Testing a Multisource Feedback Instrument in Healthcare Organizations

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ABSTRACT

In an evolving and challenging environment, healthcare organizations must ensure high levels of leadership expertise. A 360-degree feedback or multisource feedback instrument (MSF), including several leadership competencies, was submitted to seven healthcare organizations consisting of physician groups, clinics, and medical centers between 2010 and 2012. These assessments provided feedback from physicians and administrative leaders, and their manager(s), peers, direct reports, and stakeholders, totalling 3051 individuals, regarding the strengths and opportunities of physicians and administrative leaders for leadership development. The results also showed that managers tended to score physicians and administrative leaders lower than physicians and administrative leaders scored themselves.

Keywords360-degree or Multisource feedback assessment, leadership competencies, healthcare management, one-way within-subjects/repeated ANOVA

INTRODUCTION

Over the past few decades, the healthcare environment has evolved due to advances in technology, growing population, changing demographics, newly proposed business models and standards of care. Moreover, recent regulations, high cost of health care, difficulty in accessing care, and other ethical and legal considerations add more complexity to the healthcare sector. In this context, it is hard to know whether or not healthcare organizations possess sufficient leadership talent to tackle ongoing changes and challenges (Garman *et al.*, 2004; CCL®, 2011). The need for a 360-degree assessment for individuals in health systems arises from measuring the ability of behavioral competence independently of clinical competence (Dubinsky *et al.*, 2010). Using a 360-degree feedback instrument, the purpose of this study is to determine both various leadership gaps and level of agreement across different sources of ratings in healthcare organizations. Thus, the result of such an instrument provides information for policy formulations to support leadership development in healthcare organizations (Dubinsky *et al.*, 2010; Connors and Munro, 2001). There are two objectives in this study. The first one aims at identifying the strong and weak leadership competencies in healthcare organizations by a 360-degree feedback instrument using leadership competencies proposed in a previous study. This will, in turn, help further leadership development process that links the developmental needs of individuals (as input) to necessary skills, knowledge, attributes, and attitudes all of which are desired to be seen in individuals (as output) at various levels of the organization. The second one intends to compare the self-ratings to observer ratings to further investigate the level of congruence between the different sources of ratings at behavioral level where behavioral competencies are expressed by questions or items. Four hypotheses associated with the first objective and one other hypothesis associated with the second objective, totaling five hypotheses, are tested.

This paper is divided into six major parts. Section 2 contains two parts. The first part introduces the 360-feedback evaluation, discusses both its individual and organizational benefits, points out its challenges an organization should pay attention to before adopting their 360-feedback process. The second part discusses both leadership competencies and their assessment through the 360-feedback evaluation. Section 3 discusses the method, purposes 17 leadership competencies which are clustered under the four main components or domains, and frames the research hypotheses. Section 4 presents the results after running the two types of ANOVA designs. Section 5 is the conclusion which summarizes the results and discusses limitations and future research directions. The final section presents the concluding remarks.

360-DEGREE EVALUATION

Definitions, benefits, and challenges

360-degree employee evaluation or multisource feedback (MSF) is an instrument using the questionnaire-based assessment method to obtain feedback from an employee's subordinates, peers, supervisor(s), and interested stakeholders, as well as a self-evaluation (Garman *et al.*, 2004). It gained considerable popularity at the beginning of the 1990s in the workplace and was widely used to assess performance in both industrial settings and health systems (Bracken *et al.*, 2001; Wood *et al.* 2006). The main goal of MSF is to check a person's behavioral competencies from different perspectives, including those at the same, higher and lower levels in the organizational chart. Thus, the combination of all these perspectives helps to construct a more complete picture of performance and enhances the credibility of the collected information (Lockyer, 2003). This constructed big picture is used to give feedback to the individual regarding his/her strong and weak competencies by an intermediary mentor or supervisor (Hazucha et al., 1993; Garavan *et al.* 1997). Furthermore, the feedback received by the individual enhances his/her self-awareness which is an initial and essential step in individual career development process (McCarthy and Garavan, 1999).

In addition to the individual benefits, using 360-degree employee evaluation or 360-degree feedback assessment will ensure organizational benefits. Some organizational benefits are: 1) employee involvement by allowing the employee to comment about his/her team members (Garavan *et al.* 1997), 2) the increasing competitive advantage by including the internal and external customer views to evaluate the relationship between the leadership behavior and different work units, thus obtaining this view will enable the work unit to better anticipate customer needs to develop unique products and services for them (London and Beatty, 1993), 3) culture change by an intent either to make an actual improvement in the organizational culture (O'Reilly and Furth, 1994) or to give an impression of openness and participation to the clients, even if this is not the part of the organization's culture (Waldman *et al.*, 1998), 4) team effectiveness by providing a behavioral feedback among team members in order to increase the effective team behavior and the level of trust and communication (Dominick *et al.*, 1997; Waldman *et al.*, 1998), and 5) feedback for training needs and effectiveness by conducting the 360-degree feedback before and after the training (Rosti and Shipper, 1998). On the contrary to these individual and organizational benefits, there are several important challenges that need to be considered before an organization adopts the 360-degree feedback process (McCarthy and Garavan, 1999; Wood *et al.* 2006). These challenges are the following:

- The purpose of 360-degree feedback must be clear to all participants, i.e., the distinction between the developmental use of 360-degree feedback and its use in decisions which affect the participant's career must be clearly communicated. Stakeholders must also be communicated to gain their commitment to the new 360-feedback system.

- The raters should be given an opportunity to observe the ratee's various behaviors, to perceive the ratee's performance, and to assess the needs for improvement in the ratee's observed behavior and performance.

- Both the raters and ratees must be trained from the design stage through to implementation, i.e., the raters need to be trained to overcome the rating errors such as central tendency, halo and leniency effect.

- The raters' answers must be kept private and confidential. Nobody should feel threatened by the 360-degree feedback process. However, if the answers are used for managerial decision making, the privacy and confidentiality of the answers might be problematic.

- The senior management must support the 360-degree feedback process and they must encourage all other managers in giving and receiving the feedback.

Leadership Competencies

According to definition in Northouse (2013), leadership is the process whereby an individual influences and

stimulates a group of individuals to achieve a commonly shared goal. In this context, the role of leaders is essential to the success of any organization because a leader enables the organization to achieve its stated goal, even to grow outside of its existent boundaries (Schwartz and Pogge, 2000). Leadership competencies are used as means of articulating the organizational values and objectives. Then, the competency framework approach using leadership competencies describes the management or leadership roles and puts them into a framework for measuring, monitoring, comparing and regulating the behavior of leaders. Therefore, a competency framework simply becomes a representation of different leadership elements in an organization (Bolden and Gosling, 2006).

The definition of complex adaptive systems may best define the operations occurring in the healthcare system of the 21st century (Plsek and Greenhalgh, 2001; Plsek and Wilson, 2001). A complex adaptive system is the system in which a collection of individual agents with freedom acts in a way that their actions and behaviors are not always totally predictable and interconnected, thus one agent's action and behavior will change the context for other agents (Plsek and Greenhalgh, 2001). A colony of termites, the financial market, the immune system, medical data such as medical record of patients and their interpretation, different processes in hospitals such as maintenance management and bed allocation, any collection of humans such as a family, a committee, a healthcare team might be the best examples of complex adaptive systems (Plsek and Greenhalgh, 2001; Shanmugam, 2009; Vich *et al.*, 2009; Jerbi and Kamoun, 2010;Lu and Segall, 2013). McAlearney (2006) stated that this complexity in the healthcare industry stemmed from two principal factors: environmental and organizational. Environmental factors are mainly a myriad of governmental regulations that are out of the healthcare organization's control for the most of time. Organizational factors are the multiple hierarchies of professionals on both clinical and administrative sides of the organization which generate challenges for leadership in both directing the organization and coordinating the workplace. As a result of these complexities, the healthcare organizations must possess sufficient leadership talent to deliver healthcare in a more efficient and effective way. Otherwise, traditional roles in healthcare management at any professional level will be inadequate in the evolving and challenging healthcare environment (Guo, 2003; Garman and Scribber, 2011).

