

# Leadership development facilitated by the “sandwich” and related glaucoma fellowship programs

Glaucoma  
fellowship  
programs

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Received 27 October 2020

Revised 28 January 2021

21 February 2021

Accepted 22 March 2021

## Abstract

**Purpose** – The purpose of this paper is to evaluate leadership training in the Sandwich Glaucoma Fellowship (SGF), a program in which fellows learn skills in a developed world institution and their home country to become leaders in glaucoma care.

**Design/methodology/approach** – This paper is a retrospective, qualitative and quantitative evaluation. Participants of the SGF between 2007 and 2019 were provided a survey eliciting demographic information, leadership training exposure, development of leadership competencies and feedback for the fellowship program.

**Findings** – Seven of nine alumni responded. The fellowship strongly impacted leadership competencies including integrity (8.8, 95% CI 7.8–9.8), work ethic (8.64, 95% CI 7.7–9.6) and empathy (8.6, 95% CI 7.7–9.5). A total of 85% of alumni indicated positive changes in their professional status and described an increasing role in mentorship of colleagues or residents as a result of new skills. Lack of formal leadership training was noted by three respondents. Informal mentorship equipped fellows practicing in regions of Sub Saharan Africa with competencies to rise in their own leadership and mentoring roles related to enhancing glaucoma management. Suggested higher-order learning objectives and a formal curriculum can be included to optimize leadership training catered to the individual fellow experience.

**Originality/value** – Leadership is necessary in health care and specifically in the context of low- and middle-income countries to bring about sustainable developments. The SGF contains a unique “Sandwich” design, focusing on the acquisition of medical and leadership skills. This evaluation outlines successes and challenges of this, and similar fellowship programs. Other programs can use a similar model to promote the development of skills in partnership with the fellows’ home country to strengthen health-care leaders.

**Keywords** Health education, Leadership, Ophthalmology, Global health, Glaucoma management

**Paper type** Research paper

This evaluation of the SGF was made possible by many alumni who participated in this survey and who are leaders in glaucoma care. Thanks are due to Drs. Faith Masila, Dan Kiage, Jeremie Agre, Girum W. Gebreal, Sheila Marco, Testfaye Tadesse and others. This project would not have been possible without them.

This project has received no funding or sponsorship. Karim F. Damji has received funded grants from Alberta Innovates and Neurosciences, Rehabilitation and Vision SCN Seed Grant Competition for projects titled: Degenerative Eye Condition VR Experience and The Burden of Vision Loss in Stroke: Barriers to Care Experienced by Stroke Survivors in Alberta.



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## Introduction

The “Sandwich fellowship” is an educational model that allows fellows from developing countries to learn skills in a developed world institution and their home country, in parallel with institutional capacity development at their home institution (Kassam *et al.*, 2009). The Sandwich Glaucoma Fellowship (SGF) was first trialed in 2007 with the University of Ottawa Department of Ophthalmology partnering with the Aga Khan University Hospital in Nairobi, Kenya (Kassam *et al.*, 2009). Since this time, six participants have been enrolled in the fellowship programs, and three have experienced similar mentorship while undergoing a related fellowship programs in Glaucoma. The SGF aims to train ophthalmologists in advancing glaucoma clinical skills, developing leadership skills and improving awareness, detection and management of glaucoma in Sub-Saharan Africa (SSA) (Kassam *et al.*, 2009). Leadership training was comprised of a combination of formal training, i.e. conferences and/or courses and informal training, i.e. attendance at department meetings and/or mentorship with preceptors. In these situations, training was customized for each fellow and did not follow a standard approach. After their training, fellows return to their home institution and may play a role in educating or mentoring other specialists, or leading projects or teams dedicated to glaucoma management and care (Kassam *et al.*, 2012, 2009). Enhancing leadership skills is, therefore, an essential component of the SGF and prepares fellows to return to their home institution and participate in these roles as well as take on other roles (Kassam *et al.*, 2012). Leaders working in collaboration with other professionals are essential to address the shortage and improve the quality of eye care services in SSA. This study aims to determine the impact of leadership training that was provided to fellows of the SGF, or fellows from SSA who received leadership and mentoring as part of a similar glaucoma fellowship and identify relevant strengths and weaknesses in this education for future improvements.

