Research Article

Evaluation of health information system In Iraq

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Abstract

Background: Health information systems in most countries are inadequate in providing the needed management support and the current health information systems are therefore widely seen as management obstacles rather than as tools, the current study is an attempt to assess the behavioral and organizational determinants of Health information system performance in Iraq.

Methods: A cross-sectional study was conducted with a total of 189 respondents selected from six Iraqi governorates were interviewed. The Organizational and Behavioral Assessment Tool was used to measure the behavioral and organizational determinant of Health information system performance, it is one of the PRISM package tools that are used to assess the Health information system performance.

Results: The overall mean confidence for Health information system tasks was 69.41%, while for tasks competence, it was 37.1% and that of motivation level was 43.4%. The total score of promoting a culture of information was 63.96% with department provide reward for a good work revealed a total percent of 56.83%.

Conclusion: It can be concluded that overall mean confidence for Health information system tasks is generally high compared to a low competency level for Health information system tasks, with a negative motivation feeling among respondents.

Keywords: Health information system, behavioral determinant

INTRODUCTION

Health information system (HIS) is defined as integrated efforts to 'collect, process, report and use health information and knowledge to influence policy making, program action and research (1).

Although it is understood that improvement of the situation requires "accurate information", many developing countries do not have reliable health management information systems (2), many describe it as highly unreliable and disorganized (3). In addition to that health information systems in most countries are inadequate in providing the needed management support (4, 5).

Current health information systems are therefore widely seen as management obstacles rather than as tools. The reasons can be due to irrelevance of the information gathered (6), Poor quality of data (7, 8), Duplication and waste among parallel health information systems (9), Lack of timely reporting and feedback (10), Poor use of information (11, 12), Lack of HIS policy framework and its application to plans, projects and actions (13), Relative HIS weak structure and limited resources (14).

Quality and timely data from health information systems are the foundation of the health system and it is considered as a core building block of the health system as a whole (15, 16), as within the health sector, choices made in the collection and use of information will determine the system effectiveness in detecting health problems, defining priorities, and allocating resources to improve health outcome (17). The World Health Organization (WHO) has long identified health information systems as critical for achieving health for all by the year 2000 (18), as the 1978 Declaration of Alma Ata (19) provided an opportunity to develop HIS to reflect broader development needs with an emphasis on intersectoral harmonization of the information systems.

So the decision for investing in National HIS are justified on a basis of the needs for information to support decision-making and action in the health sector, the feasibility and the cost benefit of the implementation (20).

The primary goal of the HIS is to support evidence based decision and action in the health sector (21). It is essential and practical step here is to know the

organizational and behavioral determinants of the HIS performance in the country and to compare them to other countries, this has been done by using practical tool which is the OBAT tool (Organizational and Behavioral Assessment Tool) which is one of the PRISM package tools produced by Measure Evaluation that are used to assess the HIS performance (22).

So the aim of this study is to assess the behavioral and organizational determinants affecting HIS performance in Iraq.

PATIENTS AND METHODS

A cross-sectional study was conducted for the assessment process, a total of 189 respondents selected from six Iraqi governorates were interviewed, and these governorates (Baghdad, Diyala, Saladin, Karabala, Sulaimania, and Theqar) were selected randomly. One hundred and forty one respondents were from facilities, 18 respondents were from districts and 30 respondents were from directorates. All of the respondents were involved in health information system activities. Either they were the person in charge of the facility, HIS focal person (Statistic unit in charge) or director or head of divisions of these departments.

The OBAT tool was used to measure the behavioral and organizational determinant of HIS performance; it is one of the PRISM package tools produced by measure evaluation together with John Snow, Inc., that are used to assess the HIS performance. The OBAT assesses perceptions about the organization through a rating scale The scale is about assessing the intensity of beliefs and ranges from "strongly disagree" (1), to "strongly agree" (5).