It is highly expected that improvement in the professional competence of individuals providing healthcare services will improve the overall quality of care experienced by the user of healthcare system (Dubinsky *et al.*, 2010). Professional competence is a complex construct, mainly consisting of three dimensions: management, behavioral, and organizational (Bolden and Gosling, 2006). Management (or technical/functional) competencies are primarily dependent on functional analysis of job roles to determine the expected standards of workplace, for example the ability to perform medical procedure, the number of procedures performed and adherence to procedural guidelines (Bolden and Gosling, 2006; Dubinsky *et al.*, 2010). Behavioral competencies are interpersonal and affective skills such as the ability to communicate effectively, judgment relationship management, and empathy in managing relationships (Dubinsky *et al.*, 2010). Organizational (or strategic) competencies are more tied to organization and business process which leads to enhanced innovation, learning and performance (Bolden and Gosling, 2006). Measuring the gaps in behavioral competencies and improving those in healthcare organizations is crucial in the sense that behavior of a complex system emerges from the interaction among the agents residing in the system (Plsek and Greenhalgh, 2001).

In healthcare, there have been several studies that have proposed a different set of competencies for physicians (Schwartz and Pogge, 2000; Swing, 2007; Chaudry *et al.*, 2008), nurses (Cummings *et al.*, 2008), healthcare managers (Guo, 2003; Stefl, 2008), both academic and practitioner programs to identify strengths and gaps in curricula and training programs (Verma *et al.*, 2006; Robbins *et al.*, 2009), students and early-careerists for their career planning and competency development in the presence of guidance from their mentors (Robbins *et al.*, 2009), leadership in quality efforts (Garman and Scribner, 2011), and 360-degree feedback studies (Lockyer, 2003; Joshi *et al.*, 2004; Lurie *et al.*, 2009; Garman *et al.*, 2004; Verma *et al.*, 2006; Wood *et al.* 2006). In healthcare organizations, the competency framework is used to align practitioners, learners, teachers, and patients with evidence-based practices such as using developmental assignments, creating job rotations, and tying development to performance evaluations like 360-degree assessment, all of which intends to strengthen organization's leadership (McAlearney, 2006; Verma *et al.*, 2006). As reported in the results of a qualitative study performed by McAlearney (2006), leadership development programs affect the organization's overall effectiveness by means of improvement in employee motivation, decline in turnover rates, and an increasing organizational resilience to change. On the contrary to

the easiness of measuring functional competencies that are usually quantifiable in nature (such as the number of procedures performed), 360-degree feedback assessment can be used to measure the behavioral competencies, which are usually presented as a form of model called a leadership competency model in several studies, in order to identify the strong and weak competencies in healthcare organizations (Lockyer, 2003; Garman *et al.*, 2004; Verma *et al.*, 2006; Wood *et al.*, 2006; Dubinsky *et al.* 2010). In addition, Garman (2011) stated that competency models could only be powerful facilitators and guidance for individual change as long as they were incorporated into leadership development programs; otherwise by themselves these models would scarcely help individuals develop. This study incorporated the modified version of an existing competency model that is proposed by Garman et al. (2004) into leadership development programs run in seven healthcare organizations. The existing competency model was specifically developed to be used in 360-degree feedback instruments in order to support the leadership development in healthcare administrations. However, the 360-degree feedback instrument containing leadership competencies found in this study has not been implemented in any leadership development program, yet. Before the implementation, using this existing competency model as a reference, some questions determining the leadership competencies were either updated or newly added based on organization needs. The results obtained from the instruments provided leaders with feedback on their strong and weak leadership competencies and were also used to design the most appropriate leadership development programs for the organizations, which specifically intend to improve the weak competencies as a main focus.

METHOD

Sample

A hundred fifty five physicians and administrative leaders (assessees), and their related assessors (164 managers, 933 peers, 963 direct reports, and 836 stakeholders, totaling 3051 individuals) were surveyed in seven healthcare organizations using a 360-feedback instrument. Two organizations received the instrument for two separate leadership study groups. Managers (one or more) were those who held departmental leadership or executive committee membership. Peers (seven to ten) were the colleagues who were in a position similar to the assessees' position. Direct Reports (seven to ten) were employees or others who supported the assessees' work. Stakeholders (seven to

ten) were those who had a stake in the organization; in other words, those who seek for higher priorities in the consideration of their wants, needs, claims, and demands (e.g. referring physicians, board members, professionals in outside organizations, etc.). The following table shows the breakdown of participants in terms of different organizations.

Table 1: The number of participants from different organizations

	physicians and administrative leaders	Managers	Peers	Direct Reports	Stakeholders
Organization 1	8	17	15	26	21
Organization 2	13	17	94	98	78
Organization 3	17	0	106	95	82
Organization 3_2	16	24	80	94	74
Organization 4	18	19	117	120	103
Organization 5	21	23	125	113	113
Organization 6	25	25	119	125	130
Organization 7	18	18	154	141	108
Organization 7_2	19	21	123	151	127
Total	**155**	**164**	**933**	**963**	**836**

Note: 360-degree assessment was performed for two separate study groups in two organizations. In one organization, managers were not participated in 360-degree assessment. Global average scores (see section 4.1) were completed by mean imputation method to maintain the balance design for further statistical analyses.

360-degree assessment instrument and research hypotheses

In our study, we used a 360-degree feedback instrument including validated competencies proposed in the study conducted by Garman *et al.* (2004). To the extent of our knowledge, this study was the first to specifically and broadly explore the development of multisource feedback instrument in healthcare settings, and also it was the best match-up with the purpose of our study. Some questions (i.e., behaviors) determining leadership competencies from these previously constructed frameworks were either modified based on feedback obtained from the seven healthcare organizations or newly added using critical incident technique (CIT) via the help of subject matter experts (e.g., leadership development consultants and administrative fellowship supervisors) (Garman *et al.*, 2004). CIT is defined as a set of procedures for systematically identifying human behaviors that contribute to success or failure of individuals in specific situations. Critical incidents can be determined by asking the respondents to tell a story about an experience they have had (Flanagan, 1954). As a result, we have organized the leadership

competencies and their associated behaviors around four leadership domains because these four domains best described our leadership competencies including both those newly added and modified questions. The names of these four domains are: Leading with strategy (LS), Leading people (LP), Leading for results (LR), Leading yourself (LSe). Each domain has several different leadership competencies and each competency is determined by certain questions which indicate specific behaviors. Sixteen competencies associated with these four domains are shown in Table 2. Each competency is discussed by some bullet points, which are associated with related questions in the instrument. In the literature, we realized later that there was a study conducted by Garman and Scribner (2011), which already identified some of our newly added or revised competencies such as business and financial perspective, customer and quality focused, and strategic decision making.

The competencies in Table 2 were clustered by the intention of matching with 4 domains in transformational leadership (TL) theory. Burns (1978) first introduced the concept of transformational leadership and defined leadership as either transactional or transformational. Bass (1985) extended the work of Burns (1978) and conceptualized both types of leadership across six components (two for transactional and four for transformational) under a Multifactor Leadership Questionnaire (MLQ) (Bass and Riggo, 2006; Avolio *et al.*, 1999). Transactional leaders are those who have an exchange-based relationship with their followers, such as politicians exchanging jobs for votes and managers offering rewards or punishing deviations from standards. On the other hand, transformational leaders are those who both stimulate and inspire followers not only to achieve extraordinary outcomes in changing environments, but also to develop their own leadership capacity (Bass and Riggo, 2006; Kirkbride, 2006). Four components of TL are as follows (Bass and Riggo, 2006):

- *Inspirational motivation* (IM) is the degree to which a leader gets followers involved in envisioning future states and strategies, in other words, a leader articulates a compelling vision of the future.
- *Individual consideration* (IC) is the degree to which a leader cares each follower's needs, listens to the followers concerns, and acts as a mentor or coach for their achievement and growth.
- *Intellectual stimulation* (IS) is related to the leaders' ability to encourage creativity in their followers and how much a leader inspires the followers to look at challenges from different angles.
- Idealized influence (II) is the degree to which a leader serves as a role model for high ethical behaviors that will be emulated by the followers.

