Organizational Facilitators and Barriers to Implementing Effective Clinical Audit: Systematic Review

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ABSTRACT

BACKGROUND: Clinical audit is a systematic and critical analysis of "quality of care" to improve clinical care. This study was aimed to find organizational and managerial facilitators and barriers of effective clinical audit implementation in hospitals.

METHODS: A systematic literature review was performed using the PubMed, Google Scholar and Cochrane databases with key words of "clinical audit", "effective audit", "evaluation of audits" and "medical audit" supplemented by hand-search. Content analysis was used to identify external and organizational factors that influence implementation of clinical audit.

RESULTS: Of the 53 scientific articles about clinical audit, 4 core themes with 11 main themes and 50 subthemes related to negative factors affecting clinical audit and 5 core themes with 15 main themes and 92 subthemes about organizational facilitator factors were found. Resource limitation, poor information management system, lack of audit support centers, excessive workload and time constraint, lack of organizational support for building audit team, unavailability of evidence-based guidelines and bureaucratic hurdles were highlighted as organizational barriers in clinical audit. On the other hand, instructional support, effective training programs, participation of local ownership, high capacity for quality improvement, intensive feedback mechanisms, resource commitment and rational basis for allocation and evidence-based researches for setting standards are mentioned as factors which promote effectiveness of clinical audit programs.

CONCLUSION: For clinical audit and its role in improving quality of care, identifying barriers, and facilitating factors in organizational setting can help managers and professionals to prepare the organizations which are suitable for implementing the clinical audits in proper manner.

Keywords: Clinical audit; Effectiveness; Organizational factors; Barriers; Facilitators; Systematic review

INTRODUCTION

Improving quality of care and performance of healthcare professionals is important goal of patient and quality improvement programs [1-3]. Evaluating the quality of services can help us to reform resource allocation and useful interventions [4]. Furthermore, health care quality assessment enhances the standard of care through health care priority setting, ethical standards improvement and appropriate utilization of resources [4]. On the other hand, in order to improve clinical practice, standards of health care quality should be based on availability and acceptability of care and should be documented with reliable information [5, 6]. Quality improvement requires a systematic program involving all hospital staff with focus on quality through diverse evidence-based activities such as clinical audit [2, 7, 8]. Implementation of

quality improvement program is a priority for many healthcare organizations [9]. Clinical audit is an integral part of clinical governance and is a reliable tool to evaluate quality of care delivery and to monitor [4, 10]. Clinical audit can also be considered as a managerial tool that improves services through critical and systematic analysis of the availability, utilization and acceptability of service provision [11].

Health care organizations must have a multifaceted approach to delivery of appropriate and effective patient care [12]. Organizational environment and managerial system are the most important elements for success in clinical audit programs [13-15]. Philosophy of identifying the current standard of practice and its potential to make improvements in audit process, suggests that there is a need for commitment and support of all decision makers and managers to design and implement audit programs [8, 16, 17]. Identifying organizational strategies will help professionals to do effective audit. Otherwise, audit would become an unreliable approach to quality assurance if we don't find how and when it works in a desirable manner [7, 14].

This study was aimed to find facilitators and barriers in implementing effective clinical audit in hospitals. By knowing these items we can prepare organizational settings for appropriate implementation of clinical audit programs and as a result we hope to achieve major improvements in patient care and services.

MATERIALS AND METHODS

Data sources and search strategies: We performed literature search using public databases PubMed, Google Scholar and Cochrane databases with key words "clinical audit", "effective audit", "evaluation of audits" and "medical audit". The indexes of the BMJ, oxford journal and clinical audit journal were hand searched for additional articles. Reference lists of related articles were reviewed to identify other relevant articles.

Articles were included if they referred to only clinical audit, evaluated clinical audit effectiveness facilitators and barriers, were either original articles or review articles. We excluded articles that reported results of a clinical audit without reporting on the process or that discussed clinical audit effectiveness without commenting on the facilitators or barriers.

The relevance of articles was determined by the investigators and key elements from the relevant articles were identified by two investigators. The

findings were arranged into main theme and sub themes following which a category of themes was prepared and then discussed among the investigators and classified into themes.

This qualitative process was carried out by application of content analyses approach and the aim was to clarify the declared elements in the literatures which would lead to a greater understanding of facilitators and barriers related to organizational environment for implementing clinical audit.

