

Barriers and Facilitators of Implementing Performance-Based Non-Financial Incentives to Improve Data Quality and Use: Using a Consolidated Framework for Implementation Research

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Abstract

Background: Evidence shows that recognizing the best performers in organizations can motivate workers to make other remarkable achievements. However, there was scant information regarding the barriers and facilitators of implementing performance-based non-financial incentives (PBNI) to improve health data quality and information use by district health workers in northwest Ethiopia.

Aim: The main objective of this research was to analyze the factors that hinder or support the successful implementation of the Performance-Based Non-Financial Incentives (PBNI) system in order to enhance the quality of data and its utilization among district health workers in northwest Ethiopia.

Methods: The research conducted in the Wogera district of Northwest Ethiopia utilized a phenomenological qualitative approach. In order to collect data, a record of qualitative information was compiled, focusing on the obstacles and aids to the implementation of PBNI (Performance-Based Non-Financial Incentives) for improved data quality and usage. These insights were derived from discussions held during performance review meetings and health data-days throughout the implementation phase. Additionally, qualitative data was obtained through interviews with 13 individuals purposefully selected for their knowledge and experience in the subject matter. Subsequently, the interviews and information log were transcribed, translated into English, and subjected to coding, organization, and thematic analysis using the Consolidated Framework for Implementation Research domains with the assistance of Open code-4.03 software.

Results: Factors explored as facilitators of PBNI implementation include the presence of positive pressure to implement PBNI, the availability of networked communication, the social architecture of facilities, and the presence of self-motivation and competitive spirit. On the other hand, the barriers included the wrong perception of PBNI that the participants had at the beginning of the implementation process, the presence of different prioritized agendas, the absence of a platform and guideline to acknowledge and motivate best-performing individuals, the need to appraise the performance of individuals, case-teams, and health facilities to identify and reward them accordingly, and the subsequent cost associated with the appraisal process.

Conclusion: The need to appraise the performance of implementers to identify those who deserve the incentives, the cost associated with the appraisal process, and the staff's concern about the fairness and reliability of the performance evaluation process were a few challenges encountered. However, the data-day platform and the governments' interest in improving health data quality and information use are opportunities that future implementers can capitalize on. [*Ethiop. J. Health Dev.* 2023;37 (SI-1)]

Keywords: Performance-based, non-financial incentive, implementation research, Ethiopia

Introduction

Well-organized and enhanced health information systems are fundamental in measuring and improving the quality and coverage of health services. Reliable and timely health information is crucial for operational and strategic decision-making that saves lives and improves health (1). The Ethiopian healthcare system has been implementing a health management information system at all levels of healthcare delivery to improve the quality of data and information use (2). However, the healthcare data quality and use remain weak and challenged by multiple factors from inside and outside the health systems (1-3). Relying on the current trend may not be promising in addressing challenges as it might prolong the problem (2, 4).

Therefore, interventions are necessary to address the existing problems related to data quality and information use.

In 2019, a team at the University of Gondar, in collaboration with partners from the Data Use Partnership (DUP), Ministry of Health (MOH), Regional Health Bureau (RHB), and Woreda Health Office (WHO), designed a performance-based non-financial incentive (PBNI) intervention to enhance the healthcare data quality and information use at the lower level of the healthcare system. To achieve the goal of the intervention, different interlinked PBNI components as a package that focuses on recognizing change agents (better-performing health professionals)

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working in different departments of health centers in the Wogera district were considered. Some of the components of the intervention package include a television, desktop computer, flash-disk/hard disk, power bank, certificate, and assurance letter of scholarship.

Different Studies and theories have indicated the positive effect of incentivizing health workers on improving health outcomes. For instance, a study in the US indicated that performance-based incentives significantly improved patient care experiences (5). Moreover, a quasi-experimental study in Ghana showed that performance-based incentives significantly motivated nurses and midwives to better routine activities (6). However, it is not clear what the determinants are and how they influence the implementation process of PBNI to improve health data quality and information use. Therefore, this study assessed barriers and facilitators of performance-based non-financial incentive intervention to improve data quality and information use by employing the consolidated framework for implementation research in Wogera district of Northwest Ethiopia.

Methods

Study design and period

A phenomenological qualitative study design was employed to explore the barriers and facilitators of PBNI in producing quality health data and its utilization from the lived experience of health workers in Wogera district. The study was conducted from the first of October 2021 to the end of November 2021.