The definition of 4 domains in TL theory partially matches up with each competency clustered under four domains. For example, the competency 'Leading Change and Innovation' was clustered under the domain 'Leading with strategy' which was intended to refer to the domain 'IM' in TL theory. However, this competency really corresponded to the domain 'IS'. In addition, the competencies under the domain 'Leading for results' did not match up with any definition of 4 domains in TL theory. A future study should be performed to investigate the comparison between the domains we proposed and the domains in TL theory.

As noted in the components of TL theory, it is important that leaders articulate a clear vision of the future to their followers and encourage creativity in them because this empowers the followers so that they can enact the vision (Westley and Mintzberg, 1989, Porter-O'Grady and Malloch, 2007). Creativity which is the ability to produce the novel and useful ideas happens mainly due to the individuals' effort (Mclean, 2005). On the other hand, these individual efforts need to be successfully implemented in a group level to create innovation (Mclean, 2005, Amabile 1996). For example, Scott and Bruce (1994) found that the quality of relationship between leaders and their followers is positively related to innovative behavior of the followers. By articulating a clear vision, leaders can encourage their followers' individual and joint efforts towards innovative work process and outcomes (Amabile 1996). Innovation brings change which in turn necessitates an adaptive leadership envisioning the future opportunities. Kotter (1995) stated that change supported by a clear vision required creating a new system, and therefore always demanded leadership. In other words, one of the important steps in change process is to establish a clear vision that is for clarifying the direction in which an organization needs to move; thus, a 360-degree assessment for performance evaluations will be more meaningful to employees (Kotter, 1995, Garman *et al.*, 2006). Yukl *et al.* (2002) also categorized both the behaviors 'articulating a clear vision' and 'encouraging innovative thinking' under change-oriented leadership domain (other domains were task-oriented and relation-oriented). In healthcare, as stated by Garman *et al.* (2006), establishing a compelling vision and making

Table 2: Leadership competencies under four domains

Leading with strategy (LS)

1. **Business and Financial Perspective**
   - A leader should applyanin-depth knowledge of business and health care issues and best practices to create high-impacts trategies, and identify and maintain the focus on key success factors
   - A leader should accurately identify the potential financial impact of various strategies and actions, and both setarealistic budget and controlit.

2. **Clear Vision, Engagement, and Goal Alignment**
   - A leader should create, communicate, and enroll others in a compelling vision with a clear picture of an ideal future state that inspires others.
   - A leader should buildbuy-in, engagement, and ownership for the organization's vision with key stakeholders.
   - A leader should clearly set and communicate the organization's vision and goals and ensures that team member goals align with organizational vision and goals.

3. **Leading Change and Innovation**
   - A leader should challenge established ways of doing things.
   - A leader should propose and lead the implementation of change initiatives that challenge the status-quo, and target the improvement of organizational capabilities.
   - A leader should develop and implement new initiatives and ideas that improve the performance of the organization by encouraging the exploration of creative and non-traditional ideas from team members.
   - A leader should create a team climate that encourages experimentation and prudent risk taking.

4. **Strategic Decision Making**
   - A leader should collect and use the relevant data necessary to make good decisions, but should not delay decisions because 100% of the information is not available.
   - A leader should takes personal responsibility for making, communicating, and implementing the "hard" decisions, and make good decisions under time pressure, uncertainty, or stress.

Leading people (LP)

1. **Building Relationships and Trust**
   - A leader should respond sensitively too thers' concerns and develop trust and credibility by acting in a consistent, genuine manner.
   - A leader should create an environment of trust where ideas, opinions, and knowledge are shared freely.

2. **Coaching and Performance Development**
   - A leader should provide team members with advice, feed back and support for development.
   - A leader should handle performance problems with respect for others, and take appropriate and timely corrective action when needed.
   - A leader should use recognition effectively and frequently expresses appreciation to others for their efforts.

3. **Communication and Influence**
   - A leader should verbally express ideas clearly and concisely, and keep all team members and stakeholders informed on key issues.
   - A leader should listen attentively too thers'perspectives and needs, and actively seek the ideas and opinions of others.
   - A leader should motivate and influence others, even when not in a position of authority.

4. **Teamwork and Collaboration**
   - A leader should work collaboratively with the team by applying the talents and skills needed to accomplish goals.
   - A leader should encourage a strong, inclusive team spirit through the recognition of others, and celebrate the success of others.
   - A leader should consistently share credit with others on the team.

5. **Managing Conflict**
   - A leader should focus on the issue and not the person when resolving conflict.
   - A leader should negotiate with others to achieve win-win solutions.
   - A leader should work to reduce unnecessary conflict, and shy away from surfacing problems that must be resolved

Table 2: Leadership competencies under four domains continues

Leading for results (LR)

1. **Planning, and Time and Resource Management**
    - A leader should systematically plan a course of action and ensures accomplishment of designated goals.
    - A leader should create and communicate plans with clear goals, actions teps, accountabilities, resourcere quirements, and timelines.
    - A leader should complete critical activities in a timely manner, and identify and mobilizes resources needed to getthings done.

2. **Quality Focused**
    - A leader should passionately pursue the continuous improvement of clinical or operational processes and services.
    - A leader should support an environment and culture of quality and continuous improvement focus on the patient satisfaction andthe quality of patient care.
    - A leader should generate and share best practices for optimizing clinical and operational performance.

3. **Customer Focused**
    - A leader should demonstrate a clear sensitivity to customers' (e.g., patient, family, referring physicians) needs.
    - A leader should continuously look for ways to exceed customer expectations.
    - A leader should engage in measuring and assessing customers atisfaction.

4. **Driving Results**
    - A leader should set high performance expectations for the team and for individual team members.
    - A leader should consistently complete critical activities and goals in an efficient manner and fulfill on commitments.

Leading yourself (LSe)

1. **Integrity**
    - Consistently exhibits the highest level of ethical standards and responsibility to the department, team members, and the community.
    - Is dependable and reliable – follows through on commitments and delivers on promises to others.
    - Personally models the organization's values and desired behaviors.
    - Holds him/herself accountable for solving problems and getting results; does not pass on blame to others.

2. **Adaptability**
    - Adapts quickly to new situations and requirements.
    - Displays flexible thinking and openness to new ideas.
    - Works effectively with people with different styles and personalities.

3. **Energy and Optimism**
    - Displays a high energy level and for getting things accomplished, and maintains control and composure during periods of stress and rapid change;
    - Demonstrates an infectious optim is mandambition, even in the face of challenges and obstacles.
    - Deals comfortably with the expression of emotions in others. (Senses subtle shifts in mood and tone in conversation and makes appropriate adjustments to support constructive dialogue when emotions are high).

everyone aware of it is one of the most central competencies to become an effective leader. Additionally, different leadership styles in healthcare impacts team innovation through the mediating effect of team reflection that is defined as "the extent to which team members (i.e. followers) collectively reflect upon the team's objectives, strategies and processes" (Somech, 2006). Then, the first hypothesis of this study is:

H1: Leaders in healthcare should focus on improving their skills more in establishing a clear vision of the future and communicating the vision to their followers, and ensuring that the followers' goals align with the established vision and leading the implementation of change initiatives by encouraging the exploration of creative ideas from team members, which will impact innovation.

