

Multidisciplinary leadership training for undergraduate health science students may improve Ugandan healthcare

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Background. Community-based education research and service (COBERS) is a platform for embedding progressive transformative leadership and research-related medical education in Uganda. The leadership development programme (LDP) developed at Mbarara University of Science and Technology (MUST), Uganda is a key component of COBERS. Health science students at MUST are equipped by means of the LDP with leadership knowledge and skills, and a positive attitude towards leadership and rural communities. The programme involves employing interactive learner-centred education techniques, with the opportunity to implement these skills in a community setting immediately after the training.

Objective. To assess the students' self-reported perception and effectiveness of the precommunity placement LDP at MUST and its impact during the community clinical placement, and to measure the self-reported improvement of students' knowledge and their application of leadership skills in the community. The results of the evaluation will improve and build on this educational programme. The study also evaluated the effectiveness of the preplacement leadership training course for undergraduates at MUST, as reported by students.

Methods. The programme evaluation of the LDP used quantitative pretest and post-test measures and qualitative data from focus group discussions to enrich the evaluation. Data were collected from students before and after the 1-week leadership training course using the same self-administered questionnaire. Variables were then compared to evaluate the impact of the LDP.

Results. Prior to the intervention, only 14% of the participants had ever attended a leadership training session. There was significant self-reported change in the task accomplishment skills, interpersonal relationship skills and quality of leadership.

Conclusion. The results suggest that the LDP may increase leadership skills among health science students to improve healthcare in Uganda. Our study recommends that this leadership programme be considered for use by Ugandan medical training faculties and similar environments elsewhere.

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The Ugandan Ministry of Health (MOH) identified lack of leadership and management skills, rather than lack of resources, as the main reason for poor healthcare delivery in the country.^[1] Healthcare professionals, as an integral component of Uganda's healthcare system, receive a high level of training to develop technical skills to provide appropriate care to the population. These professionals were, however, often found lacking in critical leadership knowledge and skills.^[2-4] Because of this deficiency, health workers may fail to deliver quality healthcare services, resulting in patients resorting to unsafe methods of treatment. Poor leadership and management skills have led to mishandling of resources, which has also impacted on the health sector.^[5] Quality healthcare service delivery to the community in Uganda continues to be a challenge.

The MOH responded to the lack of leadership skills by providing in-service training to improve these skills of healthcare workers who are already in service. Mbarara University of Science and Technology (MUST), Uganda responded to the gap by creating a leadership training programme for all undergraduate students pursuing a Bachelor's degree in nursing, medicine and surgery, pharmacy, and medical laboratory science in the Faculty of Medicine. The objective of the leadership development programme (LDP) was to produce skilled leaders who could confront the healthcare challenges and create a better and healthier community.^[6,7]

The assumption was that the leadership skills taught during a didactic class could be implemented in the community immediately after the training and then later in practice.

In this required leadership and community-based education research and service (COBERS), the 242 undergraduate health science students were

placed in multidisciplinary teams of 7 - 10. Each of the 32 teams was then assigned to a different rural community, with the purpose of working with the community to identify a significant health-related problem where they could intervene. COBERS is a university platform for embedding progressive transformative leadership and research related to healthcare in Uganda.^[8] Prior to the community placements, the health science students were equipped with theoretical knowledge in leadership skills that employed interactive student-based learning. The study analysed the self-reported perceptions of this training and its effect on students during their community placement.

The main objective was to assess the students' perception of the 1-week precommunity placement LDP at MUST. The study was specifically carried out to: (i) assess the self-reported students' leadership skills before and after leadership training; and (ii) assess the self-reported effect of the training on students during and after the community placement.

Methods

Study location

The study was conducted at MUST and at 34 community placement sites. The sites reflected the different levels of healthcare delivery, ranging from health facilities where only basic services were provided, to hospitals where more advanced medical procedures were carried out. The health facilities were in rural hard-to-reach communities in southwestern Ugandan districts. The students remained at the remote sites for a 5-week experience.

