developing countries. Although there has been increasing international attention given to the need of developing strong health management information systems, it has proved difficult to do so for several reasons (3).

Now days due attention has been given for improving performance of health services delivery and its management information system which is widely seen to be attributed to better performed HMIS process at each level of health system. Despite the potential of HMIS process in supporting strategic planning, efficient allocation of scarce resources and effective targeting of intervention to those in greatest need leading to better health outcome, countries with the highest burden of illness and with the urgent needs for proper generation and use of evidence have the weakest HMIS process and performance in the vast majority of world's poorest

countries (4). Therefore, this project was designed to determine the current status of HMIS performance in the study area.

PRISM conceptual framework: PRISM broadens the analysis of routine health management information system performance to include three key categories of determinants that affect it:

Behavioral determinants – the knowledge, skills, attitudes, values, and motivation of the people who collect and use data;

Technical determinants – data collection forms, processes, systems, and methods; and

Organizational determinants – information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system (5).

The PRISM toolset

The PRISM toolset includes the following data collection tools and instructions on their usage: Performance of HMIS Diagnostic Tool: This tool captures the technical determinants of RHIS performance, such as level of complexity of data collection forms and user - friendliness of information technology and determines the overall level of RHIS performance, i.e. the level of data quality and use of information.

Overview and Facility/Office Checklist: This tool also examines technical determinants of RHIS and it allows understanding the availability and status of RHIS resources necessary for RHIS implementation at the facility and district levels.

Organizational and Behavioral Assessment Tool (OBAT): This tool identifies behavioral factors include level of data demand, motivation, confidence, task competence, and problem - solving skills and organizational factors include level of promotion of a culture of information, and the existence (or not) of a reward system which affect RHIS performance (5).

PRISM Tools Package

The PRISM Tools Package is a set of routine HMIS performance assessment tools that are developed from the PRISM conceptual framework. When used as a whole, the package will provide a comprehensive picture of routine HMIS performance and its contributing factors in the technical, organizational, and behavioral areas. Results will allow users to develop multidimensional interventions to improve HMIS performance (5).

Methods and Materials

Study setting

The project was carried out at Beghi District in West Wollaga zone between Januarys to June/2015. West Wollaga zone is found 445 kilometers from Addis Ababa. The total population of Beghi District is estimated to be 149,459. The climate of the District is woina dega and farming is the predominant source of livelihood. Beghi District has 1 functional governmental primary Hospital and 5 Health centers and 42 community Health posts.

Study Design

A facility based cross- sectional descriptive study design was used to highlight the routine HMIS performance in terms of improved data quality and continuous use of information. In addition, the technical, behavioral and organizational determinants of HMIS performance were assessed to generate and implement possible interventions. Post interventions review was conducted to assess changes in a view of making recommendations.

Operational Definitions

Behavioral determinants – refers to the knowledge, skills, attitudes, values, and motivation of the people who collect and use data that affect HMIS performance (5);

Organizational determinants – information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system (5);

Technical determinants – data collection forms, processes, systems, and method (5)

Study Population

All of 106 health professionals including the health facility managers and people working on HMIS in Beghi District were included in the project study. In addition, registered data and facility's reports were assessed using adopted PRISM toolset to check HMIS data quality and information use.

Survey Methodology

Beghi District has 5 Health centers. Each health center is comprised of its own satellite health posts connected to each other by a referral system based on geographical proximity. In accord with this division, the District HMIS performance assessment was conducted at all the five Health centers (HC) and the Woreda Health Office (WorHO). Those Health centers were: Beghi HC, Gunfi HC, Kobor HC, Shombo HC, and Tulu HC which comprises 15, 12, 5, 5 and 5 satellite health posts respectively. According to the PRISM conceptual framework, the District routine HMIS performance can easily be assessed by randomly selecting its 19 health facilities, if its total health facilities are 30 or more (5). According to this framework, 14 health facilities are needed in addition to 5 health centers in order to include 19 health facilities of the districts. Thus, 14 health posts were randomly

selected from sampling frame of 42 health posts in the Beghi District. In order to proportionate the satellite health posts selection under each Health center, proportionate allocation sampling was used. That is by the formula:

$$ni = \frac{n}{N} * Ni$$

, Where; N is all of the 42 health posts in the District, n is the 14 health posts to be included, Ni is the number of satellite health posts under the respective Health center and ni is the proportional satellite health posts to be selected from the respective Health center. All of the health professionals in the selected health facility were included in the study.

