Targeted needs assessment for a leadership curriculum in a medical college of a developing country

Kulsoom Ghias[2], Rehana Rehman[2], Saniya Sabzwari[2], Faiza Alam[2], Alizeh Abbas[2], Preet Ayoub Shaikh[2], Usman Tariq Siddiqui[3]

Corresponding author: Dr Kulsoom Ghias kulsoom.ghias@aku.edu
Institution: 2. Aga Khan University, 3. Aga Khan University (previous affiliation)
Categories: Learning Outcomes/Competency, Medical Education (General), Students/Trainees

Received: 17/04/2017
Published: 20/04/2017

Abstract

Background: Leadership is an important competency expected of medical graduates. However, formal leadership curricula have been adopted sparingly and there is no reported curriculum specifically developed for resource-constrained healthcare settings that face unique challenges.

We conducted a targeted needs assessment to assess perspectives of students, faculty members and academic leaders regarding the leadership-related competencies required for an undergraduate medical curriculum at a private medical college in Karachi, Pakistan.

Methods: A mixed method design was adopted. For the quantitative arm, a questionnaire was completed by 227 undergraduate medical students to assess leadership potential and perceptions regarding a leadership curriculum. For the qualitative arm, focus group discussions and semi-structured interviews were conducted with nineteen faculty members and two academic leaders for their perspective on required competencies and ideal teaching, learning and assessment methodology.

Results: Faculty, academic leaders and students agreed on the definitions of leadership, perceived existing leadership qualities in students, and need for a formal integrated, longitudinal leadership curriculum. However, there were differences of opinion among stakeholders regarding preferred modes of learning that need to be reconciled for an effective curriculum.

Conclusions: The study reported can inform the design of an innovative leadership curriculum in resource-constrained context.
Keywords: needs assessment; resource-constrained settings; undergraduate medical education; leadership curriculum

Introduction

Medical graduates are expected to attain core competencies that are essential for effective healthcare practitioners. These include being a leader and manager, which requires self-awareness, teamwork, communication skills, empathy, and humility (Stoller, 2008; Varkey P, Peloquin J, Reed D, Lindor K, & Harris, 2009) and aligns with the role of physicians as medical experts entrusted with healthcare reform and improving patient care (Novack DH, Epstein RM, & Paulsen, 1999). Leadership has often been seen as an inherent quality defined by an individual’s charisma and dynamism, discounting the possibility of developing leadership skills (Dass TK & Parks, 2006; Varkey P et al., 2009). While medical curricula have traditionally centered on knowledge of disease and principles of treatment, they are now evolving to ensure attainment of required competencies, including leadership (Stoller, 2009).

Several recommendations have been made regarding leadership training for medical students (Kohn, 2004), but formal leadership curricula have been adopted sparingly despite support from students, graduates, and physicians towards such a change (Abbas MR, Quince TA, Wood DF, & Benson, 2011). Among the pioneers of integrating leadership in medical school curricula in the developed world were 18 U.S medical schools participating in the Undergraduate Medical Education for the 21st Century (UME-21) project (Rabinowitz HK et al., 2001). This project encompassed nine content areas, including Leadership and Teamwork – a previously neglected topic – to enable students to provide high-quality, accessible, and affordable care in the modern health care environment (O’Connell MT & Pascoe, 2004). In the UK, the Academy of Medical Royal Colleges and National Health Service Institute for Innovation have developed a Medical Leadership Competency Framework (MLCF), which has been recommended for integration into medical school curricula (Academy of Medical Royal Colleges & Improvement, 2010).

All existing leadership curricula described in the literature, however, focus on developed countries where better infrastructure and availability of resources are coupled with challenges of managed healthcare. These factors are very different from those in developing countries. In resource-constrained settings, physicians must deal with a unique set of circumstances that are different in each region, each country, and even each locality at times. In a country like Pakistan, lack of basic resources, poor infrastructure, absence of affordable insurance policies for the common man, language and cultural barriers significantly increase the magnitude of healthcare issues. In addition, generations-old beliefs and poor health literacy, and the widening disparity between public and private healthcare facilities pose further challenges (Kurji Z, Premani ZS, & Mithani, 2016). A unique approach therefore has to be taken to develop patient-doctor relationships, provide high-quality, affordable care and achieve positive outcomes. This requires a physician to continuously adapt, drive change and provide leadership in adverse circumstances.

At the Aga Khan University (AKU) Medical College in Karachi, Pakistan, one of the professional attributes expected of graduates after completion of a five-year Bachelor of Medicine, Bachelor of Surgery (MBBS) degree is ‘leadership to address societal issues’. However, a formal leadership curriculum does not currently exist. In order to develop a structured leadership curriculum specific to a resource-constrained setting, we conducted a targeted needs assessment to assess perspectives of students, faculty members and academic leaders regarding the leadership-related competencies necessary in an undergraduate curriculum, aspects of leadership currently being delivered through formal or hidden curriculum, additional content necessary and preferred mode of learning and assessment.
Methods

Ethical considerations

The study was approved by the Ethical Review Committee of Aga Khan University (ERC#: 3253-BBS-ERC-14). Participants were provided with information regarding the study and informed consent was taken. Confidentiality of participants was ensured.