Behavioral Determinants

Self-efficacy or Confidence Level for HIS Tasks, are assessed on scale of 0 to 100 from no confidence to full confidence in performing a particular HIS task. The self-efficacy or confidence percentile scores for HIS tasks are calculated for checking data quality, calculation, plotting the given data, interpretation and information use.

HIS Task Competence: Task competence was measured by asking the respondent to solve a problem in a pencil-paper test (draw a chart or calculate rate).

RESULT

Behavioral Determinants

Self-efficacy or Confidence Level for HIS Tasks

The results in figure 1 of the data on confidence level, showed that the overall mean confidence for HIS tasks was 69.41%, the average confidence level for checking data quality, calculation and data plotting was between 66.77% and 74.6% , being data interpretation the lowest with 64.55%. In general respondents also believed that performing HIS tasks bring about negative outcomes, (average motivation level was 43.4%).

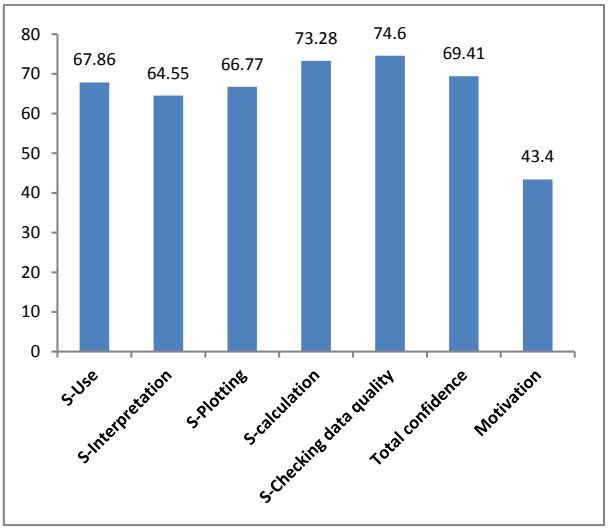

Figure 1. Mean comparison among perceived confidence level for HIS tasks

HIS Task Competence

The overall mean±SD competence level of HIS tasks is 37.1%±7%. When individual tasks were reviewed then it showed that respondents on average completed only 35%, 21% and 18% of the data quality check, interpretation and use of information tasks respectively, while on average 62.43% and 48.15% tasks were accomplished related to calculation and plotting the given data Fig (2).

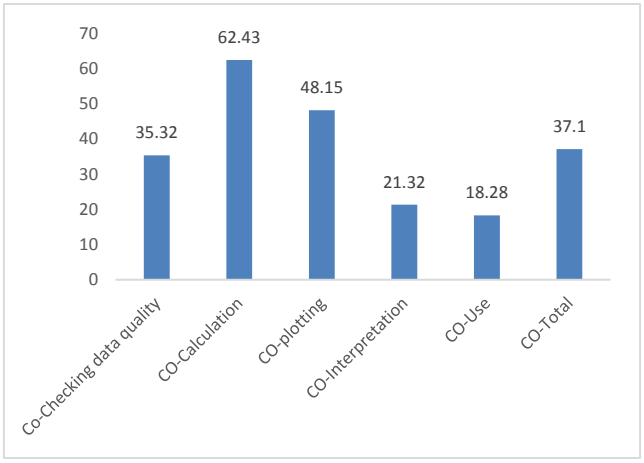

Figure 2. Mean comparisons among observed HIS task competence

Fig (3) shows that there is a gap among perceived and observed tasks when comparing average confidence level of HIS tasks with average level of HIS tasks competence.

