Evidence-based management - healthcare manager viewpoints

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Introduction

There has been an intensive effort to develope new organization and administration models in the last 20 years (Acton, 1998; Axelsson, 1998; Baba and HakemZadeh, 2012; Barends and Briner, 2014; Briner *et al.,* 2009; Briner and Walshe, 2014). One model is evidence-based management (EBMgt) (Axelsson, 1998; Bullock *et al.,* 2012; Guo, 2015; Jaana *et al.,* 2013). Hospitals, are among the main organizations in the community that provide medical care services (Ford-Eickhoff *et al.,* 2011). Shifting healthcare perspectives over the last two decades has complicated hospital management (Ford-Eickhoff *et al.,* 2011). Consequently, complex hospital management, as a skill and specialty, has become an important and pivotal issue (Alexander *et al.,* 2007; Ford-Eickhoff *et al.,* 2011). Therefore, managers are forced to use evidence-based healthcare management (EBHCMgt) to be effective (Guo, 2015; Hewison, 2004; Liang *et al.,* 2012; White *et al.,* 2005). Evidence-based healthcare management improves organizational and managerial decisions by bridging theory and practice gaps, which has a critical impact on hospital performance (Alexander *et al.,* 2007; Axelsson, 1998; Guo, 2015; Hewison, 2004; Liang and Howard, 2011; Liang *et al.,* 2012; Majdzadeh *et al.,* 2012; White *et al.,* 2005). Evidence-based management is rooted in evidence-based medicine (EBM) - a new approach to management practice that requires healthcare managers to change (Axelsson, 1998; Guo, 2015; Walshe and Rundall, 2001). Like EBM, EBMgt is a tool to respond to questions about a decision's consequence (Pfeffer and Sutton, 2007; White *et al.,* 2005).

We live in an evidence-based everything era and that everything: medicine; nursing; healthcare management; decision making and hospitals, have become information-based (Acton, 1998; Liang *et al.,* 2012). Hospital manager decisions have a significant impact on service quality and hospital success (Guo, 2015). If healthcare managers don't pay attention to evidence-based decision making (EBDM), then they will face problems such as disorganization and useless work. Yet, recent studies show that only 15 percent of physician decisions are evidence based, so can physicians be hospital managers? (Rousseau *et al.,* 2008; Walshe and Rundall, 2001). High-quality hospital management is believed to have a positive impact on mortality, staff well-being, employees efficiency, performance and productivity (Agarwal *et al.,* 2016). Iranian hospitals continue to change into dynamic environments, partially owing to recent political and also regulatory evolution (Kiaei *et al.,* 2015). Hospital management requires professional skills and hospital management - a specialized discipline demanding training and skills - cannot be exclusively acquired in the job. Most Iranian hospital administrators are physicians (Rabbani *et al.,* 2015). Several management and medical informatics schools in Iran educate students and produce chief executive officers (CEOs). However, hospital managers are rarely employed in managerial positions. Low expertise in management and weak direction are the main reasons why many important hospital initiatives fail (Rabbani *et al.,* 2015). One primary step to promote EBDM is to identify the challenges facing EBMgt. Recognizing specific EBMgt attitudes and perceived barriers can promote new workplace-behaviors. Our purpose, therefore, was to determine Iranian hospital EBMgt's components and challenges.

Theoretical/conceptual framework: EBMgt

Evidence-based management, an evolving discipline, originally borrowed from EBM, started in the early 1990s (Barends *et al.,* 2015; Guo, 2015). Evidence-based is a term created in the 1990s

in medicine (Barends *et al.,* 2014); nowadays its principles extend to various disciplines including nursing, education, criminology, social work and public policy (Barends *et al.,* 2015). Inspired by the EBM movement, Axelsson (1998) introduced an innovative approach, calling it evidence-based management, which he advocated to mean that healthcare managers should learn to search for and critically appraise evidence from management research as a basis for their practice. There are many standpoints regarding EBMgt that are inspired and presented by management and organization specialists. Axelsson (1998), Walshe and Rundall (2001), Rousseau *et al.,* (2008), Pfeffer and Sutton (2007), Briner *et al.,* (2009), Barends *et al.,* (2015) and Wright *et al.,* (2016) investigated EBMgt, its applications and component. According to the EBM pyramid, the literature presents different evidence levels that can be used by managers and other healthcare professionals in their decision-making process. Evidence sources include: (i) best available scientific research; (ii) organizational data; (iii) professional experience and judgment; (iv) stakeholder values and concerns (Barends *et al.,* 2015; Hewison, 2004; Jaana *et al.,* 2013; Liang and Howard, 2011; Liang *et al.,* 2012). The EBMgt theoretical framework is shown in Figure 1, which includes two phases.