Study design and data collection

The study was a programme evaluation using quantitative pretest and post-test self-reported measures, and qualitative data from focus groups to enrich the evaluation. The data were used to evaluate the outcomes of the programme. The quantitative data were collected using a pretested leadership assessment tool composed of 49 questions, e.g. qualities of leadership, personal relationship skills, and task accomplishment skills. It was comprised of three sections with Likert scales and one section with open-ended questions. This article discusses 26 of the questions in the analysis, i.e. those specific to leadership. Six of the questions gathered demographic information. We used a self-administered questionnaire that took ~20 minutes to complete – in a pre-test and post-test format. It was administered for the first time 1 week before the training began, and the second time during the last week of the 5-week clinical course at the community placement site. Codes instead of names of respondents were used for purposes of confidentiality.

The tool was developed by the team, and pretested among students who had the same characteristics as those who were being studied, except that they had not yet participated in COBERS and would not take the course in the year of the study. It was administered to 10 students (male and female) from all the health science courses at MUST. They were asked, while completing the tool, to think out loud for every question they read and answer. Notes were taken and the tool was reviewed for errors. The researchers also noted the time taken to complete the tool. The abovementioned information was used to improve the tool.

The qualitative data were collected during focus group discussions (FGDs). There were four FGDs, each attended by 8 - 12 students. The FGDs took place after the students returned from their community placement. The groups were a purposive convenience sample of students who were willing to meet on a Saturday for the discussion. The researchers ascertained that someone from every community group (32 sites) was included, with a mix of male and female students. After the sample signed informed consent forms, the FGD leaders used an interview consisting of six open-ended questions, in which the students were asked to share their experiences from the LDP and those related to working as a team. The FGDs were tape recorded.

Analysis

Quantitative data were analysed using the Statistical Package for the Social Sciences 20 (SPSS 20; IBM Corp., USA). Quality of leadership, personal relationship skills and task accomplishment skills were examined to measure

change of perceptions after the intervention. Pre- and post-intervention scores were matched, means and standard deviations were calculated, and *t*-tests were used to examine the statistical significance of these changes.

Qualitative data were transcribed, read and reread by the researchers. Themes were identified based on the quantitative data schema. The themes were: quality of leadership, personal relationship skills, and task accomplishment skills.

Ethical considerations

The study protocol was reviewed and approved by the MUST institutional review committee. Permission was obtained from the dean of the Faculty of Medicine and the co-ordinator of the community-based medical education programme. Informed consent was obtained from all respondents. None of the respondents was obligated to participate in the study and lack of participation had no impact on their course grade. The information collected was used only for the intended evaluation and only reported in the aggregate.

Study limitations

Although carefully planned, there were limitations to the study. Data collected relied on reports given by the study participants. The study would have presented the impact of the course better if we had provided both subjective and objective information.

Results

Demographic characteristics

Of the 242 students participating in the course, 152 (62%) returned both the pretest and post-test. The sample was representative – 72% males and 28% females. Of the respondents, 31% were medical students, 37% medical laboratory science students, 14% nursing students, and 18% pharmacy students. Thirty-five percent of the respondents had a post-secondary education certificate or diploma. Only 14% of the respondents had ever before attended leadership training.

Qualities of leadership

Students were asked to rank themselves with regard to specific leadership qualities, such as self-confidence, their vision and extent of understanding implications for the community, importance of coalition building, and listening skills. Table 1 shows the results of comparisons between pre- and

Table 1. Changes in personal perceptions of self for quality of leadership*

Student	Quality	Pre-intervention, mean (SD)	Post-intervention, mean (SD)	t-value	p-value
1	I am confident of meeting most challenges and emerging intact and feeling good about myself	3.6250 (0.90696)	4.0938 (0.81752)	-2.611	0.014 [†]
2	I have a vision of where we ought to be going as a group, community, society, people	3.0909 (1.23399)	3.8788 (1.05349)	-3.116	0.004 [†]
3	I am constantly excited by the learning process, which stretches out before me as far as I can see	3.6875 (1.11984)	3.7500 (1.10760)	-0.239	0.813
4	I am constantly amazed at how I pick out the very broadest implications of enterprises and projects that others see in narrow terms	3.3333 (0.95743)	3.8788 (0.96039)	-2.796	0.009 [†]
5	I see the way to success is through steady coalition building	3.6452 (1.05035)	4.2581 (0.77321)	-2.608	0.014 [†]
6	I see great wisdom in building the capabilities of others, empowering them, and motivating them to do their best	4.0303 (0.98377)	3.9697 (0.98377)	0.297	0.768
7	I am an active, effective listener; people seek me out as a listener	3.4848 (1.00378)	3.9394 (0.93339)	-2.390	0.023 [†]
8	I have the courage to take on what is right, regardless of my critics and detractors	4.0312 (0.99950)	4.0625 (0.91361)	-0.197	0.845