One of the main leadership tasks is to coordinate the followers and facilitate their relationships and interactions at every organization level (Porter-O'Grady and Malloch, 2007).Since many organizations replaced their traditional hierarchal management structures with empowered (semi-autonomous or self-managing) work teams, the leader's role and responsibilities in those

empowered environments should be redefined, which lead to a corresponding change in the types of leadership behaviors or roles leaders employ (Arnold *et al.*, 2000). Srivastava *et al.* (2006) found that empowering leadership was positively correlated to team performance through knowledge sharing and team efficacy. Coaching and providing growth and development are the important subsets of a leader's role (Ellinget and Bostrom, 1999). Coaching is defined as 'a process of empowering employees to excess prior levels of performance' (Ellinget and Bostrom, 1999). Coaching includes behaviors making suggestions to (i.e., advices and feedbacks) team members about their performance improvements and using recognition effectively and frequently expressing appreciation to the team members for their efforts in order to make them self-reliant (Arnold *et al.*, 2000). Yukl (1971)'s study mentioned a leadership competency called 'consideration', which was defined as 'the extent to which a leader acts in a warm and supportive manner and shows concern and respect for his subordinates'. From this viewpoint, leaders must be able to implement a conflict resolution between team members successfully after listening to both sides. Jehn and Mannix (2001) defined 'relationship conflict' as 'an awareness of interpersonal incompatibilities such as feeling tension and friction among team members' and found that low level of relationship conflict was associated with higher team performance. In healthcare, leadership competencies associated with interpersonal relations such as coaching and conflict resolution was incorporated into many leadership competency model (Guo, 2003, Garman, *et al.*, 2006, Stefl, 2008, Calhoun *et al.*, 2008). Then, the second hypothesis of this study is:

H2: Leaders in healthcare should concentrate on improving their skills more in providing followers with advice, feedback and support for their performance development and working to resolve the unnecessary conflicts between their followers.

Strategic planning is essential in current healthcare environment (Schwartz and Pogge, 2000). For this, a leader should be knowledgeable about the different environments such as the macro environment, the industry environment, the competitive environment, and the internal organization environment. Thus, a leader quickly processes and analyzes the information coming from the environment, formulates workable plans for ongoing problems, and translates those plans into tactic that should be well understood by the followers, which will in turn provide to adapt to the constantly evolving and complex environment in order to make quality decisions (Schwartz and Pogge, 2000;

Boal and Hooijberg, 2006). Moreover, Plsek and Wilson (2001) stated that in order to make quick responses in the complex environment, minimum specifications including critical activities would yield more natural creativity embedded in the organization than detail plans. To be able to reach the desired results, a systematically planed course of action by a leader requires identifying and mobilizing resources needed to get things done, setting high performance expectation of the team members, and completing the critical activities in timely and efficient manner. For example, Ulrich *et al.* (1999) proposed that result-oriented leadership was always overlooked and effective leaders should always connect leadership attributes to results such as patient satisfaction; in other words, a leader should learn how to act both in a such a good way (e.g., capable of possessing the desired leadership attributes) and in ways that ensure results. Then, the third hypothesis of this study is:

H3: Leaders in healthcare should concentrate on improving their skills more in creating and communicating a plan including clear goals, action steps, accountabilities, resource requirements, and timelines to their followers in order to be able to reach the desired results.

The feelings (i.e., moods and emotions) influence the leadership effectiveness (George, 2000). For example, Humphrey (2002) proposed that one of the most important emotions for leaders to manage on their followers is optimism. Hence, feelings of optimism in followers have a substantial influence on their performance. Furthermore, leaders must have high level of energy and be generally active, lively, and often restless to sustain a high achievement drive (Kirkpatrick and Locke, 1991). Then, the fourth hypothesis of this study is:

H4: Leaders in healthcare should concentrate on improving their skills more in managing emotions on their followers and demonstrating optimism when facing obstacle and challenges.

The lack of agreement between different sources of ratings in 360-degree assessment is to be expected (London and Beatty, 1993). When this expectation comes alive, an individual's self-awareness and motivation can be enhanced because the individual can be stimulated as a result of 360-degree assessment due to the fact that the individual will be provided with feedback of discrepancies between different sources of ratings (London and Smither, 1995). The common practice in many programs using 360-degree evaluation is to use self-ratings as the sole benchmark for comparisons with other sources of ratings (Wood *et al.* 1999). Studies investigating the relationship

between self-ratings versus ratings by others (or observer's ratings) showed that self-ratings were more inflated (Carless. at. al. 1998). Furthermore, post-hoc multiple comparisons results in Atkins *et al.* (2002)'s study also showed that supervisor ratings were significantly lower than self-ratings. Even though Atkins *et al.* (2002)'s findings powerfully suggest that the common practice of the comparison self-ratings to observer's ratings should be questioned, the fifth hypothesis of this study:

H5: It is highly expected in healthcare organizations that self-ratings are higher than other's ratings (or more inflated), when different sources of ratings in 360-degree assessment are compared.

DATA COLLECTION PROCEDURE

Between 2010 and 2012, an instrument, called the leadership success profile (LSP) checklist, was submitted to seven healthcare organizations to construct a leadership success profile that defined the organizations' leadership standards and criteria. The LSP checklist included both key leadership competencies and their associated behaviors (questions), which were critical for successful leadership in a specific organization. The LSP checklist used the validated competencies found in the study conducted by Garman *et al.* (2004) as baseline competencies. Using interviews carried out during CIT procedure, not only did we modify the questions in the LSP checklist determining leadership competencies from this previously constructed framework based on feedback obtained from the seven healthcare organizations, but we also added the new questions. Thus, a final LSP checklist improved its functionality in terms of both feedback obtained from seven organizations and those newly added questions. Once an organization's LSP was constructed based on the LSP checklist results, it was used in a 360-degree feedback instrument which was submitted back to these seven healthcare organizations.

Two organizations requested an extra feedback instrument to execute the study for two additional groups of assessees, which accounted for nine different feedback instruments sent. However, five organizations only received the feedback instrument for the domain 'leading yourself'. All answers to questions in the feedback instrument used 7-point Likert scale ranging from extremely high to extremely low. The number of questions asked for a competency in each feedback instrument was determined based on feedback obtained from the organization. Therefore, the number of questions asked for a competency was sometimes different across seven organizations. To overcome this

difference and simplify our statistical analysis, global average ratings or scores of competencies in different source of ratings were calculated. First, assessees' ratings (i.e., self-ratings) per question in an organization were averaged. Second, for the same organization, since there were more than one manager, peer, direct report, and stakeholder, their ratings per question for the related assessee were averaged, thereby finding aggregated ratings of assessors per question for the related assessee. Third, these aggregated ratings of assessors per question were also averaged. Finally, for each source of ratings, these averaged self-ratings per question and averaged aggregated ratings of assessors per question, both of which are associated with the same competency, were averaged to obtain a global average score for each competency. For example, one organization received a feedback instrument consisting of 57 questions each of which was associated with a competency. This instrument was filled out by 18 assessees. Each assessee determined in advance which peers, direct reports, and stakeholders filled out the instrument with regards to him/her. For each assessee, a managers (sometimes two), a different number of peers, direct reports, and stakeholders filled out the instrument. First, ratings from 18 assessees per question were averaged. Second, for each assessee, ratings from multiple managers, peers, direct reports, and stakeholders per question were averaged to find the aggregated ratings. Third, these aggregated ratings of assessors per question were averaged. Thus, we obtained 57 averaged self-ratings and 57 averaged aggregated ratings for managers, peers, direct reports, and stakeholders. Finally, from these 57 averaged ratings, the ratings associated with the same competency were also averaged to obtain a global average score for each competency. These global average scores for each competency were used for further statistical analysis.

RESULTS

Identifying strong and weak competencies

To identify strong and weak competencies, differences in the mean level of global average scores between the competencies of a leadership domain were analyzed by means of both one-way ANOVA w/blocking design or one-way within-subjects ANOVA and descriptive statistics. In one-way within-subjects ANOVA, the means that are tested are derived from the same subjects (blocking effect) measured on different occasions (treatments) rather than from different groups of subjects on different occasions (Tabachnick and Fidell, 2007). In our analysis, the same organizations (blocking