## Methods

Approval for this study was obtained from the University of Alberta Health Research Ethics Board. Data collection and analysis were conducted by two independent researchers. Nine previous SGF, or those who received similar leadership training, were contacted through email in June 2019 and consented to participate in a survey aimed at investigating leadership skills and competencies developed throughout the fellowship.

A survey was used to elicit responses. A literature search was conducted to determine similar fellowship program evaluations focusing on fellows who partook in experiences between a developed world and developing world institution. Questions were modeled from the Afya Bora Leadership training program survey evaluating leadership capabilities and included questions regarding essential elements of leadership development and competencies for health-care professionals (Monroe-Wise *et al.*, 2016; Sonnino, 2016). This survey was conducted in English and completed by participants through REDcap survey system or fillable Microsoft Word document. It consisted of 20 questions regarding demographic information, leadership growth and improvement in the fellowship, of which 10 were open-ended questions. This included 18 Likert scale rating sub questions regarding individual leadership abilities and improvements, as well as questions to elicit feedback for changes to be made to the fellowship program. *A survey is attached in Appendix.* Participants were given 2 months to respond to the survey with multiple reminders.

Once data was collected, identifying information in the survey answers was removed. Qualitative data analysis using an open coding technique for content analysis was conducted with two individual raters. Raters familiarized themselves with the data and developed an initial set of categories recognizing key themes stated by participants. These

Category code	Titles and possible themes to be included
0	Does not fit into any theme
1	Additional training/desire <ul style="list-style-type: none"> <li>● Additional training years/courses (both before and after)</li> <li>● Desire for pursuing additional education</li> </ul>
2	Evolution of a leader role <ul style="list-style-type: none"> <li>● Change in professional status</li> <li>● Preexisting or change in leadership role</li> <li>● Creation of new programs/developments</li> </ul>
3	Skills/components/experiences in the fellowship: <ul style="list-style-type: none"> <li>● Acquired leadership experience</li> <li>● Attending workshops</li> <li>● Amount of leadership training</li> <li>● Leadership training content</li> <li>● Leadership skills learned or improvements</li> </ul>
4	Informal leadership training (within fellowship): <ul style="list-style-type: none"> <li>● Informal leadership training</li> <li>● Observation of others' leadership</li> <li>● Ongoing mentoring</li> <li>● Leadership coaching</li> <li>● Mentorship value</li> </ul>
5	"Lack of" formal training (within fellowship – not improvements)
6	Future improvements: <ul style="list-style-type: none"> <li>● Future improvements to training, or future goals</li> </ul>
7	Ongoing professional contacts / collaborations <ul style="list-style-type: none"> <li>● Support from mentor</li> <li>● Support at home institution</li> </ul>
8	Barriers <ul style="list-style-type: none"> <li>● Barriers to leadership</li> <li>● Barriers at home institution</li> </ul>

**Table 1.**  
Codes and categories  
for analysis

categories were reviewed and further refined through careful discussion to create nine mutually exclusive codes (Table 1). Data from participant surveys was fragmented and coded. After one revision stage, raters reviewed fragmented data and independently coded the data which consisted of 118 fragments. There were no major discrepancies. Percent agreement and calculated Kappa using SPSS suggested near perfect agreement, with Kappa value 0.81. Fragments of the data were selected for representation in the report. Descriptive statistics were compiled using SPSS and Microsoft Excel.

## Results

Seven of nine participants answered surveys. Five respondents participated in the SGF, while two underwent similar training. In the latter, one respondent participated in "Sandwich" designed training, while the second participated in training in a developed world Canadian institution with informal leadership training from similar mentors to those in the SGF. As of fall 2019, the mean number of years since previous residency training for participants was approximately 11.5 years, range 16. The mean number of years since SGF training was approximately six years. Demographic data is summarized in Table 2.

In addition to short/long answer questions, the survey elicited responses from participants regarding the impact the SGF had on 18 leadership competencies. Results are recorded in Table 3. Fellows were asked to rate competencies on a ten-point scale from 0–10

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with 0–4 indicating negative impact, 5 neutral and 6–10 positive impact. Six of seven participants rated leadership competencies. It was shown that the fellowship had a mean positive impact on all 18 competencies as rated by the 6 participants. Most strongly impacted leadership competencies were integrity (8.8, 95% CI 7.8–9.8), work ethic (8.64, 95% CI 7.7–9.6) and empathy (8.6, 95% CI 7.7–9.5). Persuasion was the leadership quality found to be least impacted by the fellowship (7.9, 95% CI 6.45–9.35).