*Using pretest and post-test scores with a range of 1 - 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent).
[†]p<0.050 (primary research data).

post-intervention ratings of participants' leadership qualities. Four of the seven leadership qualities showed statistically significant improvement, while three showed little change. For the latter, the mean was initially high. There was an improvement in participants' perceptions about the importance of coalition building, with an increase in mean rating from 3.65 pre-intervention to 4.23 post intervention (statistically significant; $t=2.608$; $p<0.05$).

At the end of the community placement, a qualitative assessment was undertaken using FGDs to better understand how students implemented their leadership. During the FGDs the importance of coalition building was described by several of the students:

'The training also promoted my team, co-operative people, and different work capability as I had to work with different people with different characteristics.'

'We saw how much everybody is contributing, and I realised we can't do medicine alone.'

After the intervention, participants self-reported to have a better vision of where they ought to be going as a group, community, and society. This improvement was shown by the increase in the pre-intervention mean from 3.09 to 3.88 after the intervention (statistically significant; $t=3.116$; $p<0.05$).

Furthermore, participants' confidence for meeting most of the challenges also increased from 3.63 pre-intervention to 4.09 post intervention (statistically significant; $t=2.611$; $p<0.05$). Students felt that the course helped to improve their confidence in their ability to work in the community. This argument was reflected in the statement below:

'It was very helpful to us because actually we learnt very many activities that helped us to carry out analysis in the community. For example, root cause and stakeholder analysis as in all those things we learnt during the workshop they gave us a background knowledge that helped us to carry out our activities in the community successfully.'

Personal relationship skills

Table 2 presents the pre- and post-intervention ratings of personal relationship skills of the respondents. Four of the five ratings were significant and the fifth showed positive change.

Results indicate an improvement in participants' perception of the skill of helping groups to maintain discipline and to direct them towards achievement, while suggesting ways in which all members of a group could participate. The mean rating of this participant skill increased from 3.23 to

4.00 after the intervention (statistically significant; $t=3.430$; $p<0.05$). The improvement was also depicted in the following statement:

'I got to know it is not easy for people who have grown up in different families to be brought together, and then you want things to move smoothly.'

There was also improvement in participants' skills to facilitate interpersonal and group relationships to help the group to be very productive. The students reported to have learnt how to teach by example and how to make these relationships visible. This is shown by the statistically significant increase from a mean of 3.38 to 3.75 after the intervention ($t=1.459$; $p<0.05$).

In the FGDs a student emphasised how the leadership training helped:

'Attitude, that is to say, how to accommodate different people with different personalities and be tolerant, really helped me in my interpersonal relationships.'

They furthermore reported improvement in the skill to mediate for others, and helping to find and reinforce the common ground on which solutions could be built. There was also a statistically significant increase in mean skill from 3.22 to 3.73 after the intervention ($t=2.283$; $p<0.05$).

A student noted:

'Even when we disagreed, one had a basis of argument, like we learnt from the training. It helped us know what to do in case of breakdowns and was a basis to streamline and check on how to agree and disagree.'

Results also showed that the participants' skills to elicit information and ideas by asking open-ended questions were perceived to have improved significantly, with a mean increase from 3.28 to 3.78 after the intervention ($t=2.374$; $p<0.05$).

Participants also reported an improvement in listening skills after the intervention, with mean pre-intervention and post-intervention skills of 3.48 and 3.94, respectively ($t=2.390$; $p<0.05$).

Task accomplishment skills

Students also scored themselves in task accomplishment skills before and after the leadership training. These scores are presented in Table 3. All eight of the skills showed significant improvement. The results indicate that the participants' skills of seeking information and clarifications to shed light on ideas and suggestions improved. The difference between the pre- and post means was statistically significant (3.5 - 4.07; $t=3.138$; $p<0.05$).