effect) were measured on different competencies (treatments). Each leadership domain has five different sources of ratings, totaling 20 different data sets. In a few datasets, some treatments have the missing values in the blocking effect, meaning that some competencies are not measured in some companies. In order to maintain the balanced design, the method of mean imputation was used to replace these missing values. With this method, the missing values of a competency were filled in by the average value of observed cases (e.g. Global Average Scores) of that competency (García-Laencina *et al.*, 2010). The one-way ANOVA w/blocking design was separately run for each source of ratings such as self-ratings, managers, peers, direct reports, and stakeholders. Tables 3a&b, 4a&b, 5a&b, and 6a&b show the descriptive statistics, the one-way ANOVA w/blocking results, and confidence intervals obtained from multiple comparison tests for each competency of a leadership domain. All analyses were performed using the Statistical Analysis System (SAS) version SAS/STAT 9.3 (SAS Institute Inc., 2011). For domains LS, LP, LR, and LSe, R-squares for each source of ratings varied in the range 0.73-0.96, 0.80-0.89, 0.79-0.91, and 0.89-0.98, respectively. R-square indicates that the models for each source of ratings accounts for above 79% of the variation in the ratings for competencies. For all domains, global p-values for each source of ratings were statistically significant, meaning that the models run for each source of ratings as a whole account for a significant portion of the variation in ratings for the competencies, and that we can proceed to evaluate the tests of effects. The models run for each source of ratings in all four domains had the statistically significant p-values for blocking effects, indicating that the blocking was necessary. Degrees of freedom for blocking effect was 8 (DF = 9-1), which referred to nine different 360-degre feedback instruments sent to seven healthcare organizations. In addition, the models run for each source of ratings in all four domains have statistically significant p-values for treatment effects, indicating that at least one of the competencies' mean levels differed from the rest of the other competencies' mean levels. The mean comparison method can be used to reveal more information about the nature of differences. We used Tukey-Kramer's method because it was designed to examine all possible pairwise comparisons, and it was more powerful than the other methods designed for the pairwise comparisons (SAS Institute Inc., 2011).

For domain LS, across all sources of ratings except self-ratings, confidence intervals (CIs) in Table 3b indicated that the competency 'Leading Change and Innovation (3)' significantly received the lowest ratings

when compared to the other competencies such as 'Business and Financial Perspective (1)' and 'Strategic Decision Making (4)' which already had higher mean values (i.e., global average scores) than the competency '3'. In addition, the competency '3' obtained the lowest mean values across all sources of ratings except self-ratings in which it still had the second lowest mean value (see Table 3a). On the contrary, for self-ratings, we only observed the statistically significant difference between the competency 'Clear Vision, Engagement, and Goal Alignment (2)' and 'Strategic Decision Making (4)' at the 0.1 significance level. Moreover, the competency '2' had the lowest mean value in self-ratings. In sum, while self-ratings indicate that the competency '2' needs an improvement, other sources indicate that the competency '3' requires more an improvement. Therefore, we paid more attention to these competencies in designing a leadership development program for the healthcare organizations. Even though we obtained different results from two perspectives (e.g., self and others) these two competencies are really dependent on each other (Kotter, 1995). Furthermore, these two competencies are two properties mentioned in the quantum leadership paradigm, which basically defines the leadership roles as the ability of handling chaos and complexity in the process of anticipating and planning for the future and the awareness of the interdependency of processes, actions, behaviors, and functions while dynamic changes occur (Porter-O'Grady and Malloch, 2007). First property of the paradigm is that healthcare leaders must be able to establish their vision and communicate it to their followers by reading the signposts which are the evidence of an imminent change, possible directions of the change, and elements indicating its fabric (Porter-O'Grady and Malloch, 2007). Second one is that healthcare leaders must have 'innovation leadership' skills which make a continual adaptation to the changing environment and also lead the change initiatives by encouraging the exploration of creative ideas from team members (Porter-O'Grady and Malloch, 2007).

For domain LP, across all sources of ratings, CIs in Table 4b showed that the competency 'Coaching and Performance Development (2)' had the lowest statistically significant ratings when compared to the other competency 'Building Relationships and Trust (1)' which had the highest mean value. Furthermore, the competency '2' scored the lowest mean values across all sources of ratings except stakeholders in which it still had the second lowest mean value (see Table 4a). The difference between the competency 'Managing Conflict (5)' and the top performer, the competency

'1', was statistically significant across all sources of ratings except direct reports in which it still had the second lowest mean value, and the competency '5' was the second lowest ratings across all sources of ratings except stakeholders in which it had the lowest value. For self-ratings, the competency '1' was the top performer, meaning that the difference between the competency '1' and all other competencies were statistically significant. In summary, from descriptive statistics, we can say that the competency '2' needs an improvement because it had the lowest mean value by all sources except stakeholders, even in stakeholders this competency statistically received lowest ratings when compared to the top performer competency 'Building Relationships and Trust (1)'. The competency '5' can also be treated as the competency which generally received lowest ratings across all sources, therefore it requires an improvement. Therefore, it was paid more attention to the competencies '2' and '5' in designing a leadership development program for the healthcare organizations. These competencies are the relation-oriented competencies or interpersonal competencies that reside in the interaction between an individual and the social and organizational environment (Yukl *et al.*, 2002, Day, 2001). These two competencies can be improved by an integration strategy whereby an individual will learn how to relate to others, build commitments, and develop extended social relationships (Day, 2001).

For domain LR, across all sources of ratings, CIs in Table 5b indicated that the competency 'Planning, and Time and Resource Management (1)' significantly received the lowest ratings when compared to the other competencies such as 'Quality Focused (2)' and 'Customer Focused (3)' which already had higher mean values than the competency '1'. In addition, the competency '1' obtained the lowest mean values across all sources of ratings (see Table 5a). The difference between the competency 'Customer Focused (3)'' and 'Driving Results (4)' were also statistically significant across all sources of ratings. Furthermore, the competency '4' had the second lowest mean value across all sources of ratings. In summary, the competencies '1' and '4' needs an improvement. Thus, it was paid more attention to the competencies '1' and '4' required in designing a leadership development program for the healthcare organizations.

For domain LSe, across all sources of ratings except direct reports, CIs in Table 6b indicated that 'Integrity (1)' significantly received the highest ratings when compared to the other competencies 'Adaptability (2)' and 'Energy and Optimism (3)'. Furthermore, the competency '1' had the highest mean value across all

sources. Although the competency '3' had the lowest mean value across all sources of ratings, the only difference between the competency '2' and '3' that was statistically significant occurred in self-ratings. Then, from only the assessees' perspective, the competency '3' could be counted as the competency that significantly received the lowest ratings, and thus, it was paid more attention to this competency in designing a leadership development program for the healthcare organizations. In contrast, integrity was found as the top performer from all perspectives. Integrity is defined as the consistency of words and actions (Palanski and Yammarino, 2009). One reason that integrity was rated high by all sources is that even though words shaped by personal moral standards can be profoundly influenced by the structure (i.e., a compensation system) and norms (i.e., severe social sanctions) in an organization, actions performed by each individual in the organization will be aligned with the company's standards (Morrison, 2001; Palanski and Yammarino, 2009).

Determining the congruence between different sources of ratings

Using the repeated measures ANOVA design, our approach was to analyze the differences in the mean levels of average ratings to the questions for each competency between the different sources of ratings, such as assessees and assessors. The repeated measures ANOVA is the extension of the paired t-test and tests the differences in mean values either under three or more conditions or across repeated groups. In both cases, the same subject is measured (Pallant, 2010). Before running the repeated measures ANOVA design, the questions, each of which was associated with the same competency from nine 360-degre feedback instrument, were merged one under another; thus, a list of all questions asked for the same competency from these instruments were gathered together. This process of merging was performed for both the assessees and assessors. For example, there were 24 questions asked for competency 'Business and Financial Perspective (1)' across all instruments. A data set consisting of the averaged self-ratings and averaged aggregated ratings of assessors both of which were related to 24 questions was compiled (i.e., a data set in 24x5 dimensions was constructed by this merging procedure). Since there were 16 competencies, a separate data set was compiled for each of these 16 competencies. For the repeated measures ANOVA design, while the questions were treated as the same subject measured, the different sources of ratings were treated as different conditions. The main reason to run

the repeated measures ANOVA at question level was due to the fact that the number of questions asked for a competency was sometimes different across seven organizations. As a result, this approach allowed us to investigate the congruence between different sources at behavior level.