Content analysis was used to categorize written messages. Content analysis of transcripts was done by two authors to code and crumble main categories to expanding themes after consultation. The data were determined for the purpose of the study and the categories are derived from the data in content analysis.

RESULTS

We found 5495 article through our search

Figure 1: Flowchart of the literature search
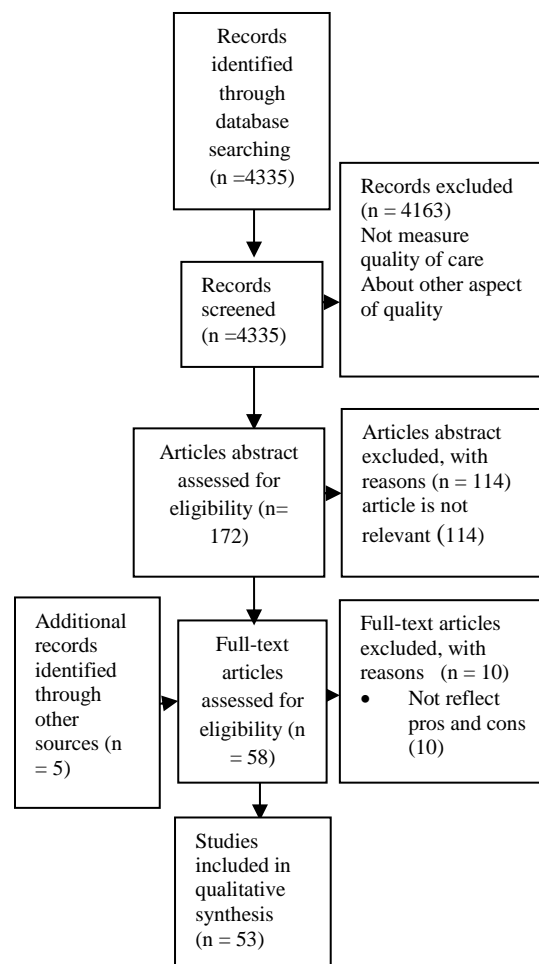
Table 1: Organizational barriers affecting clinical audit effectiveness

Row	Field	Theme	Sub-theme
1	Audit resources	resources	▪ Resource limitation [4] ▪ Inappropriate resource allocation [8, 20] ▪ Disappointing economic evaluation result [8, 21] ▪ Insufficient expertise in audit and standard setting [4, 13, 20-23]
2		Information	▪ ▪ Lack of specific data collection instructions [3, 24-27] ▪ High cost of data collection [5, 28] ▪ Confidentiality issues in data collection [29] ▪ Difficulties in reporting result [29] ▪ Poor validity of data [30] ▪ Lack of monitoring system feedback process [22, 24]
3	Humanitarian factor	Auditors	▪ Lack of experience and skill [23, 31] ▪ Lack of audit support centers [22, 23] ▪ Lack of awareness about audit advantages [22]
4		Behavioral factor	▪ Low motivation for audit in developing countries [4, 5, 25] ▪ Excessive workload & time constraint [5, 8, 22, 23, 25, 26, 28, 31, 32] ▪ Lack of commitment to quality improvement [8, 15, 22, 31] ▪ Fear of change and resistance against change [5, 8, 22, 33] ▪ Unawareness of rules and relevant regulations [8, 22] ▪ Nonuse of audit results and demoralization of staff [8, 16] ▪ Poor participation of staff and patients [5, 15, 29, 34] ▪ Asymmetric involvement from different professional groups [31] ▪ Difference in physicians preferences [6]
5		Team work	▪ ▪ Disaffiliation between profession [8, 22] ▪ Lack of organizational support for building audit team [10, 35] ▪ Cultural differences between profession [31] ▪ Lack of commitment to agreements [10] ▪ Weak partnerships between specialty departments [6]
6	Technical problem	Quality assessment methods	▪ Problem in selecting criteria for assessing quality [24, 31, 34, 36] ▪ Lack of quality policies [5] ▪ Lack of systematic and critical analysis of quality [4]
7		Standard setting and lack of standards	▪ ▪ Unavailability of evidence based guidelines [35, 37, 38] ▪ Lack of validated tools for measuring patient satisfaction [25] ▪ Concerning the use of national standards [5] ▪ Criticism of national standards [20]
8		Uncertainty about effectiveness	▪ ▪ Technological differences [39] ▪ Uncertainty about investment in audit [5, 8, 10, 25] ▪ Lack of enough information about the effective methods [8, 25] ▪ Disappointing cost benefit result [8]
9		research	▪ Confounding factors [31] ▪ Lack of skill in qualitative research methods [10, 40] ▪ Lack of research infrastructure in local audits [30, 37]
10	Organizational factors	Implementable in real setting	▪ Imprecise in objectives [40] ▪ Instability in staff member [26] ▪ Differences in local priorities and situation [41] ▪ Not able to generalize results and methods [41-43] ▪ Inadequate intersectional participation [35]
11		Organizational Structure	▪ Absence of an overall plan [22, 23] ▪ Bureaucratic hurdles [23, 35, 37] ▪ Lack of managerial support [8, 16, 33] ▪ Lack of organizational commitment [21]