Study design

A mixed method design was adopted to meet the needs assessment objectives. Questionnaires, Focus Group Discussions (FGD) and semi-structured interviews were employed to collect data from the target population of the study.

Participants

Students: All students were invited to participate in the study. 227 out of the ~500 students that make up the undergraduate student body at AKU (there are approximately 100 students in each of the five undergraduate years) responded.

Faculty: All faculty members from the undergraduate medical education (UGME) programme were invited to participate in the study via email. Nineteen faculty members, including basic science and clinical faculty that interact routinely with students and/or are involved in administering the curriculum, responded and were included as participants.

Curriculum decision-makers and academic administrators/leadership: Through purposive sampling, two academic leaders who are directly responsible for the UGME programme in Karachi were interviewed.

Questionnaire: UGME students (Year 1 to 5)

A questionnaire was developed to assess student leadership potential and perceptions regarding a leadership curriculum. The questionnaire used had several sections. Section I addressed existing leadership qualities and was adapted from Academy of Medical Royal Colleges & NHS Institute for Innovation and Improvement Medical Leadership Competency Framework (MLCF) (Academy of Medical Royal Colleges & Improvement, 2009, 2010). Section II contained items assessing the required competencies of a leadership curriculum (Spurgeon P & Down, 2010; Stoller JK, Taylor CA, & Farver, 2013). Section III focused on the preferred mode of learning and assessment adapted from Varkey et al. (Varkey P et al., 2009). The questionnaire was validated by a small group of content experts (5-10 members), curriculum developers and researchers who had understanding and experience of pedagogy and medical education research. Students being key stakeholders were also invited to review the tool. The group commented on the importance of each item within each subscale/domain, based on their understanding of the conceptual definition of each subscale/domain. Moreover, they provided feedback on the clarity of language and made suggestions for modifications of the tool.

Focus Group Discussions: UGME faculty

FGDs were conducted with teachers from basic science and clinical faculty for their perspective on required competencies and ideal teaching, learning and assessment methodology. Three FGDs were conducted with 19 faculty members involved in teaching in UGME. The duration of the interview was 45-60 minutes. The FGD was
audio-recoded and transcribed with consent. To avoid bias, the FGDs were conducted by individuals with the requisite experience.

*Semi-Structured interviews: Academic administrators/leadership*

Semi structured interviews were conducted with two academic leaders to understand their expectations as well as any challenges associated with a leadership curriculum in the UGME program at AKU Karachi.

**Data analysis**

The data from the participants was analyzed for each individual according to study objectives/research questions using quantitative and qualitative techniques. Data was stored and analyzed using SPSS 16.0. The questionnaire was divided into three main sections. In section I, ninety questions were divided into five major themes (Demonstrating personal qualities, Working with others, Managing Services, Improving services and Setting directions), and these themes further explored on the basis of different variables/sub-themes given in Table 1. Agreement by participants with each questionnaire item was determined by merging ‘Strongly agree’ and ‘Agree’ responses; disagreement was determined by merging ‘Strongly disagree’ and ‘Disagree’ responses. Section II focused on the knowledge, skills and attitudes important for a leadership curriculum, and section III explored the most appropriate teaching/learning strategies.

**Results**

**Student questionnaire**

The questionnaire was completed by 227 out of the total ~500 undergraduate medical students at AKU (response rate of 45%). Year 1 students made up 24% of the respondents, Year 2 students 29%, Year 3 students 14%, Year 4 students 16% and Year 5 students 17%. Fifty-five percent of the respondents were female. The pre-medical school educational background of majority of the students (87%) was the British system of GCE O and A levels. Respondents were almost equally split between those who were from Karachi (44.68%) and those from other parts of Pakistan (48.40 %); 6.91% were from outside the country.

Table 1 lists all the themes and sub-themes of medical leadership competency framework on which students were probed in the questionnaire. The items that had the greatest and least agreement in each sub-theme are provided. Detailed results and responses to all items are provided in the supplementary material.

| Themes            | Sub-themes                                                                 | Agreement | Percentage of respondents |
|-------------------|-----------------------------------------------------------------------------|-----------|--------------------------|

Table 1. Leadership competency themes and sub-themes
| Demonstrating Personal Qualities | Developing self-awareness |
|---------------------------------|--------------------------|
| I am aware of my own values and emotions, behaviors and preferred roles and how these can impact on others | Greatest 93.6 |
| I effectively participate and fulfill different roles (leader, team player) in small group activities | Least 76.2 |

| Managing Yourself |
|--------------------|
| I take professional responsibilities seriously | Greatest 89.3 |
| I manage time constructively and meet deadlines | Least 64.5 |

| Continuing personal development |
|---------------------------------|
| I am willing to learn from leadership experiences | Greatest 84.0 |
| I use a range of assessment tools to identify my own strengths and development needs | Least 55.2 |