Figure 1 here

The first phase is the EBDM cycle, which is implemented in six consecutive stages. The second phase is evidence sources to be considered when making decisions. Many factors play different but significant roles that affect EBMgt, including: (i) facilitators; (ii) barriers; and (iii) predictors. Based on the literature, therefore, we divide EBMgt into three phases (Guo, 2015; Hyder *et al.,* 2010; Liang *et al.,* 2012; Majdzadeh *et al.,* 2008):

First Phase (1998 - 2005): Introducing and offering: the EBMgt movement lasted from 1998 to 2005. Throughout, writers began to formulate EBM and apply its principles to healthcare management practice.

Second Phase (2006 - 2012): Publishing and production: ran between 2006 and 2012. During this time, more scholarly EBMgt articles and books were produced.

Third Phase (2013- future): Adoption and utilization: proceeded from 2013 and continues. Healthcare EBMgt been discussed for more than 16 years. Therefore, it seems important to consider the challenges and factors affecting EBMgt in healthcare organization, especially complex organizations like hospitals. Identifying challenges, based on the healthcare managers' viewpoints, can assist hospital managers and researchers.

Methods

Study design and sample

We used qualitative methods to achieve our aims. Semi-structured interviews with 45 participants were conducted in 2016. We also ran three focus group discussions (FGDs) with 27 health managers. Participants included policy-makers and MOHME managers, research managers and policy-makers elsewhere, hospital managers, health policy, management and health research, and experienced administrators. Participants' characteristics are displayed in Table I. Iranian Center of Excellence in Health Management (ICEHM) staff sent a formal letter

explaining the study to 56 experts in seven provinces (Tehran, East Azerbaijan, West Azerbaijan, Qazvin, Ardabil, Yazd and Hamadan). Forty-five agreed to be interviewed.

Data collection

The FGDs involved researchers and healthcare managers, and in-depth interviews included policy-makers and managers. Before the interviews, top managers in each organization identified, named and defined change initiatives, which were underway. Nine participants participated in each FGD. Interviews continued until data saturation was achieved. Both interviews and FGDs were conducted by one researcher and one note-taker. Interviews and FGDs lasted 60 to 90 minutes. Our research questions (RQ) investigated manager viewpoints and barriers to EBMgt:

RQ1: What evidence sources did managers consult in their decisions?
RQ2: What are the managers' views about hospital EBMgt?
RQ3: What contextual barriers do managers perceive when using EBMgt?
RQ4: What are the managers' views about EBMgt components?

Table I here

Interviews included questions on Iranian hospital EBMgt challenges and components and its implementation procedures. We used the Tehran University of Medical Sciences (TUMS) knowledge translation model to design in-depth interviews and FGDs guidelines (Majdzadeh *et al.,* 2008). A semi-structured questionnaire was developed for both FGDs and in-depth interviews, which included: EBMgt's meaning, features, benefits, predictors, challenges and outcomes and factors influencing EBMgt, organizational processes involved in implementation, what has and has not worked well and what is needed for the future. Open questions were used to encourage participants to elaborate their EBMgt experiences. We used a questionnaire to collect demographic data. Other questions asked about evidence sources, current knowledge and participants' attitudes to EBMgt.

Analytical approach

Our qualitative analysis, based on previous knowledge about EBMgt, aimed to investigate challenges to better understand hospital EBMgt. We applied deductive content analysis when coding interview data, using the theoretical framework dimensions (discussed earlier). All transcripts were read. Challenges and components were coded as themes. Homogeneous themes were composed, and categories created. To achieve triangulation, a weekly research meeting was held to discuss interview status and feedback, and to seek consensus about any interview coding issues. During the coding process, researchers made an initial pass through the transcripts followed by coding clarification and assignment criteria. Next, they reevaluated code assignments and made corrections based on the definitions that resulted from discussion in research meetings. All documented in-depth interviews and FGDs were reviewed independently by two researchers to ensure reliability. When there was disagreement, the group made the final decision.

Ethical considerations

The project proposal was approved by the Tabriz University of Medical Sciences ethical committee (project code: TBZMED.REC.1395.497). After the study's objectives had been explained, participants' oral consent was obtained at each session.