strategy and 53 articles were found to be relevant and data from these articles were extracted (Figure 1). The literature review found 4 core themes with 11 main themes and 50 subthemes related to factors decrease the effectiveness of clinical audits in organizational setting and also 5 core themes with 15 main themes and 92 subthemes about organizational environment and programs which lead to effective clinical audit (Tables 1 and 2).

Organizational barriers face clinical audit: Resource available for audit is one of the most important factors in audit success. Thirteen studies found that insufficient resources and expertise and lack of specific data collection and information instructions were important barriers. Human factors were identified as barriers in 22 studies. Examples of these factors include auditor related factors, behavioral factors and team work issues. Technical challenges, such as implementation of quality assessment methods, setting sustainable standards, and uncertainty about the effectiveness of clinical audit were reported by seventeen studies. Organizational factors, such as implementation of audit in real settings, organizational commitment, and lack of managerial support were identified as critical factors in 13 studies.

Organizational facilitators affecting effectiveness of clinical audit: Human resource management factors, such as Staff characteristics, motivation level and educational programs, were classified as important factors to assure the effectiveness of clinical audit programs. We found 31 studies that suggested a successful clinical audit depended on considering the views of all participants, encouraging participation, and a good attitude towards audit. Organizational environment was identified by 21 studies as important in conducting an effective audit. Nineteen studies identified quality management structure as important factor which includes quality assessment, feedback process, patient involvement and provision of adequate resources. Appropriate information management at all levels and tasks such as information on best practices, practical hospital information systems, availability of accurate, reliable and valid data about professional performance, accurate medical records and high quality hospital notes were identified as important factors in 29 studies. Good clinical audit team, appropriate choice of topics, appropriate characteristic of audit process, evidence based standards and guidelines were

noted in 34 studies as important facilitating factors. Standards and guidelines have key roles in most processes such as clinical audit. Set of evidence based standards and explicit best practice guidelines can facilitate an organization's way to achieve the good clinical audits.

DISCUSSUION

Clinical audit programs face many barriers in most organizational setting. However, some organizational factors can facilitate implementing clinical audit in an effective manner. In this study we identified 11 main themes with 50 sub themes which are categorized in 4 fields that limit the clinical audit effectiveness and 5 fields with 15 main factor and 92 subthemes that facilitate it.
Most often, failure of clinical audit may occur as a result of organizational weakness or incapability in providing sufficient audit resources [24]. Organizations have limitations in several areas including inadequate communication skills, weakness in clinical decision making, lack of support [22], and lack of skilled expertise in all professions which handle the audit programs [13, 24]. Graham's study shows audit would be a powerful and useful tool to improve and evaluate the quality of health care if its limitations and constraints are eliminated [13]. In this regard, the quality and availability of information can have a major effect on implementation of clinical audit activities. Inaccurate data [30] and inappropriate information about hospital activities [30] can limit audit implementations and whenever organizations do not have enough knowledge or information they cannot realize how well they are doing [3, 30].
Other factors identified as barriers to an effective audit are inadequate resources and inappropriate methods of resource allocation. Dermot Maher's identified that resources are the most necessary requirements of clinical audit programs. Because of the resource limitations, decision makers do not give priority to clinical audit in most of the organizations [4].
In spite of resource limitation, dysfunctional bureaucracy [22] and weak responsibility of chief management [22] make audit programs difficult to implement. Because of the excessive workload, unawareness of auditors about clinical audit advantages and fear of audit results, most health professionals do not prefer to undertake clinical audit [4, 22].
Variability of effectiveness of quality assurance

Table 2: Organizational and managerial facilitators affecting clinical audits' effectiveness