| Acting with integrity |
|-----------------------|
| I consider personal responsibility to maintain professional standards | Greatest 90.1 |
| I can identify and debate on legal and ethical issues pertaining to medical practice | Least 69.9 |

| Working with others | Developing networks |
|---------------------|---------------------|
| I understand the importance of teamwork and collaboration in healthcare | Greatest 89.0 |
| I rehearse and participate in a multi-disciplinary team meeting in a real or simulated setting | Least 61.0 |

| Building and maintaining relationships |
|---------------------------------------|
| I support my peers | Greatest 86.2 |
| I have a reflective working relationship with a tutor/mentor | Least 69.5 |

| Encouraging contribution |
|---------------------------|
| I recognize and value views from others within the multi-professional team | Greatest 83.3 |
| I create synergy by involving the right people in all phases of work | Least 70.2 |

| Working within teams |
|----------------------|
| I understand shared leadership and give responsibilities to others | Greatest 83.0 |
| I collaborate with colleagues to seek solutions in both learning and health care settings | Least 78.4 |
Students identified oral communication, time management, conflict resolution and negotiation skills, emotional intelligence, and knowledge of ethical principles as the most important competencies of leadership. On the other hand, billing, coding and compliance, and knowledge of investment principles were considered least important (Table 2).

### Table 2. Perceptions of students regarding required leadership competencies

| Competency (Knowledge/skill/attitude)                                      | Important |
|--------------------------------------------------------------------------|-----------|
| Knowledge of leadership theory                                            | 97.2      |
| Knowledge about academic program development and improvement             | 97.9      |
| Knowledge of private or academic practice, managed care                   | 98.6      |
| Knowledge about billing, coding, and compliance | 95 |
|-----------------------------------------------|----|
| Knowledge of management principles            | 97.5 |
| Knowledge of investment principles            | 96.1 |
| Knowledge of ethical principles               | 98.9 |
| Knowledge of risk management                  | 98.6 |
| Oral communication skills                     | 98.9 |
| Written communication skills                  | 98.9 |
| Time management skills                        | 99.6 |
| Conflict resolution skills                    | 99.6 |
| Negotiations skills                           | 99.3 |
| Ability to be a team player                   | 98.9 |
| Humility and self confidence                  | 98 |
| Creative attitude                              | 97.9 |
| Emotional intelligence                        | 98.2 |
| Community advocacy                            | 99.6 |

Problem-based learning and case studies were identified by students as the most effective whereas writing assignments and didactic lectures were the least effective ways of teaching/learning strategies for leadership training (Table 3).

**Table 3. Preferred teaching/learning methods appropriate for leadership trained identified by students.**

| Learning Method                        | Percentage of students who strongly agree |
|----------------------------------------|------------------------------------------|
| Problem-based learning                 | 89.4                                     |
| Case studies                           | 84.7                                     |
| Simulation/role-play                   | 83                                       |
| Study group – faculty-led              | 76.2                                     |
| Study group – peer-led                 | 73                                       |
| Panel discussions                      | 71.5                                     |
| Study group – resident-led             | 71.3                                     |
| Self-reflection journaling             | 57.8                                     |
| Readings                               | 57.1                                     |
Online modules | 52.8
Didactic lectures | 51.2
Writing assignments | 46.6

No significant difference in the perception of existing leadership qualities, required competencies of a leadership curriculum, and preferred mode of learning was found on the basis of students’ demographics or year of study.

**Focus Group Discussions**

For the qualitative arm of the study, a total of 19 faculty members (8 men and 11 women) participated in the focus group discussions. Several themes emerged and there was largely consensus among faculty members, except on a few points, as evidenced by the representative remarks provided below.

**Defining leadership**

There was consensus among the faculty members that a physician-leader is someone who can take initiative, motivate self and others, be highly ethical and make a meaningful contribution to society. Team-work, communication skills, critical and innovative thinking, reliability, and credibility were also considered extremely important attributes of a good leader.

‘A leader should be able to motivate the people he is working with and his success should be the team’s success and vice versa.’

- Faculty member A

‘A leader contributes back to the society or community in which they have developed.’

- Faculty member B

‘Reliability and credibility, ability to change, innovative and critical thinking are all attributes of a good leader.’

- Faculty member C

**Existing leadership qualities**

Some faculty members felt that having had experiences of working as Team Captains and Student Council members are evidence of pre-existing leadership qualities. However, others thought that positions are more managerial positions and any leadership potential identified at the time of admission needs to be further developed.

**Teaching and learning leadership**

The majority of faculty felt that leadership can be learnt and developed, and therefore advocated for the integration
of a formal leadership curriculum longitudinally into the existing curriculum.

‘Leadership can be taught; it is like passing the torch from one person to another.’

- Faculty member D

‘Teaching leadership should be a continuous process. It should not be limited to one module and should be taught throughout the year for 5 years (of medical school).’

- Faculty member E

A number of faculty members felt that there were already existing opportunities to inculcate leadership in the medical students, through problem-based learning (PBL), in the 6-week Humanities and Social Sciences Module (HASS) at the beginning of medical curriculum and clinical clerkships.