Results

Forty-five interviews (27 men) were administered between June and November 2016). Mean age was 39.4 (sd = 9.34) years. Participants' average work experience was 11.1 (sd = 8.47) years (Table II). Twenty-nine participants had PhDs.

Table II and III here

As Table III indicates, most respondents based their management decisions on: (i) literature (91.12%); (ii) knowledge acquired through formal education (86.67%); (iii) scientific research (75.55%); (iv) personal judgment (71.12%); and (v) advice from colleagues (60+%). Only a few participants said that they based their decisions on trial and error (13.34%). Results showed that most participants were familiar with online databases. All were familiar with Google Scholar and 90% knew other databases including PubMed/Medline, Web of Science, SID and Magiran. Only, 17.18% used Cochrane. Our results show that most participants weren't familiar with research terms like: controlled study (22.23%); confidence intervals (20%); sensitivity (28.89%); generalizability (28.89%); bias (15.55%); and systematic reviews (26.67%). Ninety-one percent had conducted scientific research. Almost, all believed in ethical evidence. Only, 26.67 percent read a research article every day. Table IV shows the main themes, sub-themes and final codes for each EBMgt dimension: EBMgt evidence sources, predictors and barriers; and evidence-based hospital management (EBHMgt) processes. According to the final codes we extracted, evidence sources were divided into six categories: (i) scientific and research evidence (SRE); (ii) hospital facts and information; (iii) political-social development plans; (iv) professional expertise; (v) ethical-moral evidence (EME); and (vi) stakeholder values and expectations. These evidence sources determined administrators' management domain. An evidence-based hospital manager is someone who has full control over all evidence sources.

Table IV here

The main predictors we identified were: stakeholder values and expectations; functional behavior; knowledge; key competencies and skill; evidence levels and use; benefits and programs, which were closely related to other main themes. These predictors determined EBMgt's theoretical framework (Table IV). The EBMgt barriers were categorized into the following areas: barriers related to managers' characteristics; decision-making environment; training and research system; and organizational barriers. To understand the barriers, we described the categories in more detail (Table IV). Quotations and their interpretation confirmed that evidence-based hospital management was like the EBDM process. Our results show that EBHMgt contains six stages: (i) asking; (ii) acquiring; (iii) appraising; (iv) aggregating; (v) applying and (vi) assessing. Results indicate that at the beginning, the practical issue or problem must be translated into an answerable question. Then, evidence is searched systematically. In the third phase, evidence should be appraised using appropriate tools. Afterward, hospital managers

should aggregate the evidence and decide using the best evidence. At the end, decision outcomes must be evaluated.

Discussion

We identified the EBMgt barriers evidence sources as EBMgt predictors and EBHMgt, looking from researchers' and managers' perspectives. Hyder *et al.,* (2010) identified the challenges and strategies when using knowledge in developing countries. Inappropriate communication, heterogeneous aims and researchers/decision-makers' languages, policy-makers' limited professional skill, resource restrictions, organizational culture and parliamentary and budgetary policies were identified as the main barriers. According to Majdzadeh *et al.,* (2012), Iranian health system EBDM barriers are categorized into: decision-makers' characteristics; decision-making environment; and research system.

Barends *et al.,* (2015) investigated managers' attitudes in Belgium, Netherlands and the United States. Most respondents (60%) reported that they had insufficient time to read research articles and they regarded time limitation to be the main barrier. Also, not understanding scientific research (56%) and research ambiguity (42%) were the main barriers. Other barriers to managers' using scientific research were organizational culture. The main barriers we identified were consistent with systematic reviews in medicine, nursing and other studies (Guo, 2015; Kajermo *et al.,* 2010; Patelarou *et al.,* 2013; Solomons and Spross, 2011; van Dijk *et al.,* 2010).

According to principles, evidence must be: scientific; organizational; experiential and stakeholder (Barends *et al.,* 2014). In our study, this classification was changed. Interviewees suggested that evidence sources were categorized into six domains. Evidence-based managers are like spiders; i.e., they dominate all six evidence sources. As shown in Figure 2, we identified EBMgt evidence sources and management domains. Depending on the problem, using the EBHMgt process, managers will select the best available evidence and sources. Participants believed that political-social development plans and ethical-moral evidence can be useful evidence sources in the decision-making process.