With 118 fragments and 2 raters, the Measurement of Agreement, Kappa was found to be 0.81 with an asymptotic standard error of 0.041. Raters agreed upon the coding of 99 fragments. The agreed upon statements were coded as shown in [Table 4](#).

**Table 2.**  
Summary of  
demographic data  
from respondents

Mean age/range	46.1/ 16
Mean number of years since residency/range	11.5/ 16
Mean number of years since SGF training/range	6.1/11
Gender distribution	Male (4) Female (3)
Location of ophthalmology residency training	Kenya (4) Ethiopia (3)
Fellow home country at time of fellowship (3 respondents)	Kenya (2) Côte d'Ivoire
Fellow home country currently (3 respondents)	Kenya (2) Côte d'Ivoire

**Table 3.**  
Leadership  
competencies  
essential to health  
care professionals  
and the rated impact  
from the fellowship

Quality	Mean	Range	95% Confidence interval
Personal development	8.48	3.6	7.25–9.71
Professional development	8.24	3.8	7.11–9.37
Introspection	8.4	3	7.33–9.47
Listening ability	8.2	3	7.16–9.24
Empathy	8.6	3	7.69–9.51
Awareness	8.5	2	7.81–9.19
Persuasion	7.9	5	6.45–9.35
Integrity	8.8	3	7.76–9.84
Authenticity	8.38	5	6.74–10.02
Altruism	8.12	5	6.47–9.77
Equity	8	5	6.50–9.50
Work ethic	8.64	3	7.71–9.57
Role modelling	8.5	3	7.52–9.48
Innovation: being able to develop inspire, challenge the status quo, and focus on a long-term vision	8.5	5	6.60–10.40
Foresight	8.16	3.9	6.99–9.33
Stewardship	8.34	3.8	7.21–9.47
Commitment to continuous improvement and lifelong learning	8.42	3.9	7.24–9.60
Balancing work and personal life	7.3	4	5.93–8.67

Written comments from the open-ended survey questions were most often related to the evolution of the fellow’s leadership role and specific skills gained from their experiences within the fellowship program. A few suggestions for improvements for the program such as more formal leadership training were also made. Themes with representative quotes are highlighted below.

The evolution of the leadership role was a topic acknowledged by all participants. Six of seven or 85% responded “yes” to positive changes in their professional title. The individual who did not note a positive change to their professional role was already appointed as “section head” but became better at their role. The evolution of roles varied; however, six of seven respondents commented that they were involved in mentorship or training of other ophthalmology residents or colleagues or stated the leadership components of the fellowship provided them with adequate skills to do so. These findings suggest that the fellowship did elicit positive changes and provide skills necessary to advance in position or support other learners and colleagues in their home country. One participant described that they are:

“[...] sharing the knowledge and skills learned in glaucoma with colleagues at [their] institution” and are “working with other glaucoma specialists in [their] country and from other countries to train ophthalmologists from [their] country and region to provide better glaucoma services”.

Newly assigned tasks include developing curriculum for glaucoma fellowships, training other ophthalmologists in glaucoma care, mentoring residents and contributing to the creation of national glaucoma guidelines. One ophthalmologist stated:

“I’m mentoring residents now in a more interactive way and putting their interest [at] the center”.

In addition to the quantitative data regarding individual skills and competencies in [Table 3](#), fellows frequently commented about the leadership skills gained through the fellowship in response to open-ended survey questions. Twenty fragments demonstrated specific skills and formal training/components of the fellowship that were focused on leadership skills. Participants specifically commented on skills learned including communication skills, negotiating skills, partnering with industry and funding agencies with more confidence, ability to work as a team and develop healthy relationships as a leader, taking responsibility for actions, decisions and intentions and having a balance between ignoring the details and getting lost in the details. One participant reflection stated:

“I have learned that in order to be a good leader one may need to carry out evaluation of the performance of the department, documenting milestones achieved from the times of the previous leaders to the current leaders [...] This helps in looking back and seeing the goals achieved, sharing them with others to encourage the staff and determine what [...] goals for the future [are] and plan toward achieving them.”