‘PBL provides one area where you can inculcate a little bit more (leadership) by giving them feedback and focusing on their leadership qualities.’

- Faculty member F

‘In the wards, clinics, or ER, they learn how to take charge of the situation and have to take some decisions on their own, and that’s how they start to learn.’

- Faculty member G

Additional ways to inculcate leadership in students suggested included role-modeling, reflective practice, community-based internships or projects, additional responsibilities in clinical settings, projects, and student-run societies.

‘You have so many leaders working at all levels, show them, share with them the stories of the leaders within AKU, outside AKU in health care, [those who] are working in the community. I think it’s important to have leaders shine and let them learn their stories.’

- Faculty member H

‘One thing that can be done is to ask students to make groups of 10 to 15, let them decide how to develop their [community] project…who will be the decision maker and let them proceed…’

- Faculty member I

Assessing leadership

Majority of the faculty favored self-evaluation and 360° evaluation strategies to inculcate and assess leadership in students.
Semi Structured Interviews

Two academic leaders were interviewed using a semi-structured approach. Their views were similar to faculty members and supported the implementation of a formal leadership curriculum, highlighting the importance of developing the practice of reflection as a key strategy.

‘Reflective exercises will harness people who enter with leadership qualities and encourage those who do not have those qualities. They can learn how they can fight for the rights of people, how they can differentiate between right and wrong, and how they can initiate change.’

Discussion

This targeted needs-assessment study is the first of its kind reported from a developing country. The study was able to fulfill its objectives in gathering student and faculty perspectives on leadership in undergraduate medical education, its implementation and significance.

Leadership, both situational and organizational, can be taught (Parks, 2005) and is recognized as an important competency to be achieved by medical graduates. Majority of the faculty participants in the study reported here agreed that leadership can be nurtured, in alignment with student perception. The defining qualities of a leader highlighted by both groups were similar to those in previous studies that identified interpersonal and communication skills, professional ethics and responsibility, and continuous learning and improvement as key traits (McKenna MK, Gartland MP, & Pugno, 2003).

Our study showed no difference in student perception based on gender, city of origin, educational background and other demographics. While a recent study has ranked Pakistan as second-last in the world in gender equality (Khan, 2016), being female did not appear to negatively affect self-perception of existing leadership qualities in our cohort. Similarly, educational background or city of origin did not affect perceptions of existing leadership qualities, required competencies and preferred mode of learning. This can likely be attributed to the undergraduate medical admissions process at AKU through which highly motivated individuals of both genders are selected from urban and rural settings. The competitive selection process perhaps nullifies any differences that would have otherwise existed because of gender or educational background. From the perspective of curriculum design, a uniform baseline among students is advantageous, but it would be important to keep in mind that the literature reveals differences in the eventual leadership styles of women and men (Eagly AH & Johannesen-Schmidt, 2001).

Majority of students recognized that an understanding of billing, coding and investment principles were important aspects of leadership, identifying a common gap in the existing undergraduate medical curriculum. These results are similar to those reported by Varkey et al. in a study cohort from the developed world (Varkey P et al., 2009), although students in the current study emphasized the importance of knowledge of investment principles for leadership more than previously reported (96% vs. 55%). A previous study from Pakistan on financial wellness has also identified financial literacy, financial security and knowledge of budget plans as concepts deficient in medical students (Rehman R, Katpar S, Khan R, & Hussain, 2015). These findings could be indicative of a shift towards the relevance of finance in the practice of medicine.

Despite differences in educational backgrounds and circumstances, medical students from both developed and developing world (Quince T et al., 2014; Varkey P et al., 2009) have similar perceptions regarding importance of
ethic principles, communication, time management and conflict resolution as key skills for leadership. Another study conducted in 2005 revealed that 96% of American medical students felt that knowledge of health policy was important to their career, while 54% expressed dissatisfaction with the health policy curriculum in medical school (Agrawal JR et al., 2005). The current study revealed that our students acknowledge the importance of understanding health policy, but many are not aware of healthcare system data resources. Students from both the developed and the developing world identify this as a common area of deficient training.

Similarities were also observed in preferred learning methods for a leadership curriculum between the cohort in this study and those previously published from developed countries (Quince T et al., 2014; Varkey P et al., 2009). Students in the current study preferred problem-based learning, case studies and simulation/role-play the most. Students surveyed in the Varkey et al. study also preferably identified simulation and case studies, and additionally study groups as useful (Varkey P et al., 2009). Both cohorts rated readings, didactic lectures, reflective journaling and writing assignments as less preferential modes of learning leadership. An ideal theoretical framework for a leadership curriculum can be found in Kolb's theory of experiential learning (Kolb, 2014), which provides a holistic model of processes that influence learning. Student preference of active modes of learning aligns well with designing a leadership curriculum that allows students to progress through Kolb’s learning cycle of concrete experience, abstract conceptualization, reflective observation and active experimentation (Kolb AY & Kolb, 2012).