Study settings

The study of barriers and facilitators of implementing PBNI to improve data quality and information use was conducted in Wogera district, located in northwest Ethiopia. The district constitutes 51 Kebeles and has a total population of 278,942. . One primary hospital, eight health centers, and 44 health posts in the district provide preventive, promotive, and curative health services. 108 Health Extension Workers (HEWs), 678 Health Workers (HWs), and 215 supportive staff have been working in these facilities.

Study participants and sampling procedure

Because this is implementation research, any information related to the barriers and facilitators of implementing PBNI, obtained in the early and middle stages of the implementation process, is useful to facilitate the implementation process. Thus, the study was based on information obtained from Wogera district health system as far as the information is directly linked to the implementation barriers and facilitators of applying PBNI to improve data quality and information use. The acquisition of such qualitative information was started just before and at the implementation of PBNI and continued until formal qualitative data was collected at the end of the implementation period, which lasted for six months. Specifically, information obtained during the discussions held in three data-days and three review meetings was used to identify the barriers and

facilitators of implementing PBNI and how they influence the implementation process. In addition, complementary information was obtained through formal and informal discussions with health workers and facility heads during field visits. Some of these were also conducted just before the initiation of the implementation research to develop a proposal suggesting provisional implementation strategies that would be refined further during the implementation process. Therefore, the study participants include attendees of the review meetings and data-days and staff of district health offices and health centers (HCs).

In the summative study that was conducted after the PBNI implementation, the qualitative interviewees were recruited from the health centers, focal persons and officers from the district health office, and the district health office head. Thus, in the summative qualitative study, the purposive sampling technique was used to identify the interviewees based on their experience and the level of engagement and role they had since the start of the PBNI implementation. We approached the interviewees and informed them about the study's aim and identified their rich experience on PBNI. Considering the information obtained from review meetings, data-day discussions, and field visits during the implementation period, information saturation was reached after 13 in-depth interviewees during the summative qualitative data collection period.

Data collection methods and procedures

As mentioned earlier, the information or data were collected from sources that had some connections with the PBNI implementation process, and the research team could acquire lessons from it so that appropriate implementation strategies could be devised to overcome the barriers and capitalize on the facilitators. Therefore, the barriers and facilitators and the mechanism of how they influence the implementation effectiveness were investigated through evaluative discussions in the review meetings and data days, as well as in-depth interviews with purposively selected study participants. During the review meetings and data days, health workers were evaluated their performance, which usually involves critics. The situation usually leads them into hot discussions, and health workers would try to justify their poor performance, if any, by explaining the challenges they faced and how they tried to overcome them. Furthermore this is mainly related to their lived experience with the barriers and facilitators of implementing PBNI to improve data quality and use. Therefore, the research team prepared a log of information about the barriers and facilitators of the implementation process in a continuum manner during the whole implementation period.

In addition, a qualitative interview was conducted at the end of the implementation period in the local language (Amharic). In this interview, the data collectors were master's degree holders who had ample experience in qualitative data collection and research. They were trained for a half day in the data collection using an interview guide. An open-ended interview

guideline was prepared and used during the summative assessment to facilitate the data collection process. It was developed by reviewing literature focusing on barriers and facilitators of data quality and information use in the context of PBNI and also from experts' experiences. Accordingly, these questions were framed

as per the Consolidated Framework for Implementation Research (CFIR) components; outer settings, inner settings, individual characteristics, and process of the implementation to characterize the intervention (7) (Figure1).

| Consolidated Framework for Implementation Research (CFIR) | | | | |
|--|---|---|--|--|
| Intervention characteristics | Outer setting | Inner settings | Individual characteristics | Process |
| <ul style="list-style-type: none"> • Source of PBNI • Relative advantage of using PBNI • PBNI's adaptability • PBNI's complexity | <ul style="list-style-type: none"> • Health facility needs and resources • Cosmopolitanism • Peer pressure • External policy and incentives | <ul style="list-style-type: none"> • Structural characteristic of health system • Networks & communications • Culture of district health system • Implementation climate • Tension for change • Relative priority • Organizational incentive rewards • Goals and feedbacks • Leadership engagement • Available resources • Access to knowledge and information | <ul style="list-style-type: none"> • Knowledge and belief about PBNI • Self-efficacy • Individual stage of change | <ul style="list-style-type: none"> • Planning PBNI • Engagement • Execution |

Figure 1: The CFIR framework containing the five domains that affect the implementation of PBNI.