The repeated measures ANOVA was run for each of these 16 competencies. All analyses were performed using IBM SPSS Statistics for Windows, Version 21.0. (Armonk, NY: IBM Corporation). When we run the repeated measures ANOVA we must assume sphericity. Sphericity means that all differences between pair of scores be equally variable. A specific form of sphericity is compound symmetry which requires the equality of variances and covariances (Girden, 1992). Mauchly'ssphericity test checks the compound symmetry property by examining the form of the common covariance matrix (Lomax and Hahs-Vaughn, 2012). The common covariance matrix must be spherical (i.e, the assumption of sphericity is met), if the Chi-square approximation by Mauchly's criterion has an associated p-value higher than the alpha level. Then, we fail to reject the null hypothesis that is the equality of variances and covariances (Girden, 1992; Lomax and Hahs-Vaughn, 2012). Otherwise, the assumption of sphericity is violated and the F-ratio used in ANOVA is positively biased, thus null hypothesis were rejected too often. When the assumption sphericity is violated, different correction domains (Greenhouse-Geisser, Huynh-Feldt, and lower bound) are used to compensate for the lack of sphericity. These correction domains, called epsilon, adjust the univariate test degrees of freedom, hence the F-test and related p-value. If epsilon is lower than 0.75 the degrees of freedom are adjusted by the most conservative epsilon (lower bound is the most conservative, followed by Greenhouse-Geisser) (Girden, 1992; Lomax and Hahs-Vaughn, 2012). Alternative approach is to test the multivariate mean differences between the repeated measures with Multivariate Analysis ofVariance (MANOVA). In this approach, all of repeated measures are specified as dependent variables. Moreover, MANOVA approach does not require meeting the assumption of sphericity. To test the multivariate mean differences, Wilks' lambda is recommended from the reported multivariate test statistics (Lomax and Hahs-Vaughn, 2012).

The assumption of sphericity was violated because p-values for all competencies obtained by Mauchly'ssphericity test were less than the alpha level of 0.05. For all competencies, the repeated measures ANOVAs with both lower bound and Greenhouse-Geisser correction found statistically significant p-values

(ranging from $< .001$ to $< .02$) at $\alpha = 0.05$ significance level, meaning that the mean level of average ratings per competency differs across the different sources of ratings. In addition, Multivariate test statistics, Wilks' lambda, for each competency indicated p-values less than the alpha level of 0.05, meaning that there was a statistically significant multivariate mean level difference of the average ratings. Using multiple paired t-tests, we further explored where these differences were. To control familywise error rate (FWER) in the multiple comparison, we used the Bonferroni correction with which n individual comparison was tested at a statistical significance level of 1/n times (SAS Institute Inc., 2011). Table 7 shows the mean differences and paired t-test results for the comparison between assessees (i.e., self-ratings) and assessors for each competency. The mean difference between self-ratings and manager(s) was mostly not statistically significant, indicating that the managers tend to either scored assessees lower than assessees scored themselves or scored assessees very close to assessees' self-ratings. The mean difference between self-ratings and peers, direct reports, and stakeholders was statistically significant and their ratings were generally higher than the self-ratings. Interestingly, for the competencies under 'leading yourself' domain, the results indicated that managers were more generous when rating the assessees. Our findings in self-manager discrepancy was aligned with a consistent finding in the literature, which was that self-rating were more lenient than ratings from others (Carless et al., 1998). On the contrary, peers, direct reports, and stakeholders mostly scored assessees higher than assessees scored themselves; in other words, the ratings of these sources were found higher than self-ratings.

DISCUSSION & LIMITATIONS

This study was limited to participants surveyed in seven healthcare organizations; therefore, the results found cannot be regarded as generalizable results for entire healthcare system. However, our findings with respect to the competencies which both had lowest global average scores and received statistically significant lower ratings when compared to top performer competencies in the same domain can at least alert healthcare organizations to the need for leadership growth, and assist them with the creation of their road map for leadership development program. We accomplished two major objectives in this study. First, we investigated different leadership gaps by identifying strong and weak competencies in healthcare organizations. During this investigation, we also had an opportunity to test a MSF instrument in which most

Table 3a: Descriptive statistics and one-way ANOVA with blocking results for the domain 'Leading with strategy (LS)'

		Descriptive Statistics			ANOVA Results			
Self-ratings		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Business and Financial Perspective(1)	9	5.20	0.50	2.44**	7.06*	5.80*	0.73
	Clear Vision, Engagement, and Goal Alignment(2)	9	5.05	0.30				
	Leading Change and Innovation(3)	9	5.09	0.35				
	Strategic Decision Making(4)	9	5.30	0.21				
Manager(s)		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Business and Financial Perspective(1)	9	5.14	0.45	10.01*	60.56*	46.77*	0.96
	Clear Vision, Engagement, and Goal Alignment(2)	9	4.92	0.47				
	Leading Change and Innovation(3)	9	4.88	0.47				
	Strategic Decision Making(4)	9	5.04	0.45				
Peers		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Business and Financial Perspective(1)	9	5.56	0.41	7.91*	20.68*	17.19*	0.89
	Clear Vision, Engagement, and Goal Alignment(2)	9	5.38	0.33				
	Leading Change and Innovation(3)	9	5.30	0.39				
	Strategic Decision Making(4)	9	5.59	0.33				
Direct Reports		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Business and Financial Perspective(1)	9	5.84	0.31	21.76*	42.76*	36.96*	0.94
	Clear Vision, Engagement, and Goal Alignment(2)	9	5.58	0.34				
	Leading Change and Innovation(3)	9	5.45	0.38				
	Strategic Decision Making(4)	9	5.62	0.38				
Stakeholders		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Business and Financial Perspective(1)	9	5.68	0.56	9.47*	37.85*	30.11*	0.93
	Clear Vision, Engagement, and Goal Alignment(2)	9	5.49	0.42				
	Leading Change and Innovation(3)	9	5.38	0.45				
	Strategic Decision Making(4)	9	5.67	0.35				

*$p < 0.05$ **$p < 0.1$ Note: Mean orderings are self-ratings $(4 > 1 > 2 > 3)$, managers $(1 > 4 > 2 > 3)$, peers $(4 > 1 > 2 > 3)$, direct report $(1 > 4 > 2 > 3)$, stakeholders $(1 > 4 > 2 > 3)$.

Table 3b: Confidence intervals for differences in mean level of global average scores between competencies for the domain 'Leading with Strategy (LS)'

	Self-ratings		Manager(s)		Peers		Direct Reports		Stakeholders	
	Diff.[a]	C.I.[b] (90%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)
1-2	0.15	(−0.10) - (0.41)	0.22	(0.08) - (0.38)*	0.18	(−0.02) - (0.38)	0.26	(0.13) - (0.41)*	0.19	(0.01) - (0.37)*
1-3	0.11	(−0.15) - (0.36)	0.26	(0.12) - (0.42)*	0.26	(0.07) - (0.46)*	0.39	(0.25) - (0.53)*	0.30	(0.12) - (0.49)*
1-4	-0.10	(−0.36) - (0.15)	0.10	(−0.05) - (0.25)	-0.03	(−0.22) - (0.17)	0.22	(0.09) - (0.36)*	0.01	(−0.17) - (0.20)
2-3	-0.04	(−0.30) - (0.21)	0.04	(−0.11) - (0.19)	0.08	(−0.10) - (0.28)	0.13	(−0.02) - (0.26)	0.11	(−0.07) - (0.29)
2-4	-0.25	(−0.51) - (−0.01)**	-0.12	(−0.27) - (0.03)	-0.21	(−0.40) - (−0.01)*	-0.04	(−0.18) - (0.09)	-0.18	(−0.36) - (−0.01)
3-4	-0.21	(−0.47) - (−0.04)	-0.16	(−0.31) - (−0.01)*	0.29	(−0.49) - (−0.10)*	-0.17	(−0.30) - (−0.03)*	-0.29	(−0.47) - (−0.10)*

*$p < 0.05$ **$p < 0.1$ [a],[b] Diff. and C.I. stand for difference and confidence interval, respectively. Note: Since the competencies for self-ratings are statistically different at the level of 0.1 significance, we obtained the confidence intervals at 90% limits for self-ratings.