Table 2. Changes in personal perceptions with regard to personal relationship skills*

Student	Skill	Pre-intervention, mean (SD)	Post-intervention, mean (SD)	t-value	p-value
1	I understand the nature of power; I exercise and respect power	3.5455 (0.93845)	3.8788 (0.85723)	-1.727	0.094 [†]
2	I elicit information and ideas by asking open-ended questions	3.2812 (1.11397)	3.7812 (0.83219)	-2.374	0.024 [‡]
3	I provide others with clear feedback, reinforcing positive contributions, clarifying and confronting as is helpful	3.6667 (0.81650)	3.7273 (1.00849)	-0.285	0.778
4	I mediate for others, helping them find and reinforce the common ground on which solutions can be built	3.2000 (0.96132)	3.7333 (0.98027)	-2.283	0.030 [‡]
5	I facilitate interpersonal and group relationships, teaching by example, and by making these relationships visible I provide both knowledge and skills about productive behaviour	3.3750 (1.07012)	3.7500 (1.10716)	-1.459	0.005 [‡]

*Using pretest and post-test scores with a range of 1 - 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent).

[†] $p<0.100$ (primary research data).

[‡] $p<0.050$ (primary research data).

In the FGDs the participants communicated their experiences:

'I also learnt that if you have not involved the community in whatever you implement, they will destroy it. You must bring them on board and they become serious stakeholders. They are the ones suggesting the implementations that will work.'

The students reported that by seeking more information with clarification they had an improved understanding of community health-seeking behaviour, and could work better with the community to identify the correct programmes for implementation:

'Even their health-seeking behaviours were poor as people never sought treatment, and had a perspective that these were spirits cast on them by people who never wished them good; who never wished them well ...'

There was a self-reported statistically significant increase in participants' skills of effective communication. The mean ratings of communication skills increased from 3.44 to 3.94 after the intervention ($t=2.104$; $p<0.05$).

During the FGDs the students also emphasised that:

'Even communication skills were improved, so now as you communicate with a colleague you know what to say and what not to say.'

Participants also reported a statistically significant improvement in idea elaboration, with a pre-intervention mean of 3.44 and post-intervention mean of 4.06 ($t=3.215$; $p<0.05$). This is illustrated in statements, such as the following:

'It was important because the skills and knowledge I acquired, like mobilisation, scanning, aligning, communication skills such things, those are the very things we used when we reached the community.'

Furthermore, participants' reported that their skills of initiating ideas, actions, procedures and solutions had improved. With a pre-intervention mean of 3.38 and post-intervention mean of 4.00, it is statistically significant ($t=3.056$; $p<0.05$).

As shown in Table 3, there was significant change in the participants' skills with regard to analysing ideas, tasks and processes, represented by the

pre- and post-intervention means of 3.35 and 4.09, respectively (statistically significant; $t=4.190$; $p<0.001$). Participants' skills in diagnosing difficulties also improved, with an increase in the mean rating from 3.39 prior to the intervention to that of 4.03 after the intervention (statistically significant; $t=3.566$; $p<0.001$).

Results also indicate an improvement in participants' management skills, using a combination of planning, task assignment, and guidance to accomplish goals after attending the leadership training, with a pre-intervention mean of 3.25 and a post-interventional mean of 4.22 (statistically significant; $t=4.550$; $p<0.001$). In addition, there was a self-reported improvement in evaluating progress, process and products, with a mean of 2.79 before the intervention and 3.76 thereafter (statistically significant; $t=4.197$; $p<0.001$).

Discussion

This study found that in all three leadership areas, the participants self-reported statistically significant improvement in their knowledge and application of the knowledge. The results suggest that scholars self-reported a significant improvement in their skill levels in all 15 competency areas examined. The preplacement course taught them useful leadership skills, which they immediately used, having the opportunity to increase their learning through direct application in the community. In 16 of the 20 competency skills examined, there was a statistically significant improvement; in the others they remained the same or showed a slight improvement.

Research suggests that leadership training among public health officials is essential, given the growing complexity of national healthcare systems.^[1,9] However, in most low-resource countries poor leadership remains a challenge and contributes to the failure of the healthcare system. Workshops to improve leadership skills were used successfully in Nigeria to improve healthcare delivery.^[10] For Uganda, problems identified in providing quality healthcare included: deficient infrastructure, heavy disease burden, lack of rural health workers, a demanding workload, and a poor ratio of health workers to the population.^[11] Improving leadership skills among health workers could help to solve many of these different challenges.

