23. On the Egyptian-German transfer of medical knowledge

On cooperation, mobility, and similarities

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This chapter reflects on the century-long education cooperation between Germany and Egypt, focusing on medicine. Taking global structural challenges, like the health care providers, the Covid-19 pandemic, and the global flow of migration into account, the chapter chronicles how a triangle of cooperation between Berlin, Cairo, and Greifswald engages with those challenges and what possible future lies ahead. This chapter lays the background for the medical collaboration between Egypt and Germany, particularly emphasizing the challenges and the future.

The long history of German-Egyptian academic exchange and mobility

Throughout the past 200 years, there has been ongoing scientific mobility between Egypt and Germany in many fields. During the era of Khedive Ismail, about 100,000 foreigners settled in Cairo and Alexandria. The majority were Germans, among them archaeologists, with German interest in Egyptology playing an essential role in creating the academic bridge. (Yehia 2015). As a long-term result, German scientists disseminated knowledge about ancient Egyptian civilization. Despite the numerous benefits, this era left us with an ongoing conflict regarding the Egyptian treasures excavated and exhibited in European museums. Berlin takes pride in the beautiful bust of Nefertiti at "Neues Museum", which for an Egyptian, always triggers the question, "How did that get here?" – unfortunately, without receiving convincing explanations. Nefertiti can be said to have migrated to Germany many years ago and is now fully integrated as the most beautiful "Berliner." Meanwhile, newly migrated, highly skilled Egyptians settling in Berlin are still searching for new life prospects.

These activities laid the foundations for bridging knowledge between the two countries (Schneider & Raulwing 2012). The 19th century also saw the start of mobility in the other direction. A famous example is the Arabic-language documentation

of the travels of Hassan Tawfiq Al-Adl[1] to Berlin as a scholar sent to the University in Berlin to teach Arabic (Arab 2008). Tawfiq's journey is described in great detail: how he reached Berlin, including the details of his travels, what the streets of Berlin looked like, how the people of Berlin treated him, what amused him about the local hospitality, and how impressed he was with German culture. He wrote a masterpiece that can serve as a roadmap for integration and understanding others to reach a common ground for cooperation and innovation.

Additionally, he spent much time describing how to fit the insights he had won into Egyptian society, always summarizing "take home" messages (Arab 2008). Unfortunately, Tawfiq died young, and his work did not become as popular as the works of his colleagues. Having discovered this diary accidentally at the annual Cairo book fair in 2019, I can attest that a German translation of this book is warranted.

Jumping again to recent history, we find a progression in the bilateral academic cooperation in education which is, in many instances, supported by the German Academic Exchange Service (DAAD). Funded mainly by the German Federal Foreign Office, with a settled establishment in Zamalek in Cairo, the DAAD office has offered numerous opportunities for Egyptian academics to travel to study in the German higher education landscape. One example: the German Egyptian Research Long-term Scholarships (GERLS) supported many Egyptian medical and paramedical researchers until 2013, helping them to get part of their academic and professional training in Germany. These scholars are afterward included in the DAAD Alumni Society in Egypt, representing one of the most prestigious networks for both countries.

Egyptian and German medical education: Different yet similar?

Analyzing the main highlights of medical education in Germany and Egypt helps us understand the cooperation initiatives that would be intensive and fruitful. In Germany, medical education is offered mainly in public universities, with a few private universities conducting similar programs. Nearly 80,000 students are enrolled in faculties of medicine, where about 10,000 students start medical education every year and 6,000 graduate annually. The learning and evaluation process takes six years (two years of preclinical, four years of clinical studies) before the students graduate after the successful completion of the board exams, the *Staatsexamen* (Zavlin et al., 2017).

Both countries have structural similarities: The undergraduate medical education in Egypt does not differ in the amount of required study time from that in Ger-

1 Editors' note: See Chapter 20 by Islam Dayeh. The chapter documents the scholarly contributions by Hassan Tawfiq Al-Adl at the Seminar für Orientalische Sprachen 1887–1892.

many. Most medical faculties are public medical schools, with only a few private institutes. Nearly 10,000 students graduate annually (Abdelaziz et al., 2018). The young graduates then choose their specialty and begin a residency program which includes their postgraduate studies. In Egypt, the opportunity to enroll in a competent residency program with a properly organized training program is limited to university hospitals and only selected educational institutes. It is not easy to get into residency programs. Given limited resources and financial obstacles, many graduates look for places in residency programs abroad. (Schumann et al., 2019). There is an ongoing and fierce discussion on how to upgrade the healthcare system in Egypt: not only to stop the profound loss of young doctors, the most important resource to build the system but also to improve the quality of health services offered to Egyptian patients. The World Health Organization (WHO) announced a global shortage of 7.2 million healthcare providers in 2013. This shortage is expected to reach 15 million by 2030 (Liu et al., 2017).

Although thousands of Egyptian medical students graduate annually, Egypt reports a shortage of physicians in certain areas. Between 2019 and 2020, 11,500 Egyptian medical graduates left the Egyptian health sector for the United Kingdom (Mahfouz, 2023). In 2016, the density of physicians stood at one physician for every 12,285 inhabitants. Physicians congregate in Cairo and surrounding areas or move abroad, intensifying physician shortages in other areas of Egypt. New recruitment cannot replace this loss. Although it supplies the world with significant numbers of immigrant medical graduates, physician migration follows highly random, nearly untraceable patterns. (Kabbash 2021).