Table 4a: Descriptive statistics and one-way ANOVA with blocking results for the domain 'Leading people (LP)'

	Descriptive Statistics			ANOVA Results			
Self-ratings	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Building Relationships and Trust(1)	9	5.47	0.21	16.26*	7.42*	10.37*	0.80
Coaching and Performance Development(2)	9	4.79	0.28				
Communication and Influence(3)	9	5.02	0.21				
Teamwork and Collaboration(4)	9	5.07	0.40				
Managing Conflict(5)	9	4.89	0.23				
Manager(s)	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Building Relationships and Trust(1)	9	5.31	0.33	9.40	23.69	18.92*	0.88
Coaching and Performance Development(2)	9	4.87	0.35				
Communication and Influence(3)	9	5.16	0.35				
Teamwork and Collaboration(4)	9	5.07	0.42				
Managing Conflict(5)	9	4.95	0.42				
Peers	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Building Relationships and Trust(1)	9	5.65	0.28	5.39	14.61	11.54*	0.81
Coaching and Performance Development(2)	9	5.36	0.25				
Communication and Influence(3)	9	5.53	0.27				
Teamwork and Collaboration(4)	9	5.49	0.27				
Managing Conflict(5)	9	5.39	0.28				
Direct Reports	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Building Relationships and Trust(1)	9	5.58	0.36	3.86	29.34	20.85*	0.89
Coaching and Performance Development(2)	9	5.36	0.30				
Communication and Influence(3)	9	5.56	0.29				
Teamwork and Collaboration(4)	9	5.52	0.32				
Managing Conflict(5)	9	5.50	0.33				
Stakeholders	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Building Relationships and Trust(1)	9	5.69	0.29	8.16	23.36	18.29*	0.87
Coaching and Performance Development(2)	9	5.43	0.40				
Communication and Influence(3)	9	5.64	0.33				
Teamwork and Collaboration(4)	9	5.53	0.36				
Managing Conflict(5)	9	5.33	0.30				

*$p<0.05$ **$p<0.1$ Note: Mean orderings are self-ratings $(1>4>3>5>2)$, managers $(1>3>4>5>2)$, peers $(1>3>4>5>2)$, direct report $(1>3>4>5>2)$, stakeholders $(1>3>4>5>2)$.

Table 4b: Confidence intervals for differences in mean level of global average scores between competencies for the domain 'Leading people (LP)'

	Self-ratings		Manager(s)		Peers		Direct Reports		Stakeholders	
	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)
1-2	0.68	(0.41) - (0.94)*	0.44	(0.21) - (0.67)*	0.29	(0.08) - (0.49)*	0.22	(0.04) - (0.40)*	0.26	(-0.05) - (0.47)*
1-3	0.45	(0.19) - (0.71)*	0.15	(-0.08) - (0.38)	0.12	(-0.08) - (0.32)	0.02	(-0.15) - (0.21)	0.05	(-0.16) - (0.26)
1-4	0.40	(0.14) - (0.67)*	0.24	(0.01) - (0.47)*	0.16	(-0.04) - (0.36)	0.06	(-0.12) - (0.24)	0.16	(-0.05) - (0.37)
1-5	0.58	(0.32) - (0.84)*	0.36	(-0.13) - (0.59)*	0.26	(0.06) - (0.46)*	0.08	(-0.09) - (0.26)	0.36	(0.15) - (0.57)*
2-3	-0.23	(-0.49) - (0.04)	-0.29	(-0.52) - (-0.06)*	-0.17	(-0.37) - (0.04)	-0.20	(-0.37) - (-0.02)*	-0.21	(-0.42) - (0.00)
2-4	-0.28	(-0.53) - (-0.01)*	-0.20	(-0.43) - (0.03)	-0.13	(-0.33) - (0.08)	-0.16	(-0.34) - (0.01)	-0.10	(-0.31) - (0.11)
2-5	-0.10	(-0.36) - (0.17)	-0.08	(-0.31) - (0.15)	-0.03	(-0.23) - (0.18)	-0.14	(-0.31) - (0.04)	0.10	(-0.11) - (0.31)
3-4	-0.05	(-0.31) - (0.22)	0.09	(-0.14) - (0.32)	0.04	(-0.16) - (0.24)	0.04	(-0.15) - (0.21)	0.11	(-0.10) - (0.32)
3-5	0.13	(-0.13) - (0.39)	0.21	(-0.02) - (0.44)	0.14	(-0.06) - (0.34)	0.06	(-0.12) - (0.24)	0.31	(0.10) - (0.52)*
4-5	0.18	(-0.09) - (0.44)	0.12	(-0.12) - (0.34)	0.10	(-0.10) - (0.30)	0.02	(-0.15) - (0.21)	0.20	(-0.01) - (0.41)

*p < 0.05 **p < 0.1 Note: Diff. and C.I. stand for difference and confidence interval, respectively.

Table 5a: Descriptive statistics and one-way ANOVA with blocking results for the domain 'Leading for results (LR)'

	Descriptive Statistics			ANOVA Results			
Self-ratings	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Planning, and Time and Resource Management(1)	9	4.83	0.32	12.70*	7.10*	8.63*	0.80
Quality Focused(2)	9	5.27	0.28				
Customer Focused(3)	9	5.35	0.27				
Driving Results(4)	9	5.02	0.32				
Manager(s)	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Planning, and Time and Resource Management(1)	9	4.89	0.43	10.74*	7.37*	8.29*	0.79
Quality Focused(2)	9	5.21	0.38				
Customer Focused(3)	9	5.52	0.12				
Driving Results(4)	9	5.13	0.43				
Peers	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Planning, and Time and Resource Management(1)	9	5.42	0.24	11.37*	13.53*	12.94*	0.86
Quality Focused(2)	9	5.67	0.24				
Customer Focused(3)	9	5.72	0.16				
Driving Results(4)	9	5.54	0.27				
Direct Reports	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Planning, and Time and Resource Management(1)	9	5.51	0.25	18.92*	23.09*	21.95*	0.91
Quality Focused(2)	9	5.80	0.30				
Customer Focused(3)	9	5.85	0.22				
Driving Results(4)	9	5.67	0.22				
Stakeholders	N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
Planning, and Time and Resource Management(1)	9	5.53	0.37	8.68*	11.42*	10.67*	0.83
Quality Focused(2)	9	5.79	0.26				
Customer Focused(3)	9	5.88	0.23				
Driving Results(4)	9	5.64	0.28				

*$p < 0.05$ **$p < 0.1$ Mean orderings are self-ratings $(3 > 2 > 4 > 1)$, managers $(3 > 2 > 4 > 1)$, peers $(3 > 2 > 4 > 1)$, direct report $(3 > 2 > 4 > 1)$, stakeholders $(3 > 2 > 4 > 1)$.

Table 5b: Confidence intervals for differences in mean level of global average scores between competencies for the domain 'Leading for Results (LR)'

	Self-ratings		Manager(s)		Peers		Direct Reports		Stakeholders	
	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)
1-2	-0.44	(-0.69) - (-0.18)*	-0.32	(-0.64) - (-0.01)*	-0.25	(-0.41) - (-0.09)*	-0.29	(-0.43) - (-0.16)*	-0.26	(-0.48) - (-0.06)*
1-3	-0.52	(-0.78) - (-0.26)*	-0.63	(-0.95) - (-0.32)*	-0.30	(-0.46) - (-0.15)*	-0.34	(-0.47) - (-0.20)*	-0.35	(-0.56) - (-0.14)*
1-4	-0.19	(-0.45) - (0.07)	-0.24	(-0.55) - (0.07)	-0.12	(-0.28) - (0.04)	-0.16	(-0.30) - (-0.03)*	-0.11	(-0.32) - (0.10)
2-3	-0.08	(-0.34) - (0.18)	-0.31	(-0.62) - (0.00)	-0.05	(-0.21) - (0.10)	-0.05	(-0.18) - (0.09)	-0.09	(-0.30) - (0.12)
2-4	0.25	(-0.01) - (0.50)	0.08	(-0.23) - (0.40)	0.13	(-0.03) - (0.29)	0.13	(-0.01) - (0.26)	0.15	(-0.05) - (0.37)
3-4	0.33	(0.07) - (0.58)*	0.39	(0.08) - (0.71)*	0.18	(0.03) - (0.34)*	0.18	(0.04) - (0.31)*	0.24	(0.04) - (0.45)*

*$p < 0.05$ **$p < 0.1$ Note: Diff. and C.I. stand for difference and confidence interval, respectively.