Table 3. Changes in personal perceptions for task accomplishment skills*

Student	Skills	Pre-intervention, mean (SD)	Post-intervention, mean (SD)	t-value	p-value
1	I initiate ideas, actions, solutions, and procedures	3.3750 (0.90696)	4.0000 (0.84242)	-3.056	0.005 [†]
2	I elaborate on ideas, using examples and definitions	3.4375 (0.91361)	4.0625 (1.01401)	-3.215	0.003 [†]
3	I communicate ideas effectively	3.4375 (1.04534)	3.9375 (1.01401)	-2.104	0.044 [†]
4	I co-ordinate ideas, activities, relationships, making sense out of the piece	3.2500 (0.91581)	4.0938 (0.92838)	-4.190	0.000 [‡]
5	I diagnose the sources of difficulties	3.3939 (0.99810)	4.0303 (0.80951)	-3.566	0.001 [‡]
6	I summarise for the group, restating progress and offering a decision or conclusion for consideration	3.3030 (1.10354)	3.7576 (0.93643)	-1.936	0.062 [§]
7	I evaluate progress, process and products, holding them up to comparison with standards or expectations	2.7931 (0.81851)	3.7586 (1.02313)	-4.197	0.000 [‡]
8	I manage, using a combination of planning, task assignment, and guidance to accomplish goals	3.2500 (1.04727)	4.2188 (0.87009)	-4.550	0.000 [‡]
9	I seek information and clarification to shed light on ideas and suggestions	3.5000 (1.01600)	4.0625 (0.87759)	-3.138	0.004 [†]

*Using pretest and post-test scores with a range of 1 - 5 (1=poor, 2=fair, 3=good, 4=very good, 5=excellent).

[†] $p<0.050$ (primary research data).

[‡] $p<0.001$ (primary research data).

[§] $p<0.100$ (primary research data).

Sherk *et al.*^[11] found that the development of qualified and able public health leaders using a team approach was a critical step in building the infrastructure to address public health challenges. This applied to all countries, including resource-poor countries, such as Uganda. They used a virtual web-based programme and face-to-face interventions that allowed a team to identify and address issues, and then implement what they learnt to successfully create change.^[11] Results suggest that leadership can improve with knowledge and by implementing it in a multidisciplinary working team. The students were generally successful in creating change in these isolated and very-low-resource communities, which might be attributed to their new leadership skills.

These results agree with those of O'Neil^[12] and Saleh *et al.*^[9] that good leadership and management can be learned and practised. O'Neil^[12] found that, worldwide, the LDP made a profound difference in health managers' attitudes toward their work. Strategies that have been put in place to improve health system challenges included leadership training among healthcare workers in Uganda.^[9] In a modular work-based training model Matovu *et al.*^[2] found that having a programme model that combined both educational and work-based training was very effective in strengthening the capacity and competency of Ugandan health workers.^[1] MUST's approach was unique in that they saw the importance of using the LDP for undergraduate students before these students practised in the community. As with the models of Matovu *et al.*^[4] and Sherk *et al.*,^[11] they also reinforced learning by having the students implement it immediately in the community with specific projects. Medical Education for Equitable Services for All Ugandans (MESAU) has emphasised the need for leadership skills to be taught to undergraduate students. MESAU and the ministries of health and education have designed minimum competencies for medical education, of which leadership and management skills is one of the nine competencies.^[8]

Research has identified that teamwork is one of the most important skills for effective clinical practice, with better clinical outcomes in acute and chronic care settings, and fewer medical errors. Successful teams have good leadership.^[13,14] O'Neil^[12] noted that for leadership to be effective it should not use the traditional approach, focusing on top leaders, leadership traits and characteristics, but rather focus on the development of teams that can identify problems, find solutions, and obtain results.

This training proposed a response to the identified lack of leadership and management skills recognised by Uganda's MOH and the gap identified internationally by the Lancet Commission in 2010.^[15] One action that

might improve the quality of healthcare in Uganda is the LDP, an important component in molding healthcare graduates. The positive results of this study might be a basis for recommending the leadership course as part of COBERS to all Medical Education Partnership Initiative (MEPI) members, a consortium of health science universities.

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