Three participants commented on the lack of a specific formal leadership curriculum throughout the fellowship, but others mentioned specific courses and seminars of value. These included courses from the Canadian Society of Physician Leaders, Physician

Code	0	1	2	3	4	5	6	7	8
Frequency of fragments with agreement between raters	5	7	29	20	11	3	11	8	5

**Table 4.**  
Frequency of agreed upon fragments in the coding process

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Leadership Institute (affiliated with the Canadian Medical Association, the Canadian Conference on Physician Leadership and the Physician Leadership Workshop Organized by the Canadian Medical Association in Ottawa). Throughout the fellowships, courses that were available to fellows differed. Although not all fellows had the same exposure to workshops and courses, one previously accessed course was *Gold College*, a program offered by the University of Alberta Faculty of Medicine and Dentistry that aimed to provide an approach to enhancing leadership capacity by focusing on a self, teams and systems approaches (University of Alberta, 2021).

Eleven fragments focused on the benefits gained from informal leadership training within the fellowship, mostly provided through mentorship. In their responses, six of seven fellows noted informal coaching, mentorship or acquisition of leadership skills from working with supervisors during their fellowship, notably mentioning the value of interacting with the SGF's lead clinician. Although exposure to leadership mentorship was not formalized or standardized, all fellows involved at the University of Ottawa, or the University of Alberta took place in designing a wet-lab for glaucoma and carrying out teaching for residents with their lead mentor. One participant stated:

"I have been exposed to leadership and management of glaucoma in academic and community practice setting where I have seen different leadership styles and [worked] as a team with colleagues, other medical and non-medical staff."

The same participant stated that leadership development was:

"[. . .] made possible by learning practically from the leadership of the head of the department and other preceptors in the glaucoma fellowship."

Many participants acknowledged the utility and value of mentorship.

"My mentor [. . .] is an all rounded expert who has the knowledge of what is required to be a leader not only in the setting where I did my fellowship, but also the actual setting in developing countries like mine. I learned quite a lot from his leadership capabilities in various disciplines."

One stated that informal training through mentorship by the main preceptor was more efficacious than formal training.

Eleven fragments suggested ideas for specific improvements in the leadership components within the fellowship training including formal courses and individualized learning objectives. These were provided by six out of seven participants. One participant felt that in addition to provisions through the fellowship:

"[. . .] leadership development training/courses should be incorporated into residency programs as well."

Feedback also suggested that:

"[it should be made] clear at the beginning of the fellowship that leadership skills acquisition is part of the training," and participants should be "[surveyed regarding] specific leadership skills they feel they lack so that those specific skills can be provided."

Implementing this suggestion would also aid in determining specific courses, workshops and rotations that may benefit the candidate. Three participants mentioned lack of formal leadership training, and three participants also suggested implementing or including formal courses:

"[. . .] lectures on leadership training [. . .] during the fellowship or [. . .] after the fellowship."

Similarly, a suggestion was made to partake in specific rotations or:

“[...] exchange programs with various institutions to learn how an efficient glaucoma service is managed.”

Three of seven participants noted that they had taken leadership training/courses since completion of the fellowship, although one participant was undergoing training at the time of the survey. Ongoing learning, support or mentorship continues to take place for the majority of fellows and was specifically stated by four of seven participants. They stressed the importance of continued collaborations for improvement in their careers. Fellows contributed the following statements:

“I am continuing to communicate with my supervisors as I apply what I learnt in my home country and this provides the necessary mentorship that I require.”

“Developing networks with physicians was necessary for future collaborations in my career.”

“The most useful in terms of my fellowship training is the ongoing coaching and mentoring with my supervisors with several visits at my workplace [...] The ongoing [mentorship] is valuable.”

Fellows were asked to comment about any supports or barriers in their home institutions that may inhibit their ability to act as a leader. Ongoing mentorship was recognized as a support by four of seven responding fellows. This included support from colleagues, hospitals and universities in a fellow's home country and mentors and faculty from the SGF. Barriers to leadership at a fellow's home institution were noted by four of seven fellows. Although barriers varied, those reported included the mindset within an institution and the large number of residents that cause difficulty in personalizing training. One fellow commented on the decentralized organization of the institution, referring to allied professionals being managed under different departments, while eye care remains an interprofessional discipline.