Data Collection Instrument

Self-administered questionnaires adopted from organizational and behavioral assessment tool of PRISM toolset were used to provide baseline of behavioral and organizational factors affecting routine HMIS performance. HMIS performance diagnostic tool was adopted from PRISM toolset in order to capture technical determinants of routine HMIS performance that is level of complexity of data collection forms and its user - friendliness as well as to provide a baseline of routine HMIS performance such as the level of data quality and use of information in Beghi District. In addition, facility checklist was adopted in order to list the availability and status of routine HMIS resource necessary for routine HMIS implementation at facility level. Management Assessment Tool (MAT) was adopted to take rapid stock of the routine HMIS management practices and developing possible intervention for better management.

Data Quality Issues

The questionnaires were adopted from PRISM Framework, Measure Evaluation and WHO guidelines. The adoption of questions from these guidelines and framework was based on the definition given to HMIS and its components by South African development community (6). The questionnaires were adopted in English. Pre-testing of the questionnaires was conducted in the Beghi District using randomly selected twenty individuals to assess clarity, understandability, and flow of questions as well as the time needed to fill the questionnaires. Based on the findings some questions were restructured.

Ethical Consideration

The project work was conducted after the approval of the project by the ethical clearance committee from Addis Ababa University and after a formal ethical clearance was obtained. Before conducting the survey, written permission was obtained from the Oromia Regional health Bureau and West Wollaga Zonal Health Department and Beghi woreda health office. The data collection consent was obtained from the Beghi woreda health office. All the project participants were briefed on the purpose and benefits of the project and the consent was obtained in advance from each participant.

At the same time, data collectors told the respondents the ethical prerequisites for the questionnaires, where and how the writer is going to present the results. The data collectors clearly expressed the emphasis given to bring up the rules to maintain the respondent's anonymity. After explaining the ethical issues and get an informed consent from the respondent, the data collectors collected the data in the suitable area that can avoid an interruption. In this manner the questionnaires were filled.

RESULTS AND DISCUSSION

The findings of this study were *baseline HMIS data for behavioral and organizational determinants* before intervention in Begi District. Then the implemented interventional activities aimed to improve HMIS performance. Finally the achieved improvement on *HMIS organizational determinants and HMIS performance* and its determinants before interventions in view of making recommendation.

Determinants of HMIS Performance

As asserted by the PRISM conceptual framework, determinants of HMIS performance were measured in context of its technical, behavioral and organizational determinants (5).

Technical determinants of HMIS performance

Technical determinants of HMIS performance are often make confusion with the behavioral determinants, particularly with staffs' knowledge and skills for accomplishing routine HMIS tasks. However, technical determinants of HMIS performance can be clarified as factors that need special know - how and its absence affects confidence levels and motivation of health staffs in accomplishing Routine HMIS tasks (5). On other hand, it is a factor related to the specialized know-how to manage and improve routine HMIS processes that affect HMIS performance both directly and through behavioral factors. It also looks at availability and user friendliness of data collection forms and procedures (7).

The technical determinants of HMIS performance both at Health facilities and Woreda Health Offices level were assessed during pre-intervention assessment of this study by discussing with Performance Monitoring Teams (PMT); and where PMT is not established, with health facilities management teams on the issue of user friendliness and comprehensiveness of HMIS tools like registries, reporting forms, HMIS manuals as well as on

difficulty of analyzing, using and transferring HMIS information to HMIS Unit then to District Health office as well as to Zonal health Department (ZHD).

The result showed that HMIS tools were comprehensive and user friendly. However, facilities' PMT or management teams agreed that there was gap related to know-how of managing and improving HMIS processes that affect routine HMIS performance.

Behavioral determinants of HMIS performance

If health professionals have better understanding on importance of HMIS tasks and have high self-efficacy (confidence), better problem solving skills and competency in doing HMIS task, then they would complete a given HMIS tasks perfectly (6).The behavioral factors were assessed by the pre intervention assessment were level of confidence for HMIS tasks, HMIS task competency and problem solving skills as well as knowledge of health professionals on the rationale of including particular information during data collection.

Confidence Level in HMIS tasks

Confidence levels of health professionals for HMIS tasks were assessed by scale rated from 20% to 100% that means less confidence to high confidence in accomplishing a particular HMIS task. The findings of pre-intervention assessment of this project showed that average confidence levels of respondents (health staffs) for calculating percentage or rates correctly, plotting data by months or years, explain findings or trends and use of HMIS data for identifying gaps, setting targets and making decisions were about 80%, but average confidence levels (self-efficacy level) of health staffs for checking HMIS data quality were about 60%. This illustrate that respondents felt more confident in calculating, plotting, and using of HMIS data than checking HMIS data quality.