Row	Field	Theme	Sub-theme
1	Human resource management	Staff characteristics	• Good attitudes and perceptions to audit [31] • Understanding the impact of changes and purpose of audit [25, 39, 44] • Good communication skills [37, 43] • Dedicated staff to audit program [22, 45] • Trained and experienced doctors [11]
2		Motivation	• Motivation for changing behavior [7, 21] • Real support from the top manager [20, 39] • Incorporate all viewpoints [10] • Support by senior consultants [27] • Financial incentives [5, 7, 9, 12, 20, 36] • Voluntary and appropriate participation in planning and implementing [29, 35, 42, 46]
3		Education and training	• Training and education program on clinical audit [3, 19, 25, 27, 39] • Participation of providers at all levels in education process [7, 13] • Regular and continues education [6, 16, 43, 47] • To clear educational needs [6, 42] • Instructional support and effective training [5, 9, 22, 23, 29, 40] • Supporting education and encourage teaching environment [2, 6, 12] • Motivational mechanisms of education [34, 35]
4	Organizational and Structural factor	Local items	• Participating local ownership and leadership [7, 10, 19, 23, 37] • Use of local control [19] and setting local standards [35, 38] • Involving local research activities [41] • District general manager of the resources [43] • Local consensus process [7] • Circulate local guidelines to all members [26] • Organizing local audit teams [3] • Developing local action plans for quality improvement [29]
5		Organization	• well managed organization [10, 39, 48, 49] • Building capacity for quality improvement and audit program [1, 7, 39] • Supportive organizational structures and culture [7, 23] • Providing strategic support [12, 30, 39] • Encouraging clinicians to use evaluation process [12, 29] • Identifying exist organization strategy [42] • Formal and feasible regulations with respect to QA activities [5, 19, 39] • Appropriate administrative and professional policies [6]
6	Quality management structure	Quality assessment	• Assess the quality by studying the process as reflected in records [24, 44] • valid, empirical and normative criteria for quality [19, 24, 38, 50] • Comprehensive assessment of quality [34, 41, 48] • Presenting result of assessing quality of advice and guidance [29] • Commitment with insurers for quality assurance [5, 51] • Sustained involvement in change and audit process [23, 29, 42] • Regular meetings with colleagues on QA [5, 9, 10]
7		Feedback	• Existence of feedback mechanisms [1, 10, 16, 40] • Feedback for the community outreach team [44] • Regular analysis of structure, process and outcome [4, 10, 41, 42, 48]
8		Patient involvement	• Attracting patient acceptance [4, 10] • Patient or client participation [5, 10, 21, 29, 35, 42, 46] • Good attitudes towards audit [31, 50] • Encouraging patient mediated interventions [7, 50]
9		resources	• Resource commitment and rational basis for allocation [1, 35, 39, 44, 49] • Taking account resources available [36, 38] • Educational materials and adequate hardware and software [7, 43]
10	Information management	Data	• Accurate, timely, reliable & valid data [5, 6, 19, 27, 30, 42, 49] • Collecting sufficient data about all patient in a long period of time [27, 44] • Ensuring accuracy and comprehensiveness of data [43, 48, 52] • Use of standardized data collection method [5, 18, 27, 29, 30, 47] • Standard process of data abstraction [47, 52] • Commitment of all stakeholder in data collection [9, 53] • Access to appropriate data sources [6, 30, 35, 43] • Accurate medical records [11, 24, 35, 41] • Trained data management staff and department [24, 35] • Existence of data about providers performance [9, 10]