Table 6a: Descriptive statistics and one-way ANOVA with blocking results for the domain 'Leading yourself (LSe)'

		Descriptive Statistics			ANOVA Results			
Self-ratings		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Integrity(1)	6	5.72	0.10	40.26*	7.94*	17.17*	0.92
	Adaptability(2)	6	5.35	0.22				
	Energy and Optimism(3)	6	5.16	0.21				
Manager(s)		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Integrity(1)	6	5.66	0.34	8.95*	11.97*	11.11*	0.89
	Adaptability(2)	6	5.37	0.25				
	Energy and Optimism(3)	6	5.35	0.26				
Peers		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Integrity(1)	6	5.87	0.32	28.67*	76.04*	62.51*	0.98
	Adaptability(2)	6	5.64	0.29				
	Energy and Optimism(3)	6	5.64	0.27				
Direct Reports		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Integrity(1)	6	5.80	0.32	3.74**	24.45*	18.53*	0.93
	Adaptability(2)	6	5.68	0.28				
	Energy and Optimism(3)	6	5.63	0.29				
Stakeholders		N_{block}	Mean	S.D.	Competency(F)	Block(F)	Overall Model(F)	R-Square
	Integrity(1)	6	5.96	0.25	18.01*	42.35*	35.38*	0.96
	Adaptability(2)	6	5.74	0.25				
	Energy and Optimism(3)	6	5.78	0.21				

*$p<0.05$ **$p<0.1$ Note: Mean orderings are self-ratings $(1>2>3)$, managers $(1>2>3)$, peers $(1>2=3)$, direct report $(1>2>3)$, stakeholders $(1>3>2)$.

Table 6b: Confidence intervals for differences in mean level of global average scores between competencies for the domain 'Leading yourself (LSe)'

	Self-ratings		Manager(s)		Peers		Direct Reports		Stakeholders	
	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)	Diff.	C.I. (95%)
1-2	0.37	(0.19) - (0.54)*	0.29	(0.07) - (0.53)*	0.23	(0.14) - (0.33)*	0.12	(-0.06) - (0.29)	0.22	(0.11) - (0.33)*
1-3	0.56	(0.39) - (0.74)*	0.31	(0.09) - (0.54)*	0.23	(0.14) - (0.34)*	0.17	(-0.00) - (0.35)	0.18	(0.08) - (0.29)*
2-3	0.19	(0.02) - (0.38)*	0.02	(-0.21) - (0.25)	0.00	(-0.09) - (0.10)	0.05	(-0.12) - (0.23)	-0.04	(-0.14) - (0.07)

*$p<0.05$ **$p<0.1$ Note: Diff. and C.I. stand for difference and confidence interval, respectively.

Table 7: Comparison of assesees' self-ratings versus assessors' ratings

Leadership competencies	2 vs. 1	3 vs. 1	4 vs. 1	5 vs. 1
Business and Financial Perspective (LS1)	0.00	0.41*	0.69*	0.49*
Clear Vision, Engagement, and Goal Alignment (LS2)	-0.12	0.33*	0.51*	0.45*
Leading Change and Innovation (LS3)	-0.21*	0.22*	0.38*	0.29*
Strategic Decision Making (LS4)	-0.26**	0.29*	0.31*	0.36*
Building Relationships and Trust (LP1)	-0.16	0.18**	0.11	0.22**
Coaching and Performance Development (LP2)	0.11	0.57*	0.58*	0.62*
Communication and Influence (LP3)	0.09	0.47*	0.50*	0.58*
Teamwork and Collaboration (LP4)	0.09	0.48*	0.53*	0.55*
Managing Conflict (LP5)	-0.01	0.46*	0.57*	0.39**
Planning, and Time and Resource Management (LR1)	0.06	0.59*	0.68*	0.70*
Quality Focused (LR2)	-0.08	0.39*	0.52*	0.51*
Customer Focused (LR3)	0.15	0.35*	0.47*	0.51*
Driving Results (LR4)	0.12	0.52*	0.65*	0.62*
Integrity(Lse1)	0.22*	0.16	0.08	0.22*
Adaptability(Lse2)	0.38*	0.27	0.31**	0.38*
Energy and Optimism(Lse3)	0.61*	0.50*	0.50*	0.61*

*p < (0.05/4) **p < (0.1/4) self-ratings (1), manager (2), peers (3), direct reports (4), stakeholders (5)
Note: p-values in highlighted cells were very close to critical p-value.

of the competencies were specifically proposed for healthcare administrators at a variety of organizations and career levels by Garman et al. (2004). The MSF instrument is one of the commonly used performance management techniques in organizations along with other techniques: balance scorecard, upward appraisal, team appraisal, forced ranking/Bellcurve, and manager and employee training (Nankervis and Compton, 2006; Chang et al., 2008; Punniyamoorthy and Murali, 2009; Aravamudhan, 2011; Kunz, 2011; Öztayşi and Sari, 2012). Using both descriptive statistics (e.g., global average scores) and the method of multiple comparisons for each different source of ratings in each domain after running one-way ANOVA w/blocking design, those leadership competencies that would need development were determined. During multiple comparisons, we mostly investigated whether the gap between the competency that had lowest global average score and the competency that had highest global average score were statistically significant. Second, while making an assessment of the leaders' strengths and development areas, the level of agreement in the ratings across different sources should also be considered (Carless et al., 1998). Using the repeated measures ANOVA design, we compared the averaged self-ratings per question to the averaged aggregated ratings of assessors per question both of which were

asked for the same competency across seven organizations. We found that managers' ratings were either lower than or close to self-ratings except managers' ratings in 'leading yourself' domain in which managers rated assessees higher than self-ratings. This was similar to results found in the study of Atkins et al. (2002) in which it was shown that supervisor ratings were significantly lower than self-ratings.

There were a few drawbacks in our study. First, it was necessary to perform the reliability check for questions and the validity check for the competencies and domains. We were unable to use the ratings of each individual to perform these tests due to the confidentiality concerns from the organizations. Instead, we were only allowed by the organizations to use both the averaged self-ratings per question and the averaged aggregated ratings of assessors per question. Using the individual ratings, reliability check would have been performed by assessing the Cronbach's alpha coefficient, which is the indicator for internal consistency, for each competency. To test the validity of our 360-degree assessment tool (Wood et al., 2006, Lockyer, 2003), if the individual ratings are obtained, a future study should run a second order confirmatory analysis model to understand how strongly a specific competency influences the questions, including newly added and reworded questions, and how strongly a

domain influences the specific competency. With this way, the domains can be constructed more reliably instead of arranging them into the clusters intuitively. In addition, a further analysis can also be done by using multi-trait multi method (MTMM) to examine the convergent and discriminant validity in order to understand the level of agreement across different sources of ratings. Second, we could not present any demographic information such as gender, age, and etc. about the participants due to confidentiality concerns raised by the organizations. Last, since we performed significance test for overall model multiple times in both objectives, the chance of making at least one type 1 error (a false rejection of the null hypothesis or FWER) is much higher than the assigned individual significance levels ($\alpha = 0.05$ or 0.10) (SAS Institute Inc., 2011). Therefore, we need to readjust the individual significance levels to lower level to control the FWER (SAS Institute Inc., 2011). For example, when we used the Bonferroni correction to readjust the individual significance levels (e.g., $0.05/16 = 0.003$ for first objective) we still obtained statistically significant p-values for overall models (e.g., mostly p-values are less than .001).

CONCLUDING REMARKS

Some competencies that significantly received lower ratings can be closely aligned with the definition of four components of transformational leadership model. The competencies, 'Clear Vision, Engagement, and Goal Alignment (LS2)', 'Coaching and Performance Development (LP2)' and 'Managing Conflict (LP5)', 'Leading Change and Innovation (LS3)', and 'Energy and Optimism (Lse3)' both had low mean values and received statistically significant low ratings when compared to the top performer competencies in the same domain, and they can be closely identified with the definition of IM, IC, IS, and II, respectively. From this viewpoint, these results also suggest that healthcare organizations should pay more attention to the developmental needs of transformational leadership behaviors.

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