Generally, the questions in the interview guide were prepared in such a way that they would encourage the study participants to discuss the barriers and facilitators of implementing PBNI for better data quality and information use. To ensure the confidentiality of information obtained and the quality of data, the interviews were conducted at places where the respondents could feel comfortable and encouraged to give their lived experiences freely. All interviews were tape-recorded, and the in-depth interviews ranged from 33 minutes to 64 minutes.

Data quality assurance

To ensure the trustworthiness of the study, multiple techniques were employed. To enhance the study's credibility, members of health centers who had direct connections with the production and use of quality health data were recruited to participate in the research and to provide their experiences in data quality and use. The data collectors chose suitable places to conduct the interviews where participants would be encouraged to respond freely. In addition, efforts such as providing the purpose of the study were made to maintain participants' trust in its significance so that open, complete, and truthful responses could be obtained. The research conducted close and supportive supervision. The research team conducted Close and supportive supervision at the time of the survey to ensure the quality of the data collected. The use of well-experienced qualitative data collectors and proper probing were also the other techniques for ensuring the

credibility of the findings. Moreover, direct quotations/voice insertions were also provided. There was also prolonged engagement (for about a year) with the data that helped us understand and carefully.

To maintain its transferability, a detailed description of the context of the study settings and participants was provided. To maintain the study's dependability, all procedures, findings, and decisions made were documented. Furthermore, the qualitative data were shared with colleagues to get peer feedback and check the conformability (neutrality) of the analysis and its interpretations.

Data processing and analysis

The qualitative data analysis started parallel to the data collection process as successive probing questions were asked based on the participants' responses. Verbatim transcription and translation to English were performed. The translations were coded, and thematic analysis was performed based on the components of the CFIR framework using the Open Code software version 4.03. The codes and emerging themes were grouped and summarized under the themes or components of the CFIR framework. To help readers better understand the barriers and facilitators experienced, and how they would affect the data quality and use, the emerged themes were supported with some direct (verbatim) quotations.

Ethics approval and consent to participate

Ethical clearance was obtained from the Review Board of the University of Gondar. Permission to conduct the implementation research was obtained from the Dissect Health Office, and informed consent was taken from each study participant. All data were collected based on codes instead of mentioning the respondents' names to avoid indicating any personal characteristics. The data were secured in the Ethiopian Ministry of Health and the University of Gondar repository and prevented any access to unauthorized persons.

Results

Description of the study participants

The study utilized information obtained from three review meetings three data days, and the qualitative data collected using in-depth interviews at the end of the implementation period or during the summative

assessment. In all these events or data collection processes, the focus was getting the lived experiences of study participants related to the barriers and facilitators of implementing PBNI to improve data quality and use.

In the summative qualitative study, there were a total of 13 key informants (a woreda health office head, five health centers' heads, four HMIS focal persons, a woreda planning officer, an EPI focal person, and a TB focal person) were interviewed, which lasted for a minimum interviews duration of 33 minutes and the maximum of 1 hour and 4 minutes to explore barriers and facilitators of PBNI on data quality and information use. The participants' work experience ranged from four to twenty years (Table 1).

Table 1: Study participants in exploring the barriers and facilitator of PBNI on data quality and information use in Wogera district, northwest Ethiopia, 2021 (n=13)

| Participants' description | Response(s) | Frequency (n) | Percentage (%) |
|---|-----------------------------|---------------|----------------|
| Sex | Male | 10 | 76.9 |
| | Female | 3 | 23.1 |
| Age | 25-30 | 9 | 69.2 |
| | 31-35 | 3 | 23.1 |
| | 36+ | 1 | 7.7 |
| Educational status | Diploma | 7 | 53.8 |
| | Bachelor degree | 5 | 38.5 |
| | Master's degree and above | 1 | 7.7 |
| Role/current position in their organization | Health center head | 5 | 38.5 |
| | District health office head | 1 | 7.7 |
| | Focal person* | 2 | 15.4 |
| | Officer* | 5 | 38.5 |
| Work experience (in years) | <=5 | 2 | 15.4 |
| | 5-10 | 9 | 69.2 |
| | 10+ | 2 | 15.4 |

*Focal person: Tuberculosis (TB) and Expanded Program of Immunization (EPI) focal

*Officer: Health Management Information System (HMIS), planning, Maternal and Child Health (MCH) officers

Barriers and facilitators of PBNI for data quality and information use

Because this is implementation research, the barriers/facilitators obtained during implementation would be resolved/capitalized on through designing appropriate implementation strategies; however, there could be, for example, other barriers that still prevail despite the attempts to overcome the initial problems. Therefore, considering the analysis of all these series of determinants, five main themes of barriers and

facilitators emerged. These themes are, of course, related to the five domains of the CFIR framework: the intervention characteristics, outer settings, inner settings, individual characteristics, and implementation process characteristics. Therefore, the factors and the mechanism of how they influence the effectiveness of PBNI are presented below under each theme.