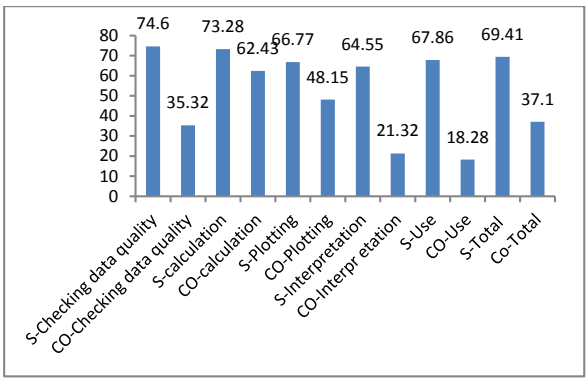

Figure 3. Mean comparisons among perceived confidence and observed HIS task competence

Organizational Determinants

Perceived Promotion of a Culture of Information

The PRISM framework assesses a culture of information by determining how strongly people believe that the health department promotes values like:

1) Emphasis on data quality.

2) Use of HIS information .

3) Evidence based decision making .

4) Problem solving .

5) Feedback from staff and community.

6) Sense of responsibility.

7) Empowerment and Accountability.

The results revealed a total score of promoting a culture of information was 63.96% and being 40.99%, 59.6%, 65.5% , 68.99% , 69.79%, 70.19%, and 72.66%, for Evidence based decision making, Feedback, Empowerment, Sense of responsibility, Problem solving, Use of HIS information and Emphasis on data quality respectively as shown in Fig (4).

Department provide reward for the staff for a good work revealed a total percent of 56.83%.

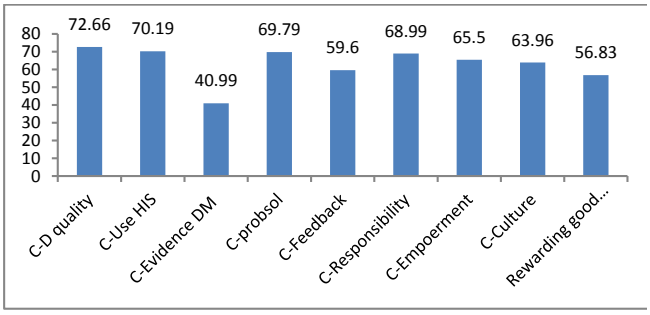

Figure 4. Mean comparisons among different dimensions of culture of information (N=189)

Comparing perceived promotion of data quality, use of information, and problem solving and observed HIS task competence showed that there is a gap among them, Fig (5).

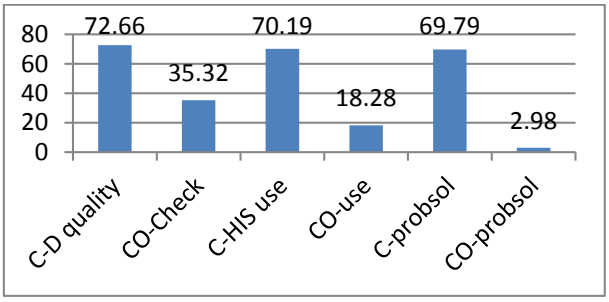

Figure 5. Mean comparisons among promotion of culture of information and HIS task competence (N=189)

DISCUSSION

Behavioral Determinants

The PRISM framework hypothesizes that behavioral factors are important determinants of HIS performance. HIS users' demand, confidence, motivation and competence to perform HIS tasks affect HIS processes and performance directly [24]. Understanding why some information/data is collected illustrates the level of data demand for HIS information. Problem solving is another skill that is necessary to using data for identifying and solving the problem [25].

The results showed that overall mean confidence for HIS tasks is 69.41%; it is lowest for interpretation (64.55%) and highest for checking data quality (74.6%), while confidence for other tasks lies in between lowest and highest confidence level. It indicates that respondents feel less confident in interpreting data and using information, while more confident in checking data quality.

The overall mean competence level of HIS tasks is 37.1% indicating that the respondents were able to accomplish about one third of the given HIS tasks, being the highest for calculating indicators and lowest for information use and data interpretation, indicating that they were not proficiently enough in those tasks.