Competency in HMIS tasks

Competency in HMIS task was measured through making respondents solving problems given on a paper test at pre intervention assessment stage of the project. The result showed that on average, about seventy three percent (73%) of respondents were able to calculate percentage and plot the given data by months/years diligently. However, about eighty six percent (86%) of respondents were unable to interpret the findings and use the information for identifying gaps and setting targets. These findings indicate that data are most commonly collected for reporting purposes than for local action oriented performance monitoring to improve performance and remove obstacle. As it is obviously expected, the result indicated that as one go down from Woreda Health Office to health center and from health center to health posts competency levels of health staffs in HMIS task decreases. The result also showed that health professionals' skill for analyzing and interpreting HMIS data as well as their knowledge on rationale of data collection and on method of checking data quality was slightly lower although they had relatively higher confidence level for the HMIS tasks.

Organizational Determinants

Dimensions of organizational determinants affecting HMIS performance assessed during pre-intervention assessment of this project were Supervision Quality, promotion of information culture and HMIS resources availability as key contributors of HMIS performance at district and facility level.

Supervision Quality

The findings of pre-intervention assessment of the study showed that supportive supervisions aimed at improving routine HMIS performance, particularly to produce better quality data and continuous information use were insufficient and sporadic both at health center and health post level. About 79% of health posts and 100% of health centers had received supervisory visits during the last three months. Those health posts and health centers which received supervisory visits reported that HMIS data quality and information use was not investigated during the supportive supervisory visits. Another dimension of supportive supervision quality that was assessed was action-oriented feedback provided after supervisory visit as to motivate health professionals to improve and/or maintain HMIS data quality and information use. Of the supervised health facilities 100% of the health centers and 64% health posts received feedback from supervisors during past 3 months but not on HMIS data quality and information use.

Promotion of a Culture of Information

During pre-intervention assessment of this project, the promotion of culture of information was assessed by looking at different activities of the Begi woreda health office such as giving directives on how to use HMIS information as well as on establishment and functionality of Performance Monitoring Team at all health facilities. The results showed that no directives were given on use of HMIS information from District to facilities during past three months. The results also indicated that HIT at Health Centers did not attend performance review meetings at the woreda health office level for discussing health service performance although such performance review meetings provide an opportunity which could foster interest of using HMIS information and leading to improved HMIS performance.

In terms of establishing Performance Monitoring Teams at health facilities, only two of the health centers among five health centers have PMTs and out of them one health center was maintaining the meeting minute of past three months. In one health center that was maintaining the meeting minute, HMIS information was not

discussed in the last three months and had no evidence of making decisions using HMIS data.

Availability of HMIS Resources

The pre-intervention assessment of this project looked at the availability of resources necessary for better HMIS performance such as calculator at health post, computer, printer, electricity and internet connection. Among 14 health posts surveyed none of them even have calculators. Among five health centers surveyed only two of them have even one computer. Out of those two health centers only one health center has printer. A telephone line is there only at one health center. Both woreda health office and health facilities haven't internet connection. At District level, Woreda Health Office have three computers and two printers. These resources can be considered as contributing factors for ensuring better HMIS performance. For instance, the low score of HEWs' ability (competency of HEWs in HMIS task) to calculate percentage of basic indicators data and high data inaccuracy can be the effect of an absence of calculators at the health posts level. It is equally important to deal that electric power supply is necessary for better HMIS performance. Among five Health centers surveyed only two HCs have access to electric power supply through the regular supply.

Interventions and strategy

Strategy: Establishing HMIS Performance Improvement Team

This was crucial for success of the project because culture of information that is ensured by promoting values and beliefs for collection, aggregation, transmission, analysis and use of health information for evidence based decision making is an element of organizational culture and can be strengthened if all staffs at each level of health system are involved. Therefore, involved members in HMIS performance improvement team include vice head of Begi Woreda Health Office, process owner of each program and HMIS focal person at all levels. Establishment of the team was aimed at initiating higher management of Begi Woreda Health Office and making them active participant of this project.

Interventions

Interventions made by the project for improving HMIS data quality and information use practice in case of Begi District comprise discussion and preparing action plan for the interventional activities with management team of the Woreda Health Office, on-job training, supportive supervision, data audit as well as performance review meeting.