Theme 1: Intervention characteristics

The sub-themes that emerged under the intervention characteristics were the source of intervention, relative advantage, adaptability, and complexity. Intervention characteristics were generally perceived as facilitators of the performance-based non-financial incentive intervention.

Intervention source

One of the worries that the health workers raised during the first review meeting were related to the fairness or impartiality of staff performance evaluation or treating all potential awardees equally. This was of course related to the fact that the intervention was simply incentive or rewarding. This concern was related to their prior experience, such as unfair treatment of departments, health facilities, or individuals. The concern was raised in connection to its negative consequences unless appropriately implemented. In this context, the concern was considered minimal because the intervention was sourced outside of the health facilities. Supporting this idea, a respondent reported that, *"The performance-based non-financial incentive was developed by the university in collaboration with Woreda and the regional health bureau which minimizes the validity concern of evaluation."* [focal person, 13 years' experience].

Relative advantage

Another concern was the motivating power of financial incentives over non-financial ones. This is because financial incentives might not last very long or be sustained. This may be persuasive because money can be used for daily consumption without leaving any trace of the incentive. As a result, the motivation due to the stimulus or reward may not stay longer, leading the implementers to change the intervention into a non-financial incentive.

The finding also showed that the PBNI added value to their efforts on routine facility-based activities to improve data quality and information use compared to the usual approach. Participants explained this as *"... Performance-based non-financial incentive is important. It made us compete to each other. Many staff are adjusting their routine activities after the start of awarding as per performance, and our performance is improving..."* [HMIS officer, 6 years' experience].

Participants also explained from their short-lived experiences that PBNI is a low-cost intervention approach that should be encouraged and scaled up in other health facilities to improve data quality and information use.

Adaptability

In this subtheme, participants were asked how they explained the degree to which PBNI could be tailored, refined, or reinvented to meet the issue of data quality and information use. Many participants agreed that PBNI can be adapted in rural health facilities and at different administrative levels and thus can be more effective for the performance of case teams, individuals, and facilities. Supporting this idea, an officer explained that, *"... we humans usually like to be acknowledged in front of others regardless of the*

amount of the value of the reward. This intervention (i.e., PBNI) confirmed that it is doable by ourselves even if the support from the University of Gondar ceases." [Planning officer, 7 years' experience].

Complexity

The most essential complexity of the intervention is that incentive would be offered if and only if a potential candidate scored highest compared to others. Thus, unlike the other types of intervention, this particular type of intervention (incentive) needs performance evaluation of individuals, case teams, and HCs to intervene with the incentive. This would entail extra costs or resources and even may risk implementers when there is a security concern, as our study setting had.

Participants forwarded that if the selection process distorted, the intervention's effect would be dangerous. Supporting this idea, a respondent justified as *"... if the best-performing person is not identified for the incentive, it can lead to grievances among the health workers, and selection should be curious, and each point should be addressed before recognition."* [HMIS officer, 6 years' experience].

Theme 2: Outer settings

Implementers recognized the University of Gondar as a facilitator since they might not have improved data quality and information use unless they received continuous mentoring, coaching, and support from it. The University had influenced the data quality and information use achievement in the district, and there was observed behavioral change towards health data generation and use by providing various initiatives. A respondent justified this by saying *"The University of Gondar has taken the lead and been implementing and supporting our woreda with different initiatives including data quality and information use"* [Focal person 13 years' experience].

Facility needs

Data quality and information use issues were accurately known and prioritized by the district and facilities. Accordingly, it was found that facilities have better needs for PBNI intervention for data quality and information use that can be used to realize their prioritized agenda. One of the participants responded as *"Data quality and information use are the prioritized agenda in health facilities. We have always been discussing issues of data quality"* [HMIS officer, 6 years' experience].