High confidence level for HIS tasks is supposed to be associated with high level of HIS task competence. Comparing average confidence level of HIS tasks with average level of HIS tasks competence showed that there is a gaps found between confidence and competence levels. However, there were important gaps found between confidence and competence levels for checking data quality, plotting, interpretation, and use of information, indicating that respondents perceived high confidence in checking data quality, plotting, interpretation and use of information but could not perform in practice. The reasons for this discord could be explained that there is limited training on data

interpretation and use of information, which does not allow respondents to self-assess their perceived confidence level, and their actual data interpretation and use skills properly, creating the gap.

HIS task competencies in terms of checking data quality, analysis and use of information are limited in most countries. The following figure shows a gap between self-perceived capacity and real competencies to carry out the functions of the HIS among HIS staff at health facility level[26].

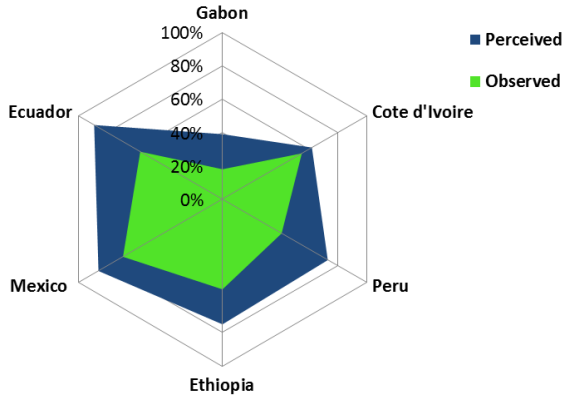

Figure 6. Self-perceived capacity and real competencies among HIS staff in different developing countries.

Promotion of a Culture of Information: The assessment results showed that respondents on average (mean±SD=63.69%±12%) strongly believed that health department promoting a culture of information i.e. emphasizes data quality, promotes use of HIS information, problem solving, feedback, sense of responsibility and empowerment. The only exception was for the indicator "evidence-based decision making" where average perception dropped to 40.99%, this indicator may be lower than the rest as a result of political interference and/or superiors' directives which could affect evidence-based decision-making.

The PRISM framework assumes that if organizations promote a strong culture of information they will also improve their competence levels in conducting HIS tasks, and thus improving their self-confidence to carry out HIS tasks[27].

On average respondents believe strongly that department promotes data quality, use of HIS information and problem solving which means it might also found a high level of HIS competence in that areas. A comparative analyses showed that it is not the case and in practice the respondents' perceptions did not match observed competence levels for checking data quality, use of information and problem solving, and the analysis showed that there are still gaps from 37 to 67 percentile points between perceived promotion of data quality, use of information, and problem solving and observed HIS task competence.

There are many possible reasons for this gap. First, the respondents might have exaggerated perceptions of the promotion of an information culture by the health department. Second, they might be unaware of the existing situation or tried to paint a better picture of the department than the reality. On the other hand, competence is measured objectively through a pencil-paper test thus reducing the possibility of over estimation. There is a need to improve this gap to improve HIS performance further.

It can be concluded that overall mean confidence for HIS tasks is generally high compared to a low competency level for HIS tasks. Perceived promotion of a culture of information were generally high which did not match observed