Figure 2 here

A fully evidence-based hospital manager is a person who uses evidence sources in a six-step decision-making process. Hospital managers should use the best evidence based on the problem and population. Those who use only one evidence source, cannot make decisions properly. As shown in Figure 2, depending on the source, managers may decide on one or several areas in all organizational decisions. Hospital EBMgt predictors can provide information on the gaps between knowledge and practice to improve decision-making processes (Guo, 2015). The main predictors in our investigation were: stakeholder values and expectations; functional behavior; knowledge; key competencies and skill; evidence sources and levels; evidence use and benefits; and government programs. Although our findings agree with Guo (2015), Barends *et al.,* (2015) didn't find a significant relationship between education, experience and attitude towards EBMgt. Liang *et al.,* (2013) conducted a mixed-method study in Australian public hospitals and showed that evidence-informed decision making required certain skills, knowledge and attitudes. A positive attitude toward EBMgt, adequate and appropriate knowledge from hospital and management and EBDM skill are EBMgt predictors. Almost, all participants (n = 44) believed that healthcare management can be evidence-based and had positive attitude towards EBMgt.

The evidence-based hospital management framework is a useful tool to better manage all healthcare organizations. In this framework, predictors, barriers, evidence sources and process EBHMgt are explained and identified. It is essential to understand the context and interaction between these factors. In that context, factors such as predictors, barriers and training organizations, and research institutes can improve decision-making. In the Liang *et al.,* (2012) study, framework determinants can improve the evidence in managerial decision making. We suggest that evidence-based decision-making is important when making management decisions. In 2013, the elected Moderation and Development Party (MDP) began to change the health sector; i.e., the Health Sector Evolution Plan (HSEP) or Health Transformation Plan (HTP) were designed by the Ministry of Health and Medical Education (MoHME) to achieve universal and comprehensive health services coverage. However, policy makers should not fail to engage evidence-based professions (Moradi-Lakeh and Vosoogh-Moghaddam, 2015). To create and implement evidence-based evolutions; we need to teach evidence-based healthcare managers to apply their professional and expertise (Goodman *et al.,* 2014; Niedźwiedzka, 2003). To adopt and use EBMgt, hospital leaders need to promote a culture that helps managers to dedicate time to consult scientific evidence. Staff in educational institutions need to focus on improving evidence-based management skills that are needed to find, read, evaluate and apply scientific evidence. University leaders need to train academics about methods needed to critically appraise and summarize the best available evidence on a topic relevant to best practice.

Conclusion

Our study suggests that most participants have positive EBMgt attitudes and that most believe that using evidence-based management can improve management decision making. Evidence-based hospital management can improve management decisions and service delivery, effectiveness and efficiency. Since EBMgt is an emerging approach, its practice among hospital managers has been limited. Several factors exist at organizational and personal levels, which play different and considerable roles. We know that many healthcare managers lack EBMgt skills. Thus, they need to instigate evidence-based management through training organizations and research institutes. Our framework helps hospital managers to pursue the multiple evidence sources in knowledge utilization processes. Using six evidence sources, managers recognize the best available evidence for management decisions and in an evidence-based decision-making process to make the best decision. To increase EBMgt benefits and use in hospitals, training organization and research institute staff must involve hospital managers to set research programs and to guide and facilitate evidence interpretation.

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Table I: Research participants

Provinces (n= 8)	Organizations (n= 16)	Position	Number
East Azerbaijan	ICEHM	Expert in management sciences, associate professor in health policy, economics and management, managerial experience, senior manager in ICEHM	**9**
East Azerbaijan	Iranian EBM Centre of Excellence	Senior manager in Iranian EBM Centre of Excellence, expert in systematic reviews and knowledge translation	**4**
Tehran	MoHME	Office director in the hospital management and clinical service excellence, deputy of MoHME in the field of planning, senior manager in MoHME	**3**
West Azerbaijan, Qazvin and Tabriz	Health care organizations	Hospital manager, faculty members in health services management, associate professor in health care management	**6**
East Azerbaijan	Tabriz University of Medical Sciences	Associate professor in health services management and health information management, managerial experience in hospital	**4**
Tehran	Tehran University of Medical Sciences	Associate professor in health policy, economics and management; managerial experience	**4**
Yazd	Yazd University of Medical Sciences	Associate professor in health services management	**1**
Hamadan	Hamadan University of Medical Sciences	Associate professor in health services management, Managerial experience in health sector	**3**
West Azerbaijan	Uremia University of Medical Sciences	Managerial experience in health sector and associate professor in health services management	**1**
Tehran	Iran University of Medical Sciences	Managerial experience in hospital, Senior manager in faculty of health management, faculty members in health services management	**5**
Ardabil	Ardabil University of Medical Sciences	Professor, management science, managerial experience	**1**
East Azerbaijan	University of Tabriz	Associate professor of management science (organizational policy making)	**1**
Tehran	University of Tehran	Professor of management science, managerial experience	**1**
Tehran	Tarbiat Modares University	Professor of management science, managerial experience	**1**