Cosmopolitanism

The finding indicated that the district plays a role in collaborative activities and is linked with other stakeholders in improving data quality and use. This collaboration and linkage facilitated PBNI intervention since the implementers perceived that collaborative work with other institutes helped them ensure community health in the district. A respondent justified this as *"The district health office was good in creating a network with the external organizations. Most of the time, the district health office was preparing proposals for external organizations and trying to have a fund*

from the network." [Head, 20 years' experience]. On the other hand, the permanent or temporary cutoff of electricity and internet networks were the challenges that negatively affected the implementation effectiveness, and these problems required working closely with the respective service providers, which otherwise required executing tasks manually.

Competitive pressure

In general, the competitive pressure and other prioritized agendas are considered barriers to PBNI intervention. Many participants presented that there were different urgent issues like community-based health insurance, family health and others influencing their daily tasks. An EPI focal person with 6 years of experience said, "When incident tasks such as polio vaccination are introduced, the regular task will be forgotten. Because we shift from the regular task to the incident task."

Theme 3: Inner settings

The inner conditions affecting performance-based non-financial incentives was explored, and a range of subthemes, including structural characteristics of the intervention, networks and communication, culture, implementation climate, tension for change, relative priority organizational incentives and rewards, goals, and feedback, and leadership engagement have emerged.

Structural characteristics

The intervention's main structural characteristics were the social architecture, age, maturity, and size of an organization in the intervention district. Morning session discussion and staff availability were considered facilitators of the intervention. In addition, the availability of an existing culture of data quality maintaining platforms in the facilities could simplify the intervention. The presence of a performance monitoring team and regular reviewing of reports helped to attain the intervention objectives. A 6 years' experienced EPI focal person narrated this idea as; "We carry out a regular performance monitoring team (PMT) meeting, which helped us to maintain data quality." The findings indicated that females were more concerned with producing quality health data. A respondent justified as: "Considering the sex of the individuals, females are good in data quality. Males are concerned with doing activities, but they don't register and tally the activities." [Focal person, 6 years' experience].

Networks and communications

Participants were asked how the organization worked collaboratively within it in the context of information sharing. Accordingly, the findings showed that the availability of formal and informal communication had influenced the intervention as a facilitator. One of the participants said: "We have formally announced PBNI to our staff on the notice board, and also, we have discussed it with the health center senior management team, so everybody and the department are aware, and the process is transparent." [HMIS officer, 6 years' experience].

In some facilities, individuals use their phones to exchange messages as narrated by a 6 years' experienced HMIS officer response; "Always we communicate using different platforms like telegram, personal phone so that we follow these platforms to implement the intervention".

Culture

The culture, values, and basic assumptions of implementing PBNI at the Woreda health office, health facilities, departments, and individual levels were explored in this subtheme. Accordingly, the existing culture of the facilities towards data quality and information use was becoming a facilitator during PBNI implementation. Respondents explained that they perceived healthcare data is vital to provide quality service and a newly emerged intervention can motivate them as supported by the views of a 5 years experienced facility head: "Our PMT believes the information is power even before PBNI implementation and now PBNI implementation motivates us to improve data quality and use than the previous ones".

Already existing health facilities' data quality monitoring and follow-up mechanisms, such as performance monitoring teams, regular feedback, and monthly report review, have been positively influencing the PBNI on data quality and information use. Thus, attention given to data quality and information use at health systems was considered an opportunity.

Implementation of climate and tension for change

The participants were briefed about the absorptive capacity for change and the shared receptivity of involved individuals, case teams and facility for PBNI. The findings showed that after implementing the PBNI package. There was good progress in developing an action plan for low performed indicators, and the direction set by the intervention assisted them in designing the strategy to improve their performance. The finding also indicated that the intervention helped them to check the quality of health data in the monthly report before they sent it to the next level. The intervention also influenced the participants to create a telegram group, which facilitated the exchange of information about data quality and information use across all departments and professionals.

Since its launch, the HCs, case-teams, and health workers have been inspired by the presence of the intervention. Supporting this idea, a respondent justified: "The data quality and information issues are currently our priority area. ... Consistently, we always do a lot of quality assurance sampling— a data quality assurance technique. All case teams compile and submit their reports timely...." [Officer, 6 years' experience]

Organizational incentives and rewards

The district health office has some experience of offering organizational incentives that are both financial and non-financial to health workers as per their performance. This practice facilitated the implementation of PBNI. A respondent justified this

trend by saying *"During the annual work evaluation, to motivate the best performer health professionals, we offered them 200 birr or 100-birr mobile cards. We are planning to get a budget to incentivize more in the next budget year."* [Head, 20 years' experience].