REFERENCES

1. 1.World Health Organization . The World Health Report 2003 -Shaping the Future. WHO; Geneva (2003).
2. Ranasinghe I, Sahama T , Yaralagadda P. Evidence based healthcare planning in developing countries: An Informatics perspective(2009).
3. WHO. Strengthening of Health Information Systems in countries of the South-East Asia region(2001).
4. WHO. Report of the Interregional Meeting on Strengthening District Health Systems, Based on Primary Health Care, Harare, Zimbabwe 3–7 August. Geneva, World Health Organization(1987) (cited in Sauerborn R and Lippeveld T 'Introduction' in Design and Implementation of Health Information Systems. WHO: Geneva. (2000).
5. Lippeveld TJ, Foltz A , Mahouri YM. Transforming health facility-based reporting systems into management information systems: lessons from the Chad experience. Cambridge, MA, Harvard Institute of International Development: 1–27 (Development Discussion Papers, No. 430) (1992).
6. WHO. Information support for new public health action at the district level. Report of a WHO Expert Committee. Geneva, World Health Organization: 1–31 (WHO Technical Report Series, No. 845) (1994).
7. Mavimbe JC, Braa J , Bjune G. Assessing immunization data quality from routine reports in Mozambique. [Research Support, Non-U.S. Gov't]. BMC Public Health, 2005;5: 108. doi: 10.1186/1471-2458-5-108.
8. Mutemwa RI . HMIS and decision making in Zambia; Rethinking information solutions for district health management in decentralized health system.health policy and planning 2006; 21: 40-52.
9. Lippeveld T. Routine Health Information Systems: The Glue of a Unified Health System. In: The RHINO workshop on issues and innovation in routine health information in developing countries, The Bolger Center, Protomac, MD, USA 14- 16 March 2001. Arlington,VA 22209, USA: MEASURE Evaluation, JSI Research and Training Institute, 2001;2:13-27.
10. Sauerborn R and Lippeveld T 'Introduction' in Design and Implementation of Health Information Systems. WHO: Geneva. Ch. 1. (2000)

11. da Silva AS and Laprega MR. Critical evaluation of the primary care information system (SIAB) and its implementation in Ribeiero Preto, Sau Paulo, Brazil. Cadernos de Saude Publica, 2005; 21:1821-8.
12. Chae YM, Kim SI, Lee BH, Choi SH , Kim IS. Implementing health management information systems: measuring success in Korea's health centers. International Journal of Health Planning and Management 1994;3:341-8.
13. Gattini CH. Improving the Structure and Performance of National Health Information Systems, Operational Approach and Strategic Recommendations, PAHO/WHO Office in Chile(2009).
14. WHO. European Health Care Reform. Analysis of current strategies. European Series, Regional WHO No. 72 Office for Europe: Copenhagen(1997).
15. AbouZahar C and Boerma T : Health information systems: the foundation of public health, Bulletin of the WHO 2005;83(8): 578-83.
16. WHO. Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action. Geneva, Switzerland: World Health Organization, 2007-i-44.
17. Stansfield S. Structuring information and incentives to improve health. Bulletin of the World Health Organization, Geneva. 2005;83 (8):562-.
18. Mahler H. Springboard for Action for Health for All, The World Health Organization, the Thirty-Ninth World Health Assembly, Geneva, 6 May(1986).
19. WHO. Primary Health Care: Report of the International Conference on Primary health care, Alma Ata. Geneva: WHO (1978).
20. Gattini C. 'Investing in better health information systems: strategic recommendations for effective implementation and maintenance', in Health in Regional Development. CARICOM: Guyana (2007).
21. Gattini CH. Improving the Structure and Performance of National Health Information Systems, Operational Approach and Strategic Recommendations, PAHO/WHO Office in Chile(2009).
22. Measure Evaluation. Tools for Data Demand and Use in the Health Sector. Performance of Routine Information Systems Management (PRISM) Tools(2011).
23. Hozumi D, Aqil A , Lippeveld T. Pakistan situation analysis. MEASURE Evaluation Project, USAID(2002).http://www.who.int/healthmetrics/en/
24. Aqil A, Lippeveld T , Hozumi D. PRISM framework: a paradigm shift for designing, strengthening and evaluating routine health information systems. Health Policy and Planning: 1–12(2009).
25. Aqil A, Hozumi D, Lippeveld T, Beke A, Gragg B, Hedberg C, LaFond A, Matjila J, Shields K and Stoops N. Improving RHIS Performance For Better Health System Management, MEASURE Evaluation(2010).
26. Belay H and Lippeveld T. Inventory of PRISM Framework and Tools: Application of PRISM Tools and Interventions for Strengthening Routine Health Information System Performance, Measure Evaluation(2013).
27. Aqil A, Lippeveld T, Moussa T , Barry A. PRISM Tools User Guide; MEASURE Evaluation/JSI Publication(2009).