All fellows reported maintaining contact with their primary mentor and other SGF. Five of seven fellows also maintain contact with staff from the developed world host University or other fellows and colleagues training in ophthalmology. Other contacts that have been maintained from meeting during the fellowship included professionals in other fields, ophthalmologists from other universities, individuals from funding agencies, eye banks, meetings and conferences.

## Discussion

Overall, results from our survey demonstrate that the fellowship had a positive impact on leadership skills and professional position for fellows. Most fellows reported advancements in their positions, new mentoring roles and strengthening of personal leadership skills and behaviors. The leadership role in these ophthalmologists is believed to have an effect in educating others; the follow-through effect can enable continued leadership capacity to be built in their settings. The fellowship was effective for fellows to learn leadership competences, and many comments expressed the value of learning from mentors and acquiring skills from the environments that they worked within. Lasting mentorship was identified by four of seven respondents, and all noted that they had maintained contact with their main mentor and other fellows. These relationships offer further room for growth and continued learning. The fellows were able to meet the aspirations of the original intention of the fellowship; however, many found that there was a lack of formal curriculum relating to the development of leadership skills. Suggested formal training included additional lectures, courses pertaining to leadership and identifying learning objectives for specific skills to be developed.

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The “Leader” role has been identified as a necessary quality for the improvement of health care and engagement and collaboration with others in the field of medicine (Dath *et al.*, 2015). In Canada, leadership has been identified as an important skillset of physicians, instituted in early training in medical schools and continued throughout specialty or family physician training (Royal College of Physicians and Surgeons of Canada, 2015). Green *et al.*, recognize the importance of prioritizing leadership development for young ophthalmologists in the early stages of training (Green *et al.*, 2019). Currently, a greater emphasis tends to be placed on the development of clinical and surgical skills, while leadership skills are learned from mentoring, or through more informal experiential learning (Green *et al.*, 2019). In the past five years, the LEADS framework has come to surface and been adopted into practice by many health-care organizations in the country (Dickson and Tholl, 2020). This framework, standardizing leadership capabilities, focuses on five areas, that when applied to practice can address health leadership challenges and can be used to assist health care personnel in learning best practices (Dickson and Tholl, 2020). Areas include: lead self, engage others, achieve results, develop coalitions and system transformation (Dickson and Tholl, 2020). This framework to develop leadership capabilities is acknowledged by numerous health care and physician organizations to benefit health system sustainability and transformation (Dickson and Tholl, 2020). In addition to LEADS, there are many known and developed leadership practices and theories that can be used in physician or health-care leadership (Aij and Teunissen, 2017; Blumenthal *et al.*, 2012; McGonagill *et al.*, 2010). The “lean” leadership system uses five key principles including: improvement culture, self-development, qualification, *gemba* (“golden rules”), and *hoshin kanri* (“policy development”) with a focus on decreasing waste and increasing efficiency (Aij and Teunissen, 2017). Other well-developed frameworks include, *Authentic Leadership Development*, a leadership course taught at Harvard Business that focuses on prior experiences to uncover values, priorities and motivations, and *Center for Creative Leadership* (CCL), a program that includes an assessment of trainees’ leadership skills, challenging participants and supporting participants through feedback and teaching (Blumenthal *et al.*, 2012). These programs stem from leadership best practices that can be integrated into residency or training programs for health care professionals (Blumenthal *et al.*, 2012). Nine general principles have been defined as best practices of leadership training programs in the literature and include:

- (1) reinforcing and building a supportive culture;
- (2) ensuring high-level sponsorship and involvement;
- (3) tailoring goals and approaches of the program to the context;
- (4) targeting programs toward specific audiences;
- (5) integrating all features of the program;
- (6) using a variety of learning methods;
- (7) offer extended learning periods with sustained support;
- (8) encouraging ownership of self-development; and
- (9) committing to continuous improvement (McGonagill *et al.*, 2010).