Leadership engagement

Leadership engagement, available resources, and access to knowledge and information perspectives were explored to assess the PBNI implementation readiness. Participants forwarded that there was a shortage of human resources, less supportive supervision, a shortage of budget, weak monitoring and evaluation system, which were a challenge to sustain the program. A participant explains Poor leaders' engagement during intervention: *"The repeated change of leadership and the lack of commitment of professionals were the major challenges. There was no transfer of tasks as officials rotated regularly, which was a great challenge for us."* [Planning officer, 7 years' experience].

Theme 4: Individuals' characteristics

Knowledge and beliefs about the intervention

In this section, knowledge and beliefs about the intervention were assessed to explore attitudes towards genuine evaluation of facility performance, case team, and individuals and incentivizing process. At the beginning, some of the health staff did not accept the intervention because it was for the first time that type of strategy was planned and implemented, but through time, after making the idea clear on how and why it would be implemented, they accepted the intervention. After some individuals were awarded, all were interested in the PBNI initiative, were working hard to be recognized. One of the respondents said: *"When we introduced PBNI, while they thought it was important, they did not accept it even senior management team asked about the significance. However, after implementing it in the first round, everybody accepted it and worked to be recognized."* [Head, 5 years' experience].

The non-financial incentives created a positive attitude among professionals who were never recognized for their excellent performance. One participant confirmed this idea: *"For instance, a midwifery nurse working at a health center has been protesting because she is working alone and overloaded. However, after recognizing her good performance, she stopped asking questions and was motivated to another award."* [Head, 20 years' experience]. Staff turnover was also one of the challenges of the implementation research, and as a result, the workload of actively working staff would increase, which was another challenge.

Theme 5: The Process

The last theme of the study includes barriers and facilitators that were raised in the process of planning, engagement, executing, reflecting, and evaluating and are presented as follows.

Planning

Participants were asked to explain whether they timely develop a plan to implement PBNI. After implementing the PBNI, the intervention district showed commitment to continue recognizing the best performers. One of the participants assured this idea, saying *"We have developed and implemented plans for implementing the information revolution. In this regard, we strive to improve the quality of information by making the incentive to a better-performing institution"* [P12, HMIS officer, 4 years of experience]. Moreover, Interviewees suggested a separate budget allocation in healthcare system allocation to motivate healthcare providers for their best achievement in healthcare service provision, quality data generation, and use. One participant justified this idea by saying, *"Incentive system needs a budget to initiate in a better tone. It is better to institutionalize the incentive program ..."* P13, health center head, 7 years of experience].

Engagement

Leaders need to be motivated and willing to do the work first so that others will follow them. This study found that the poor engagement of a few leaders acted as a barrier to facilitating PBNI. A respondent justified this context, saying *"The repeated change of leadership and the lack of commitment of professionals were major challenges. There was no transfer of tasks as officials rotated regularly in this regard. This was a great challenge for us."* [P12, HMIS officer, 4 years of experience].

Executing

Initially, there were some complaints by some case teams and individuals about the way awarded individuals were selected because of the information gap. However, this was resolved after thorough discussion and conveying information transparently and clearly. The discussions were carried out in meetings that were also platforms to acknowledge and recognize the best performers; at the same time, the platforms were employed to disseminate useful information and directive measures to implementers. After the research team clearly and explicitly explained in detail in the data-day ceremony how the performance of HCs, departments, and individuals was evaluated, an attendee reflected on his feelings, saying, *"... now I am satisfied with the fairness and credibility of the evaluation method you followed to evaluate us. My mind was different till this moment. It is now changed...."*" [Head, 5years' experience].

Another concern encountered by the research team during the evaluation process was the variations in the number of indicators to evaluate the performance of individuals or case teams. In this regard, some case teams and the respective staff may not have enough tasks related to health data generation and use. Thus, the number of indicators with which they would be evaluated is minimal. This situation affects the comparison process with other individuals to whom health data generation is their routine activity, and thus have many indicators to measure their performance.

Reflecting and evaluating

Finally, the regular monitoring and evaluation process of participants' performance during the intervention was explored. Accordingly, respondents explained that regular feedback mechanisms established in the intervention woreda have positively influenced the intervention. Confirming this idea, a participant said *"We provide feedback to professionals with better and lower performance. We also provide feedback to those who have done poorly to address the problem..." [P12, HMIS officer, 4 years of experience].*

The qualitative assessment of the barriers and facilitators of performance-based non-financial incentives on data qualitative and information use showed that the factors can be grouped into five components of the CFIR framework. These components include factors related to the intervention, individuals, inner setting, outer setting, and the implementation process.