Reflective practice, an important component of Kolb’s learning cycle, has been shown to increase the moral conscience of leaders considerably, resulting in more effective leaders (Branson, 2007; Goleman D, Boyatzis RE, & McKee, 2002). While reflective practice was identified as a key teaching/learning tool for leadership by most faculty members in the current study, students did not perceive this as a key learning strategy for leadership. This discrepancy identifies a key deficiency that needs to be formally addressed in curriculum development. Given the importance of reflective practice for leadership documented in the literature, implementation of such a pedagogical approach will require justification and buy-in from students for effective execution.

Medical curricula has to keep pace with the evolving nature and demands of healthcare systems that require physician-leaders (Tibbitts, 1996). Our study and other similar studies from developed countries suggest that to keep up with the evolving responsibilities of a medical practitioner, leadership needs to be formally integrated into medical curricula. While models such as the UK’s Medical Leadership Competency Framework provide a good starting point (Academy of Medical Royal Colleges & Improvement, 2010), they cannot be transplanted and adopted in totality since the needs of the developing world are different. For example, emphasis on managed care and insurance regulations may be important in other countries, but it is not a major issue in Pakistan, where most patients pay out-of-pocket. Instead, ethics of contradictions between medical and social realities and class disparities are of significant importance for health professionals in resource-constrained settings, such as Pakistan. Another aspect to consider when implementing a leadership curriculum is true integration with existing curricula rather an add-on feature, which is less likely to be successful because of curricular pressures and disinterest amongst students (Martins HMG, Detmer DE, & Rubery, 2005).

Some limitations of the study should be kept in mind. Primarily, the data is limited to one private medical college in Pakistan and generalizations when extrapolating findings to other, public universities in different cities and regions must be made with caution and contextually. Another limitation was that a bias was likely introduced in the study due to self-selection of participants. We were not able to include the perspectives of those stakeholders who are less inclined towards innovation in medical education and curriculum design. This may also have impacted the statistical analysis of the quantitative arm of the study.

While this study provides answers to a targeted needs-assessment and can inform development of a leadership
curriculum, it does not guarantee success and impact of its implementation, which will be dependent on several factors such as student engagement, faculty willingness, and availability of time, among others.

Conclusion

There exists a need to incorporate a leadership curriculum in undergraduate medical education. Whereas challenges for implementation and variation of impact are both valid possibilities, this study can inform design of leadership curricula in resource-constrained settings and serves as a stepping stone to developing an innovative curriculum of leadership for the medical students of today.

Supplementary material

SUPPLEMENTARY TABLES

Students were asked to indicate whether they strongly agree, agree, are neutral, disagree or strongly disagree with each of the statements pertaining to a medical leadership competency framework below. Percentage of participant responses are provided.

Key: A: Strongly agree and agree merged; N: neutral; D: strongly disagree and disagree merged

Theme 1: Demonstrating Personal Qualities

|                                              | A  | N  | D  |
|----------------------------------------------|----|----|----|
| Developing self-awareness                    |    |    |    |
| 1 I realize the role of self-assessment and multi-source feedback in developing management and leadership qualities | 88.7 | 9.2 | 2.1 |
| 2 I am aware of my own values and emotions, behaviors and preferred roles and how these can impact on others | 93.6 | 5.0 | 1.4 |
| 3 I effectively participate and fulfill different roles (leader, team player) in small group activities | 76.2 | 18.9 | 5.0 |
| 4 I can reflect on my own behaviour and how it may impact others | 87.9 | 10.3 | 1.8 |
| 5 I can identify and reflect on personal strengths and weaknesses to develop personal goals for leadership role | 80.9 | 17.4 | 1.8 |
| 6 I respect the rights and interests of patients and the public | 91.1 | 7.4 | 1.4 |
| 7 I am willing to seek out and learn from constructive feedback from others | 84.8 | 13.1 | 2.1 |
| Managing Yourself                           |    |    |    |
| 8 I know the impact of personal physical and mental health on my personal effectiveness | 88.6 | 9.3 | 2.1 |
| 9 I have a thorough understanding of my own emotions and feelings and how they impact the situation at hand | 80.1 | 14.9 | 5.0 |
|   | Description                                                                 | Score | Progress | Total |
|---|------------------------------------------------------------------------------|-------|----------|-------|
| 10 | I maintain my own health and safety                                           | 80.1  |          |       |
| 11 | I recognize and address personal stress                                      | 69.9  |          |       |
| 12 | I display stamina, energy and intensity to achieve high standards of performance | 73.0  |          |       |
| 13 | I balance multiple tasks and prioritize when faced with limited time and resources | 70.2  |          |       |
| 14 | I manage time constructively and meet deadlines                              | 64.5  |          |       |
| 15 | I tend to keep a mental record of every commitment that is made              | 72.6  |          |       |
| 16 | I can find a way to get things done and will sacrifice personally to reach the goal | 73.0  |          |       |
| 17 | I view my own successes with pride and humility                              | 71.9  |          |       |
| 18 | I take professional responsibilities seriously                                | 89.3  |          |       |
| 19 | I operate by value, that is my work philosophy is grounded on clear principles | 82.6  |          |       |
| 20 | I am aware of my own limitations                                              | 82.6  |          |       |
|    | **Continuing personal development**                                          |       |          |       |
| 21 | I know advantages and disadvantages of different approaches to learning      | 74.4  |          |       |
| 22 | I know advantages and disadvantages of different leadership types and style  | 68.1  |          |       |
| 23 | I use a range of assessment tools to identify my own strengths and development needs | 55.2  |          |       |
| 24 | I set achievable development goals based on these needs                      | 67.7  |          |       |
| 25 | I select and make effective use of learning activities to meet these goals   | 67.0  |          |       |
| 26 | I am self-directed in learning and reflective practice                       | 75.0  |          |       |
| 27 | I am willing to learn from leadership experiences                            | 84.0  |          |       |
|    | **Acting with integrity**                                                    |       |          |       |
| 28 | I foster effective and respectful relationships with others, valuing diversity | 85.0  |          |       |
| 29 | I can identify and debate on legal and ethical issues pertaining to medical practice | 69.9  |          |       |
| 30 | I recognize when ethics/values are challenged in practice and seek advice in such situations | 82.3  |          |       |
| 31 | I respect professional and institutional regulations                         | 82.3  |          |       |
| 32 | I consider personal responsibility to maintain professional standards        | 90.1  |          |       |
| 33 | I take interest and engage with cultural issues that may affect relationships with others | 81.2  |          |       |
### Theme 2: Working with others