In the international context, leadership is needed to tackle health system challenges in low- and middle-income countries to bring about sustainable developments (World Health Organization, 2016). The SGF, developed in 2007 aimed to provide comprehensive training in glaucoma care as well as leadership competencies for ophthalmologists practicing in SSA. Training between a developed world and developing world institution aimed to provide fellows with skills, while simultaneously building capacity in their home country to apply



their new skills and carry academic institutions of the developing world into the future (Kassam *et al.*, 2009). The necessity of programs that provide leadership training in African countries has been identified, and it is essential to evaluate these programs to identify the lasting impacts that they may have on global communities (Aagaard *et al.*, 2018; Daniels *et al.*, 2014; Kimball *et al.*, 2019; Ousman *et al.*, 2016; Sherman *et al.*, 2016).

In the literature, few training programs have contained a similar “Sandwich” model or focused on combined medical and leadership skills. One training program, The Afya Bora Consortium, developed in 2009, used a similar model to the Sandwich fellowship and focused on health leadership training for fellows in response to the HIV epidemic (Monroe-Wise *et al.*, 2016). This fellowship found success training fellows with combinations of both didactic sessions, mentorship and networking. Similar to our findings 68% of fellows found their position of work had changed, and 76% of these felt that the change was because of experience gained through the fellowship (Monroe-Wise *et al.*, 2016). Furthermore, this training model also acknowledged the need to cater training to varied competency levels of learners, similar to feedback received in our survey (Ousman *et al.*, 2016). The Afya Bora fellowship demonstrates another example where curriculum was jointly developed with North American trainers to develop capacity for African leaders (Nakanjako *et al.*, 2015).

In line with best practices, tailoring goals of a program to the context and committing to continuous improvement, reflection is necessary to apply skills and grow. The need for personal reflection and discussion has been explored in other leadership training models (Doherty *et al.*, 2018; Kvach *et al.*, 2017). Although our survey responses contained few to no comments relating to the applicability of the fellowship to the cultural context of the fellows, a study by Kyach *et al.* taking place in Ethiopia recommended that the curriculum should be made specific to the Ethiopian context and time for discussion and personal reflection should be provided (Kvach *et al.*, 2017). Another study focusing on the acquisition of health leadership skills in the South African context described the benefit in allowing for personal reflection to understand roles, strengths and weaknesses as leaders and managers to aid in the acquisition of skills (Doherty *et al.*, 2018). Allowing for personal reflection is something to consider for the future of the SGF, especially given that fellows may be learning skills that may need to be applied to their unique cultural contexts.

The “Sandwich” design provides unique ongoing networking and mentorship opportunities for fellows, as many indicated the continued use of mentorship or connections that they had formed throughout the fellowship. Other “sandwich” models have suggested that local mentorship could be an area of enhancement (Kimball *et al.*, 2019). A model that develops skills and promotes learning in partnership with fellows’ home countries has the ability to retain leaders and offer a promising future (Kimball *et al.*, 2019).

There are several limitations to our evaluation. Our study was retrospective in nature, and data was self-reported, which can introduce bias. The time between participation in the fellowship and data collection may have provided an extended period for other influences into a fellow’s career. This may have included other leadership development opportunities. An inductive approach to data analysis allowed themes and theories to be developed; however, some themes lay outside the scope of the research question and needed to be excluded. The knowledge acquired relating to glaucoma management was recognized by participants and these competencies may have acted as a confounding factor leading to their ascent in position. Additionally, the main focus of this study was to evaluate the improvement of leadership skills of fellows; however, fellows provided learning opportunities for the developed world institutions’ staff, faculty and learners. The unique “Sandwich” design allows for ample knowledge transfer from both environments and affords the developed world knowledge of management of glaucoma in the global context.

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This may include surgical techniques and insight into the compassionate care for children in countries such as Kenya and Ethiopia where glaucoma is more prevalent in the pediatric population as compared to North America. Although survey results showed improvement in leadership skills and qualities, our study did not capture data to suggest the applicability of these skills in the cultural context of SSA. Many fellows acknowledged learning leadership and glaucoma skills from their mentors, staff and colleagues during the fellowship; however, they did not state how leadership styles were applied in their settings and there was little data of supports or barriers to implementing these skills. This provides us with little evidence to suggest how leadership skill training can be catered to physicians and ophthalmology fellows practicing in SSA. Although fellows recognized that contacts with mentors and colleagues were maintained after completion of their fellowships, the value of these relationships was not explored in detail. Continued relationships with colleagues are likely to be of value; however, this may be further explored in future evaluations of these training programs.