Tehran	Allameh Tabataba'i University (ATU)	Professor of management science, managerial experience	**1**
Total			**45**

Table II: Interviewees

Demographics (n = 45)				
Qualitative variables			**Frequency**	**%**
Gender (percentage)	Male		27	60.00
	Female		18	40.00
current occupation group (percentage)	Managers		10	46.70
	faculty members		21	22.20
	Both		14	31.10
Highest level of education (percentage)	Masters		2	4.40
	Ph.D.		29	64.40
	MD		7	15.60
	MD, Ph.D.		5	11.11
	MD, Specialists		2	4.40
Main expertise and skill (percentage)	Strategic planning		11	20.00
	Change management		7	15.60
	Process improvement		5	11.10
	HRM		11	20.00
	Quality management		2	4.40
	Policy making		4	8.90
	Financing		5	11.10
	Accreditation		2	8.90
Quantitative variables	**Minimum**	**Maximum**	**Mean**	**SD**
Average age (years)	28	70	39.40	9.34
Average work experience (years)	1	39	11.11	8.47
Average health care management experience (years)	0	31	5.74	6.48

Table III. Healthcare manager viewpoints

Items		Frequency	Agree %
Decision making	Trial-error	6	13.34
	Intuition-insight	10	22.23
	Personal judgment	32	71.12
	Acquired knowledge	39	86.67
	Consult with internal colleagues	30	66.67
	Consult with external colleagues	28	62.22
	Management literature	41	91.12
	Internet	22	48.89
	Scientific research	34	75.55
Familiarity with online databases	Business Source Premier from EBSCO	9	20.00
	Science Direct from Elsevier	18	40.00
	PsycINFO	10	22.23
	Inter Science	9	20.00
	ProQuest	29	64.45
	Cochrane	8	17.18
	CINAHL	9	20.00
	Springer	28	62.23
	Ovid	25	55.55
	PubMed/Medline	42	93.34
	Scopus	32	71.12
	Web of Science	41	91.12
	Embase	9	20.00
	Emerald	19	42.23
	SID (Iranian)	42	93.34
	Magiran (Iranian)	44	97.78
	Google Scholar	45	100
Familiarity with research terms	Controlled study	10	22.23
	Observational study	23	51.11
	Case study	25	55.55
	Confidence interval	9	20.00
	Statistical significance	33	73.34
	Internal validity	20	44.45
	Reliability	20	44.45
	Sensitivity	13	28.89
	Generalizability	13	28.89
	Bias	7	15.55
	Correlation	18	40.00
	Systematic reviews	12	26.67
	Sampling	18	40.00
Do you have experience conducting scientific research?		41	91.12
Was there special attention given to scientific research in your formal education?		29	64.45
Do you believe ethical evidence?		44	97.78
Would you like healthcare management to be evidence-based?		44	97.78
Do you regularly search databases online? (once a week)		35	77.78
Do you regularly read research articles? (per day)		12	26.67
Are you familiar with health management journals? (more than twenty journals)		20	44.45

Table IV: Synthesis

Main themes	Sub-themes	Final codes
Evidence sources in EBMgt	Scientific and Research Evidence (SRE)	*Academic journals*
		Scientific evidence
		Research evidence
		Observational evidence
	Facts and information of hospital	*Hospital information system*
		Management dashboard
		Internal evidence
		Data and facts
		Supportive team of hospital
		Questionnaires and checklists
	Political-social development plans	*Government laws*
		Political-social programs
		Programs of MOH
	Managers' professional expertise	*Experience*
		Skill
		Profession
	Ethical-Moral Evidence (EME)	*Religious evidence*
		Ethical evidence
		Moral evidence
	Stakeholder values and expectations	*Values*
		Expectations and concerns
		Stakeholders
EBMgt Predictors	Functional behavior	*Attitude toward the EBMgt*
		Intention to use EBMgt
	Knowledge	*Managerial*
		Organizational
		Health care
	Key competencies and skill	*Key competencies and skill*
	Evidence sources	*Internal evidence*
		External evidence
	Evidence levels	*Levels of evidence*
	Uses of evidence	*Uses of evidence*
	Benefits	*Efficiency*
		Effectiveness
		Quality
	Government programs	*Regulations*
		Policies
		Plans
EBMgt Barriers	Managers' characteristics	*Absent criteria for selecting decision-makers*
		Few reward and incentive mechanisms
		Insufficient knowledge and negative attitude toward EBMgt
		Non-executive administration
		Lacking administrative and financial skills
	Decision-making environment	*Organizational value*
		Restricted perspective