HMIS data analysis

The pre intervention assessment of this project identified that HMIS data analysis at health facility level particularly at health center was conducted only in terms of generating monthly summary report for woreda health office. More or less this project by its interventional activities enables all health centers of Begi woreda to conduct data analysis in terms of carrying out comparison of HMIS data over quarter, Comparison among service coverage by types and Comparison among facility's catchment areas. In addition, particular gap identified on Comparison of service coverage by types and with zone target at the woreda health office level before intervention was addressed after intervention.

Organizational Determinants

Supervision quality

As identified by pre-intervention assessment, out of health facilities received supervisory visits in none of them HMIS data quality check was carried out. Thus, supervisory check list particularly on HMIS data quality check and information use practice was developed with involvement of HMIS performance improvement team established by this project and integrated it in to regular supervisory visits. This was aimed to pave the way for providing action-oriented feedback on HMIS data quality and information use by higher level to lower level administrative units.

Promotion of information culture

In terms of promoting culture of information, this project ensured Performance Review Teams to be established at all Health centers which was only at two health centers of the woreda before intervention as to give directive on HMIS information use in preparing local action plan, sharing best practice of information use and provide feedback.

In terms of establishing Performance Monitoring Teams, this project ensured Performance Monitoring teams to be established at all Health centers which was only at two health centers of the woreda before interventions and increase awareness of keeping the meetings minutes for further reference to follow up the meetings decisions and give feedback on its implementation.

In view of the fact that since culture of information use is a subset of organizational culture, it can be strengthened if all people within an organization are participated and that is why HMIS performance Improvement Team was established as main strategy of interventional activities of this project. It was assumed that culture of information use affect staff's self-efficacy level for HMIS tasks. As other part of interventional activities of this project, data audit and performance review meeting was conducted with active participation of HMIS performance Improvement Team. In such away evidence based decision making was promoted, staffs were motivated by recognizing their better performance. This in turn increased the confidence and responsibility

of the staffs for their future continuous work toward ensuring and sustaining HMIS data quality and information use practice to locally monitor performance of service delivery.

Behavioral determinants of HMIS performance which include health professionals' confidence for HMIS task, competence in HMIS task, Knowledge on rationale of HMIS data collection and method of data quality check were assessed during pre-intervention assessment. The result showed that respondents felt less confident in checking HMIS data quality than calculating, plotting, and using of HMIS data. The result also showed that although they had relatively higher confidence level for the HMIS tasks except checking HMIS data quality, health professionals' skill for analyzing, interpreting and using HMIS data as well as their knowledge on rationale of data collection and on method of checking data quality was found to be lower. These gaps were beyond this project due to budget and time limitation as well as limitation of project manager experience. Thus, requires further integrated improvement interventions.

Conclusion

This was due to Poor commitment from woreda management for better quality HMIS data and local continuous information use, lack of due attention given to knowledge and skills for HMIS data processing, analyzing, interpretation and use, and poor supportive supervision for improving HMIS performance as some contributing factors for poor performance of HMIS in Begi District.

During improvement intervention of this study, specific on-job training on concept, definition and purpose of HIS, HMIS and CHIS in the context of local performance improvement, and sustaining a culture of information use was given. Supportive supervisory visits, data audit and performance review meeting were carried out with active participation of HMIS performance improvement team and an encouraging result was achieved on HMIS performance. Although it requires further research for formal costing analysis, these interventional activities are likely to be a relatively inexpensive way of improving HMIS data quality and information use in resource-poor settings.

RECOMMENDATION

Promoting a culture of information through giving directives on how to use HMIS information as well as providing feedback based on HMIS information.

West Wollaga zonal Health Department and all stakeholders should work together in order to conduct further assessment on HMIS data quality and information use practice within the zone.

Begi woreda and concerned bodies should give well organized on the job training on HMIS performance and its determinants.

Further research for analyzing cost and effectiveness of similar interventions as well as to see association between better performed HMIS process and improved performance of health service delivery.

Therefore, health planners and policy maker would be better to give great emphasis to strength addressing organizational and behavioral determinants of HMIS performance in developing countries for better quality of health care system implementation.

Competing interests

The author(s) declare that they have no competing interests.

Authors' contributions

Fikru Negese Dufera, Workshet Lamenu, Dereje Bayissa Demissie & Amarech Guda conceptualized the study, designed the study instrument and conducted the data analysis and wrote the first draft and final draft of the manuscript.

Workshet Lamenu: Approved the research proposal with some revisions, participated in data analysis, revised subsequent drafts of the paper and involve in critical review of the manuscript. All authors read and approved the final manuscript.

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