| Activity                                                                 | A   | N   | D   |
|-------------------------------------------------------------------------|-----|-----|-----|
| **Developing networks**                                                 |     |     |     |
| 34 I know the roles and responsibilities of members of a multi-disciplinary team | 78.7 | 19.1 | 2.1 |
| 35 I care for a patient as part of a multi-professional team            | 81.9 | 15.7 | 2.5 |
| 36 I involve others appropriately in problem solving and decision making | 79.4 | 15.3 | 5.3 |
| 37 I rehearse and participate in a multi-disciplinary team meeting in a real or simulated setting | 61.0 | 29.8 | 9.2 |
| 38 I engage with others to develop a supportive and effective network   | 73.8 | 22.7 | 3.5 |
| 39 I consult outside resources (e.g. magazines and databases) and make connections between and among information, events that reveal key issues, problems or opportunities | 66.9 | 23.5 | 9.6 |
| 40 I understand the importance of teamwork and collaboration in healthcare | 89.0 | 8.9  | 2.1 |
| **Building and maintaining relationships**                              |     |     |     |
| 41 I know how to keep a positive environment                            | 84.0 | 12.4 | 3.5 |
| 42 I am aware of factors that contribute to effective team working      | 83.7 | 12.8 | 3.5 |
| 43 I know about principles of effective feedback, handover and delegation | 72.0 | 22.3 | 5.7 |
| 44 I have a reflective working relationship with a tutor/mentor         | 69.5 | 18.8 | 11.7|
| 45 I gain respect from colleagues, health care practitioners and patients | 79.1 | 18.4 | 2.5 |
| 46 I support my peers                                                   | 86.2 | 12.1 | 1.8 |
| 47 I recognize communication challenges in different health care settings | 81.1 | 16.4 | 2.5 |
| 48 I learn from others and share my own learning with others            | 85.8 | 13.1 | 1.1 |
| 49 I understand the importance of effective communication with colleagues and patients | 86.1 | 13.5 | 0.4 |
| **Encouraging contribution**                                            |     |     |     |
| 50 I recognize and value views from others within the multi-professional team | 83.3 | 13.8 | 2.8 |
| 51 I challenge constructively and respond positively to challenge from others | 74.4 | 21.7 | 3.9 |
| 52 I work effectively with a diverse range of individuals from differing social classes, educational attainment, disabilities, cultures and sexual orientation | 82.6 | 13.5 | 3.9 |
| 53 I create synergy by involving the right people in all phases of work | 70.2 | 24.8 | 5.0 |
| **Working within teams**                                               |     |     |     |
| 54 I understand shared leadership and give responsibilities to others   | 83.0 | 14.5 | 2.5 |
| 55 I understand team dynamics including problems that can occur in teams and ways of addressing these | 81.5 | 15.3 | 3.2 |
Theme 3: Managing Services

| Planning | A   | N   | D   |
|----------|-----|-----|-----|
| 60       | 69.1| 23.4| 7.4 |
| 61       | 71.9| 22.4| 5.7 |
| 62       | 70.6| 22.3| 7.1 |
| 63       | 70.5| 21.4| 8.2 |
| 64       | 84.0| 11.3| 4.6 |
| 65       | 81.6| 14.5| 3.9 |
| Managing resources | A   | N   | D   |
| 66       | 74.8| 18.8| 6.4 |

| Managing people | A   | N   | D   |
|-----------------|-----|-----|-----|
| 67               | 72.3| 19.5| 8.2 |
| 68               | 87.9| 8.5 | 3.6 |
| 69               | 85.8| 11.7| 2.5 |
| 70               | 80.9| 14.9| 4.3 |
| 71               | 72.7| 24.1| 3.2 |

| Encouraging improvement and innovation | A   | N   | D   |
|---------------------------------------|-----|-----|-----|
| 72                                   | 67.4| 26.2| 6.4 |