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### Implications for the future

To evaluate the component of the program that focuses on leadership acquisition in the future, we recognize the need to create formal goals and objectives along with measures of evaluation to be able to assess if these results were achieved. A lack of formal curriculum for developing leadership and management skills can be addressed similarly. Higher-order level learning objectives created in review with a sample of previous fellows have been suggested in [Table 5](#), although we believe that training should be customized to the needs of the learner. In the future, a more structured approach can be adopted for better evaluation of leadership skills although it is important to acknowledge that there are many other factors that play into an individual's development into a leader, and these fall outside the scope of any course or fellowship. In Canada, post-graduate medical education is moving toward a competency based medical education (CBME) perspective although it has been acknowledged that objectively evaluating competencies is difficult, with no valid instruments available (Touchie and ten Cate, 2016). The Canadian system currently integrates "entrustable professional activities" (EPAs) as an approach to assessment of competencies and future studies may provide valuable insights regarding whether EPAs may be of value in assessing leadership competencies (Touchie and ten Cate, 2016).

Currently, this program has trained fellows who believe they have become stronger leaders and have taken on leadership and mentorship roles to provide mentorship, glaucoma

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By the end of the SGF fellows should be able to\*:

- Evaluate existing glaucoma care within their home country and participate in activities that contribute to the effectiveness of health care organizations and systems to optimize delivery of quality glaucoma care
- Allocate finite health care resources (human, financial, IT, etc.) appropriately. Fellows should familiarize themselves with the systems approach to health care delivery pertinent to their future practices
- Manage practice and career effectively, understanding personal limitations, the importance of wellness and seeking out appropriate advice and support
- Conceptualize and be prepared to deliver high quality educational programs relating to the acquisition of glaucoma skills for residents, fellows, ophthalmology colleagues and other health care team members
- Prepare to serve in administration and leadership roles as appropriate

**Table 5.**  
Suggested leadership  
skills objectives for  
SGF fellows

**Note:** \*Objectives are to be catered to personal fellow goals through the duration of the fellowship and should respect and support individual fellow goals

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management training and build leadership capacity in their home institutions. This paper identifies the value of teaching leadership alongside clinical and surgical skills, along with the importance of investigating “sandwich” program designs that have the ability to lead to impactful development of competencies for individuals practicing in developing countries. Leaders and graduates connect and collaborate both regionally and internationally. One regional initiative that SGF have championed is a collaborative East Africa glaucoma community that operates under the auspices of the College of Ophthalmology of Eastern, Central and Southern Africa (COECSA). This is an organization that through leadership in eye care aims to improve the quality of eye care in SSA ([College of Ophthalmology of Eastern, Central and Southern Africa, 2019](#)). Collaboration with other professionals through leadership in SSA is essential to address the shortage and improve the quality of eye care services in this part of the world.

The suggestions elicited from this study can be integrated to amend the SGF for future years and offer suggestions to other leadership training programs. Existing resources available through the International Council of Ophthalmology, Royal College of Physicians and Surgeons Canada and other National and international bodies and civil society organizations can be used to provide formal leadership training for fellows. The LEADS framework and principles as well as other best practices, may be adapted to strengthen development of health-care leaders trained through this fellowship model.

## Conclusions

The SGF trains leaders from SSA countries in glaucoma management while providing leadership skills necessary to train and mentor others in their home countries. This, and similar fellowship designs, allows for further capacity building and lasting improvements in glaucoma care and management. In this study, the value of the leadership education within the SGF, a fellowship that develops leadership and glaucoma skills acquisition in a cultural context, was examined. At this time, the program has been successful in providing training through mentorship and the development of skills, although including an improved formal curriculum and specified objectives with some customization to learner centered needs is likely to improve the learning experience. Fellows who have completed the fellowship believe they have become stronger leaders. The “sandwich” design, thus far, has enabled fellows to continue in the mentorship and sharing of knowledge with residents as well as ophthalmologist colleagues in their home countries. Previous fellows have taken on roles within their institutions, communities and the region of SSA. In the future, a more formalized design and evaluation method will aid in assessing the outcomes related to this teaching model. Other programs can use a similar model to promote the development of skills, both related to leadership and medical management, in partnership with the fellows’ home country to create health-care leaders for a promising future.