		Situation of policy environment
		Lack of coordination
	Training and research system	*Lack of skill and competencies*
		Lack of communication with the scientific and research institutions
		Lack of specialization in hospital management
		Lack of evidence-based educations
	Organizational barriers	*Excessive bureaucracy and inappropriate structure*
		Organizational culture
		Limitation of financial and human recourses
		Lack of time
		Lack of teamwork
Evidence-based hospital management process	Asking	*Questioning*
		Translating
		Problems
	Acquiring	*Searching*
		Finding
		Source of evidence
	Appraising	*Validity and accuracy*
		judging
		Appraising
	Aggregating	*Arranging*
	Applying	*Decision-making process*
		Implementation
	Assessing	*Evaluation*

Figure 1: EBMgt theoretical framework (Center for Evidence-Based Management (CEBM))

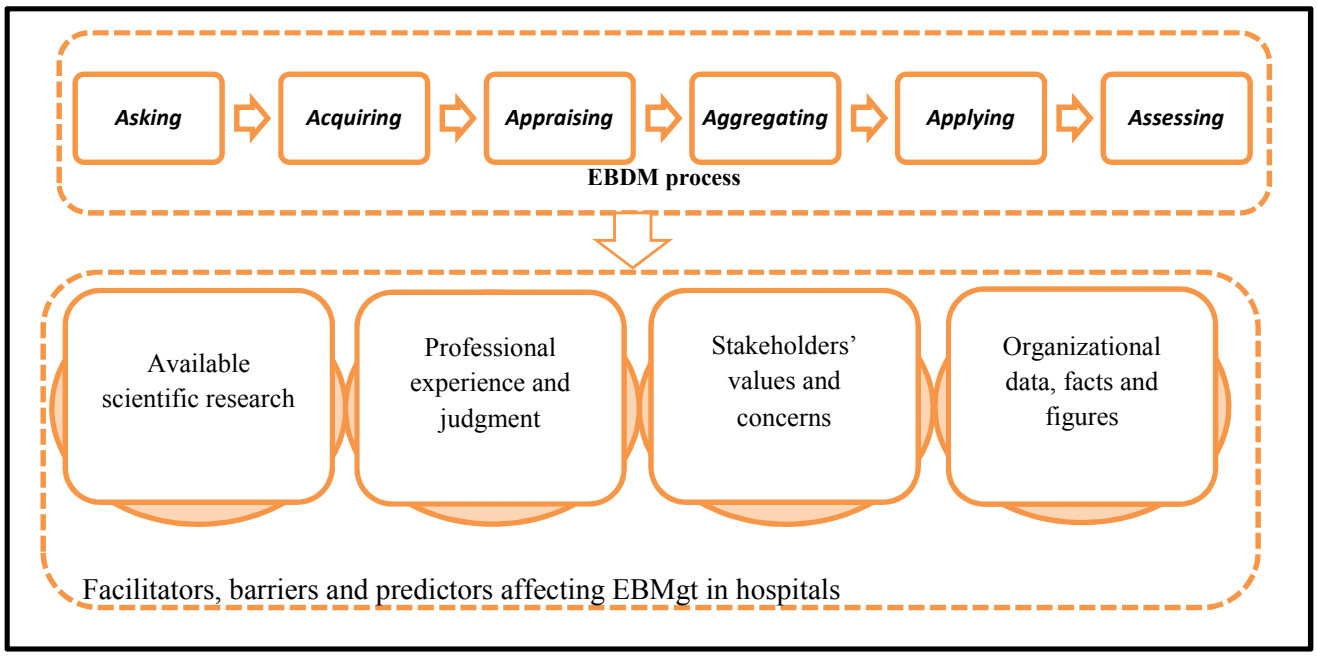

Figure 2. Evidence-based hospital management