Theme 4: Improving Services

| FACILITATING TRANSFORMATION | A   | N   | D   |
|----------------------------|-----|-----|-----|
| 73 I know strategies for motivating people to change | 65.5| 25.3| 9.3 |
| 74 I know how organizational culture can impede or facilitate improvement in health services | 70.1| 23.5| 6.4 |
75. I recognize barriers to change and suggest ways of addressing these 70.9 23.0 6.0
76. I exhibit a positive attitude to implementing change 76.2 17.4 6.4
77. I am committed to engage others in change 76.7 15.1 8.2
78. I take care of others sensitivity about change 75.7 16.1 8.2

Theme 5: Setting Directions

| Identifying the contexts for change | A   | N   | D   |
|-------------------------------------|-----|-----|-----|
| 79. I can identify sources of information on healthcare organization and policy | 71.9 | 20.3 | 71.9 |
| 80. I understand how policy influences patient care and own medical practice | 77.6 | 16.0 | 6.4 |
| 81. I appreciate need for doctors to understand and contribute to health policy | 81.2 | 12.1 | 6.7 |

| Applying knowledge and evidence | A   | N   | D   |
|----------------------------------|-----|-----|-----|
| 82. I know sources of evidence-based guidelines on best practice | 70.9 | 18.1 | 11.0 |
| 83. I am aware of healthcare data sources and access to them | 68.0 | 19.2 | 12.8 |
| 84. I appreciate needs for doctors to understand development of health care strategy | 80.1 | 14.9 | 5.0 |

| Making decisions | A   | N   | D   |
|-------------------|-----|-----|-----|
| 85. I know how decisions are made by organizations, individuals and teams | 68.1 | 20.9 | 11.0 |
| 86. I know effective communication strategies within organizations to make effective decisions | 67.0 | 22.3 | 10.6 |
| 87. I make and justify rational decisions | 78.4 | 19.1 | 2.5 |
| 88. My behavior remains consistent with professional and organizational values | 77.7 | 19.1 | 3.2 |
| 89. I contribute to decision-making | 81.5 | 13.9 | 4.6 |

| Evaluating impact | A   | N   | D   |
|-------------------|-----|-----|-----|
| 90. I accept and appreciate suggestions to new ways of working | 84.8 | 12.4 | 2.8 |

Take Home Messages

- This is the first reported leadership curriculum for a resource-constrained setting, which has unique challenges for practice
- A participatory approach to curriculum design is important; therefore, a needs assessment should include all stakeholders, that is, students, faculty and academic leadership
- This study showed agreement between stakeholders on need for a formal integrated, longitudinal leadership curriculum that can capitalize on existing opportunities
Notes On Contributors

KULSOOM GHIAS is an Associate Professor in the Department of Biological and Biomedical Sciences at the Aga Khan University. She is currently the Co-chair of the Undergraduate Medical Curriculum Committee at AKU and has an interest in curriculum development.

REHANA REHMAN, MBBS, MPhil, PhD, is an Assistant Professor of Physiology in the Department of Biological and Biomedical Sciences at the Aga Khan University. Most of her research focuses on medical education, community awareness and reproductive health.

SANIYA R SABZWARI is an Associate Professor, Department of Family Medicine at the Aga Khan University. She is a Fellow of the American Academy of Family Practice and has a Master's in Medical Education. She is Co-chair of the Undergraduate Curriculum Committee at AKU and is interested in curriculum innovation.

FAIZA ALAM is a Senior Instructor in the Department of Biological and Biomedical Sciences at the Aga Khan University. She is focused on identifying gaps in the curriculum and development of new ways to enhance student learning.

ALIZEH ABBAS is a fourth year medical student at the Aga Khan University Medical College. She has an interest in the fields of Surgery and Public Health and believes it is imperative to incorporate leadership in the undergraduate medical education curriculum.

PREET AYOUB SHAIKH is a final year medical student at the Aga Khan University Medical College. She is planning to pursue a career in General Surgery and is a strong proponent of student involvement in curricular development.

USMAN TARIQ SIDDIQUI is a graduate of the Aga Khan University Medical College and was working in the Department of Biological and Biomedical Sciences at the time this study was conceived and initiated. He is currently a general surgery resident at the University of Connecticut. He has strong interest in medical education and public health.

Acknowledgements

The authors gratefully acknowledge the contributions of Ali Faisal Sultan and Mishka Ahmed in data collection.

Bibliography/References

Abbas MR, Quince TA, Wood DF, & Benson, J. (2011). Attitudes of medical students to medical leadership and management: a systematic review to inform curriculum development. BMC Medical Education, 11(1), 1.

https://doi.org/10.1186/1472-6920-11-93

Academy of Medical Royal Colleges & NHS Institute for Innovation and Improvement (2009). Medical Leadership Curriculum.
Academy of Medical Royal Colleges & Improvement NHS Institute for Innovation and Improvement (2010). Medical Leadership Competency Framework Enhancing Engagement in Medical Leadership.