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**Appendix****An evaluation of leadership skills supported through the ‘Sandwich’ Glaucoma Fellowship Survey**

If you wish to use this document to submit your answers, please type them in. You may indicate your answers to multiple choice questions by underlining, bolding, highlighting etc. You may indicate your answer to questions with scales by writing your rating beside the question.

Demographic information:

\*Note: specific demographic information or identifying information will not be used in the final report

- Age: \_\_\_\_\_
- Gender: \_\_\_\_\_
- Please specify the number of years since your formal residency training in ophthalmology was completed: \_\_\_\_\_
- Please specify the number of years since the Sandwich Glaucoma Fellowship was completed: \_\_\_\_\_
- Where did you do your ophthalmology training (including fellowships)? Please list.

**Questions relating to the Sandwich Glaucoma Fellowship:**

- (1) In your opinion, did your professional position change as a result of your participation in the Sandwich Glaucoma Fellowship?
- (2) If yes, how did the Sandwich Glaucoma Fellowship affect your position at work?
- (3) Were you satisfied with the amount of leadership training provided during the Sandwich Glaucoma Fellowship, or mentorship after your fellowship studies (applies to participants who did not undergo the Sandwich Glaucoma Fellowship training). Please briefly explain why or why not.
- (4) What formal and informal leadership training were you exposed to a) during your fellowship and b) through informal mentorship provided afterwards? Which forms of training were most helpful to your learning or personal and professional growth?
- (5) Do you feel that one or more individuals has served as a mentor for leadership development during your fellowship? If so, please specify the role this mentor played and the duration of your contact with this individual (i.e. still ongoing, 3 months).
- (6) What if any impact has the exposure to leadership training specifically had for you a) personally and b) in your professional endeavors?  
Please be as specific as possible in responding e.g. in what ways do you feel you may have grown? Did the training help you to take on additional roles/responsibilities within an organization, make changes to governance or take on projects etc?
- (7) How do you think the leadership training in the Sandwich Glaucoma Fellowship has impacted the following competencies (rate from 0-10 with 0-4 a negative impact, 5 neutral and 6-10 a positive impact.)
  - Personal development
  - Professional development
  - Introspection (getting to know oneself)
  - Listening ability

- Empathy
  - Awareness
  - Persuasion
  - Integrity
  - Authenticity
  - Altruism
  - Equity
  - Work ethic
  - Role modeling
  - Innovation: being able to develop, inspire, challenge the status quo, and focus on a long term vision
  - Foresight
  - Stewardship
  - Commitment to continuous improvement and lifelong learning
  - Balancing work and personal life
- (8) Have you taken any leadership courses since your graduation? If yes please elaborate.
- (9) How has your ability to train/mentor others changed after participating in the Sandwich Glaucoma Fellowship. Please be specific in regards to if you are training/mentoring others formally or informally and in what way.
- (10) In your institution, do you encounter any barriers or forms of support that limit or enhance your ability to act as a leader?
- (11) What would you suggest are ways in which leadership training could be strengthened for future glaucoma fellows? Please specify types of training, specific learning opportunities etc.
- (12) Do you maintain any relationships with people you met through the Sandwich Glaucoma Fellowship? Please check all that apply. Can be personal or professional.
- Staff from the developed world host university
  - Primary mentor
  - Other Sandwich Glaucoma Fellows
  - Fellows and colleagues training in ophthalmology from the developed world host university
  - Other: Please specify (eg. those you may have met at conferences, techs/nurses etc)
- (13) If so, how do you communicate with these individuals? Please check all that apply.
- Email
  - Telephone
  - Other Sandwich Glaucoma Fellows
  - In person
  - Facebook
  - Other: Please specify:
- (14) Please feel free to share any other thoughts regarding leadership development for yourself or others that you feel may be helpful for us to know.

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- (15) Please feel free to share any other thoughts regarding leadership development for yourself or others that you feel may be helpful for us to know.
- View summary report prior to publication
  - Be sent study findings and/or report after study is completed/after publication
  - Receive acknowledgement for contributions to the paper (including name, designation, and participation in the Sandwich Glaucoma Fellowship)

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