Discussion

The study explored the barriers and facilitators of PBNI implemented to improve health data quality and information use in Northwest Ethiopia using the CFIR framework. Several barriers and facilitators at each of the five domains of the CFIR framework were identified: from the intervention characteristics, the concern of health workers on the fairness of evaluators to incentivize them, and the fact that PBNI needs the evaluation of the performance of potential awardees were identified; from the implementation process, a reliability concern on the method of performance evaluation by the judges was recognized and on the other hand, while the recognition/incentives motivate staff most when offered publicly and officially using the data day platform, in turn, the gatherings create the opportunity to address messages. From the inner settings, potential implementers do not get information and updates about the intervention equally, which may distort the competition, while period-review meetings were the opportunities to serve as a platform to transmit useful and directive messages and evaluations to each other concerning their performance in data quality generation; from individuals characteristics, few staff members were not vigilant or were irresponsible in addition to some staff turnovers.

The intervention, which was developed outside the organization, had influenced the work motivation of health professionals since they perceived the PBNI package was developed in collaboration with stakeholders, researchers, and implementers (8). One of the challenges related to the intervention is that, unlike most interventions/exposures, it needs the evaluation of performance to identify the individual, case team, or the health facility that would be exposed to the intervention. In addition to raising concerns about the fairness of the evaluation process, the evaluation process would incur extra costs that would limit its scalability in other settings unless an efficient and effective method is employed. Accordingly, the research team used the qualitative (global) and

quantitative approaches mentioned in the methods section, which helped to cut the cost and other resources needed in the implementation research.

The staff's concerns about the fairness of evaluators in incentivizing potential awardees might be due to what they experienced in their office. To avoid this concern, they should trust in the evaluators and evaluation process so that the competing parties can execute their health data-related activities freely to their capacity. Other evidence also showed that staff does their work as much as possible if they feel that they are treated fairly and equally (9). There were also similar concerns about the credibility of the evaluation methods, which were alleviated by incorporating their comments and some improvements iteratively in a tailored manner during the implementation process. In the current implementation research, however, this has been met through transparent communication about the evaluation methods publicly in the data days and then showing their performance evaluation results. The initiation and regular support from partners and the UoG research and implementation team towards quality health data generation and use have created a positive influence in improving individuals, case team, and facilities performance that was in line with the information revolution agenda of the country (10), and other authors also got similar findings (11-13).

Taking advantage of the data day to acknowledge the best performers in data quality generation and use, the events addressed directive measures and constructive evaluations among staff. When the staff accepted public and transparent appraisal of performance the staff accepted public and transparent appraisal of performance, the return would be significant (14, 15), which was, of course, the case in the current implementation research. At the same time, the transparent and healthy or constructive evaluation of staff performance helped the implementers to overcome the challenge of poor performance and deliberate underperformance by some individuals, which was also reported by others (4, 16-18). In addition, the event of data-day was useful for getting all in a hall which is an opportunity to disseminate the same information about the implementation at the same time to all implementers, which is another challenge distorting the competition if all parties do not get information at the same time.

Conclusion

The need to appraise the performance of implementers to identify those who deserve the incentives, the cost associated with the appraisal process, and the staff's concern about the fairness and reliability of the performance evaluation process were a few challenges encountered. However, the data-day platform and the governments' interest in improving health data quality and information use are opportunities that future implementers can capitalize on to overcome the identified barriers or challenges.

Conflict of interest

The authors declared no financial and non-financial conflict of interest.

Contributions

BT, LD, TH, AA, and BF conceived and designed the study.

AM, MM, MA, and TG contributed significantly to the writing of the manuscript.

Availability of data and materials

Data will be available upon request from the corresponding author.

Consent for publication

Not applicable

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Abbreviations

CBHI: Community Based Health Insurance, EPI: Expanded Program of Immunization, HIT: Health Information System, HMIS: Health Management Information System, PBNI: Performance Based Non-Financial Incentive, PMT: Performance Review Meeting, UoG: University of Gondar, GFIR: Consolidated Framework for Implementation Research, HCs: Health Centers, LQAS: lot quality assurance sampling.

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