Agrawal JR, Huebner J, Hedgecock J, Sehgal AR, Jung P, & Simon, S. (2005). Medical students' knowledge of the US health care system and their preferences for curricular change: a national survey. Academic Medicine, 80(5), 484-488.

https://doi.org/10.1097/00001888-200505000-00017

Branson, C. (2007). Effects of structured self-reflection on the development of authentic leadership practices among Queensland primary school principals. Educational Management Administration & Leadership, 35(2), 225-246.

https://doi.org/10.1177/1741143207075390

Dass TK, & Parks, S. (2006). Leadership can be taught: a bold approach for a complex world: JSTOR.

Eagly AH, & Johannesen-Schmidt, M. (2001). The leadership styles of women and men. Journal of Social Issues, 57(4), 781-797.

https://doi.org/10.1111/0022-4537.00241

Goleman D, Boyatzis RE, & McKeel, A. (2002). The new leaders: Transforming the art of leadership into the science of results. London: Little, Brown

Khan, M. (2016, October 26). Gender gap index puts Pakistan in second-last place. Dawn News. Retrieved from https://www.dawn.com/news/1292347

Kohn, L. (2004). Academic health centers: leading change in the 21st century: National Academies Press.

Kolb AY, & Kolb, D. (2012). Experiential learning theory Encyclopedia of the Sciences of Learning (pp. 1215-1219): Springer.

Kolb, D. (2014). Experiential learning: Experience as the source of learning and development: FT press.

Kurji Z, Premani ZS, & Mithani, Y. (2016). Analysis of the health care system of Pakistan: Lessons learnt and way forward. Journal of Ayub Medical College Abbottabad, 28(3), 601–604.

Martins HMG, Detmer DE, & Rubery, E. (2005). Perspectives on management education: an exploratory study of UK and Portuguese medical students. Medical Teacher, 27(6), 493-498.

https://doi.org/10.1080/01421590500046726

McKenna MK, Gartland MP, & Pugno, P. (2003). Development of physician leadership competencies: perceptions of physician leaders, physician educators and medical students. The Journal of Health Administration Education, 21(3), 343-354.

Novack DH, Epstein RM, & Paulsen, R. (1999). Toward creating physician-healers: fostering medical students' self-awareness, personal growth, and well-being. Academic Medicine, 74(5), 516-520.

https://doi.org/10.1097/00001888-199905000-00017
O'Connell MT, & Pascoe, J. (2004). Undergraduate medical education for the 21st century: leadership and teamwork. Family Medicine, 36 Suppl, S51-56.

Parks, S. (2005). Leadership can be taught: A bold approach for a complex world: Harvard Business Review Press.

Quince T, Abbas M, Murugesu S, Crawley F, Hyde S, Wood D, & Benson, J. (2014). Leadership and management in the undergraduate medical curriculum: A qualitative study of students' attitudes and opinions at one UK medical school. BMJ Open, 4(6), e005353.

https://doi.org/10.1136/bmjopen-2014-005353

Rabinowitz HK, Babbott D, Bastacky S, Pascoe JM, Patel KK, Pye KL, Rodak Jr J, Veit KJ & Wood, D. (2001). Innovative approaches to educating medical students for practice in a changing health care environment: the National UME-21 Project. Academic Medicine, 76(6), 587-597.

https://doi.org/10.1097/00001888-200106000-00007

Rehman R, Katpar S, Khan R, & Hussain, M. (2015). Financial wellness awareness: A step closer to achieve Millennium Development Goals for Pakistan. Pakistan Journal of Medical Sciences, 31(1), 49.

Spurgeon P, & Down, I. (2010). Guidance for undergraduate medical education: Integrating the medical leadership competency framework, Enhancing engagement in medical leadership: NHS Institute for Innovation and Improvement.

Stoller, J. (2008). Developing physician-leaders: key competencies and available programs. Journal of Health Administration Education, 25(4), 307-328.

Stoller, J. (2009). Developing physician-leaders: a call to action. Journal of General Internal Medicine, 24(7), 876-878.

https://doi.org/10.1007/s11606-009-1007-8

Stoller JK, Taylor CA, & Farver, C. (2013). Emotional intelligence competencies provide a developmental curriculum for medical training. Medical Teacher, 35(3), 243-247.

https://doi.org/10.3109/0142159X.2012.737964

Tibbitts, G. (1996). Leadership education for medical students. Physician Executive, 22(9), 31-35.

Varkey P, Peloquin J, Reed D, Lindor K, & Harris, I. (2009). Leadership curriculum in undergraduate medical education: A study of student and faculty perspectives. Medical Teacher, 31(3), 244-250.

https://doi.org/10.1080/01421590802144278

Appendices
Declarations

The author has declared that there are no conflicts of interest.

This has been published under Creative Commons "CC BY 4.0" (https://creativecommons.org/licenses/by-sa/4.0/)

AMEE MedEdPublish: rapid, post-publication, peer-reviewed papers on healthcare professions’ education. For more information please visit www.mededpublish.org or contact mededpublish@dundee.ac.uk.