11		Information	▪ Opportunities for networking [15,38] ▪ Providing physicians with cost information [36] ▪ Use of a system to record audit process [19] ▪ Intelligible, easily digestible and attractively presented information [54] ▪ Monitoring the recording of information given to patient [30] ▪ Establishment of practical Hospital Information System (HIS) [30]
12	Audit activity	Clinical audit team	▪ Supporting collaboration between individuals [23] ▪ Physicians full participation in audit activities [21, 54] ▪ Establishment of the clinical effectiveness groups [44] ▪ Establishment of quality related committee [6, 49] ▪ Establishment of audit and utilization review committees [6, 10, 20] ▪ Commitment of all stakeholders [13, 16, 54]
13		Choice of audit topic	▪ Identify limited area to improve at a time [18, 24, 35] ▪ Identification of high-risk groups [44] ▪ Identifying well-documented problems [7, 29]
14		Audit process	▪ Regular selecting, planning, and undertaking audit projects [19, 21, 39] ▪ Centrally controlled and initiated [19, 35] ▪ Developing structured tools for audit program [10, 19, 29, 39] ▪ Successful application of new knowledge, skills, and attitudes [21, 29] ▪ Sharing results and experiences on a regular basis [19, 44] ▪ Structured and substantial program of audit activity [22, 23, 29] ▪ Fair interpretation of audit result [42] and peer review of audit findings [19] ▪ Plans to re-audit [10, 18, 42, 48]
15		Standards and guideline	▪ Evidential basis and high quality research for setting standards [7, 10, 18, 19, 40, 42, 43, 49, 55] ▪ Defining measurable outcomes [7, 10, 49, 55] ▪ Definition of good practice and optimal care [7, 36, 47, 48] ▪ Continues monitoring of standards [21, 40] ▪ Agreed upon and objective preselected standards [33, 48, 49] ▪ Adoption of standard policies [30] ▪ Encouraging emissions and compliance of standard between staff [27, 30] ▪ Use of economic evaluation in guideline setting [4]

mechanism and lack of assessment methods are additional barriers to effective audit programs [19, 44]. As recognized in Mc Whine studies establishment of valid criteria of quality healthcare is one of the technical challenges in assessing the quality of care [5, 24]. Therefore, the use of high quality evidence based research to select criteria is suggested in Grol and Wensing's study [5, 31, 37, 56].

Discrepancy between theory and practice and lack of plan are common barriers in real organizational settings [19]. According to Walsh's study, clinical audit projects can achieve incredible improvements in patient care, but when conducted without overall plan, such projects can waste time and resources, with minimal benefit and may even harm individuals, lower motivation and subsequently make it problematic to involve professionals in future clinical audit programs [39].

In addition to identifying the barriers affecting clinical audit we should look for the factors that can enhance clinical audit effectiveness and facilitate its implementation. In an effective clinical audit program, a permanent and motivated staff is an advantage and taking their view into account is a necessity [7, 10, 20, 23, 29]. As indicated in Lord and Littlejohn's study, factors such as health professionals' motivation to participate in, and their attitude to audit have great effect on success [31].

As identified in Shaw's study, local ownership and active role of community physician [11] is paramount for an effective clinical audit. Use of local professionals' capabilities in audit projects may lead to better acceptability of findings [7, 34]. In other words, local ownership of the program enables clinical audit to be implemented in suitable way [39].

Several studies show that two factors have positive effects in implementation of clinical audit: first an environment where audit is recognized as a priority, and second the existence of a systematic program for clinical audit [10]. In addition, a supportive organizational culture have critical effects on effectiveness of audit programs [23]. Such supportive environment, can be achieved through organizing general practitioner groups [5], provision of skilled human resources [16] and mobilization of the principal working groups [4, 20, 42].

Furthermore, comprehensive assessment of quality is essential for successful clinical audit and its effectiveness [2, 9, 41]. As mentioned in many studies, clinical audit can be effective if intensive feedback is fed into the system on time [10, 40]; Yorston's study suggests that group feedback is more effective than personal feed-

back [7]. Social acceptability of the audit are other factors that influence the effectiveness of clinical audit [5, 23, 41]. Studies have revealed that patient participation in audit programs in essential [4, 10].

In order to have effective clinical audit, information systems are essential [9] and quick availability of good data from routine hospital records [54].

Availability of appropriate and on time clinical information from medical records [36] and managerial information [30] are some of important and facilitating factors in clinical audit [11, 24, 36]. Thereby, a clinical audit program needs: first collecting data to find out what is happening in reality and second, to compare data with pre-selected standards in order to direct the audit process [10, 12, 30, 57].

Since clinical audit compares practices with standards, developing approved standard through skilled teams is considered a facilitating factor [39]. Benjamin's study mentions that standards should be realistic and should be developed by team members' active participation [10]. In order to implement and develop guidelines for clinical audit process, there is need for a structured approach with emphasis on goals, aims and objectives of audit programs [19]. Finally the commitment of quality improvement committee and involvement of its members in designing the audit criteria is considered to be an advantage [5, 40].

In summary, we conclude that identifying barriers and facilitators facing the clinical audit at organizational setting can help managers and professionals to prepare the organizations for implementation of effective clinical audits. Understanding these barriers and facilitators in preparing organizational audit programs would help organizations to conduct audit programs more effectively, and achieve desired outcomes and would encourage staff to participate in future clinical audit programs.

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