In Germany, postgraduate medical education has a well-established system that offers places for young residents to work, earn money, and complete their clinical training and postgraduate studies. As in Egypt, there is a growing shortage of medical professionals and physicians in Germany, which increases the demand for more students to study medicine and enroll in the healthcare system to serve patients. Thinking about the needs of each side would help grow the potential to build a steady, durable healthcare convention between the two countries to fulfill mutual demands.

During the last decade, and especially after the Arab uprisings and the instabilities experienced in Egypt, the immigration of healthcare professionals to Germany played a significant role in Egyptian-German medical collaboration. On the upside, several medical and surgical professionals started a career in Germany with high achievements in several clinical and research engagements. Their mobility adds visibility in the international literature, where we can find several Egyptian medical professionals involved in highly cited paramount studies (Mueller et al.; Pfaff et al.; Schiering et al.; West et al.) On the other hand, the migration of Egyptian doctors to Europe harms the healthcare system in the country of origin. In a recently published survey, the lack of resources, weak infrastructure, and financial stress were the most

common motives for immigration from Egypt to Western countries (Schumann et al., 2019). In another recent study, the ineffective communication among physicians, between physicians and patients, and between physicians and nurse staff was a push factor for medical professionals (Kabbash 2021).

Therefore, the healthcare system in the home country urgently needs to implement a transformation project. This could induce Egyptian healthcare professionals to return and reintegrate into the Egyptian healthcare profession. In parallel, the integration of medical professionals from the Arab region, including Egypt, directly impacted the progression of medical tourism, as Arabic-speaking patients would mostly need clear communication about the procedures and the expected outcomes. There are substantial medical establishments, as in Berlin, with a long experience with medical tourism and evolving experience with Arabic medical professionals. However, the time taken for professional integration and the communication obstacles that might happen along the working career, as these with language problems, would slow down and sometimes stop the expected progression.

Therefore, initial collaborative efforts in medical education on the undergraduate level reaching the postgraduate training and research would be a well-defined objective to start with in order to find afterward the needed human resources for both communities in Egypt and Germany.

The neurosurgical collaboration between Egypt and Germany: from regional to the Capital

Berlin has long been an attractive destination for Egyptians wanting to study medicine and work as medical professionals. History remembers Dr. Mohamed Helmy, who moved to Berlin in 1922 to study medicine and continued living there with a memorable struggle to treat his patients, who included Jews, and an additional struggle against the racism towards him during the Nazi regime (Finkel 2017).

Berlin annually receives a vast number of immigrant medical professionals seeking language courses that qualify them to apply for jobs nationwide. Another group of Egyptian medical professionals enrolled in various academic and clinical jobs in Berlin.With its numerous clinics, including Charité, Berlin has absorbed numerous Egyptian doctors and has gradually integrated them into the German health sector.

In addition, the longstanding collaboration between Cairo and Greifswald Universities stands on solid ground. The neurosurgical collaboration started between Cairo University and Greifswald University with individual fellowships supported by the DAAD aiming for surgical training in neuroendoscopy. Appointing the first Egyptian fellow to Greifswald to work as a coordinator between both university hospitals was an unprecedented step. This unique activity provided new intercultural

experiences that put such coordinators in confrontation with the working conditions in both healthcare systems, which would offer tremendous experience that helps to make collaborations succeed. The collaboration started at the research and postgraduate education level and has now reached the point of teaching a bi-institutional curriculum for medical postgraduates in both countries (El Refaee et al., 2021). This innovative experience is an initiative to build a fully integrated undergraduate and postgraduate medical education program. Such a program would not only support an upgrade of the health service in Egypt but also represents an outstanding opportunity for exposure to expand the scope of accredited medical education needed for the maintenance and growth of the German healthcare system, which in turn creates significant brainstorming for improvement of the current education and training standards. No one can deny that Berlin played a role in the success story of this collaboration. From our experience, Berlin played a central role in preparing medical professionals before they started working in Greifswald, as they needed to learn the German language and integrate gradually in the German culture, and this happened in Berlin. In addition, the strong ties between the departments of Neurosurgery in Berlin and Greifswald led to the joining of neurosurgical academics from Charité to the committee of lecturers of the Cairo-Greifswald collaboration. Critical concepts for future development are more technology integration, intensified practical teaching, and obligatory knowledge exchange through meetings abroad or training. In the future, strong ties between the German University in Cairo and University Greifswald would give a strong potential to the GUC branch in Berlin to activate mutual training programs and be a central meeting point for a for promising collaboration that would strongly push both health care sectors towards the expected edge of excellence.

COVID pandemic and the transformation of medical education worldwide

The impact of the COVID-19 pandemic on the practice of medicine worldwide is expected to have long-lasting effects (McKee & Stuckler, 2020). Since the start of the COVID-19 pandemic, online educational activities have increased, both for previously established online courses and new online events. A large turnout encourages the widening of the scope of such activities. For example, the 2020 annual meeting of the American Association of Neurological Surgery was made available exclusively as an online event for the first time. The impact this will have on the future of medical and neurosurgical education is unclear (Rasouli et al., 2020; Dedeilia et al., 2020; Teton et al., 2020; Tomlinson et al., 2020; Planchard et al., 2020). Medical students and faculty alike have found online learning platforms enticing. Virtual platforms were extended to patient care and clinical teaching during the COVID-19 pandemic, when telemedicine played an increasing role, given the mobility restric-

tions enforced (Speidel et al., 2021; Gachabayov et al., 2021). The shift towards the increased incorporation of digital learning platforms encouraged the development of organized teaching modules on using such platforms in formal medical education to enable a systematic optimal usage of online medical curricula (Poncette et al., 2020). Virtual reality was integrated into medical curricula and used as a substitute for traditional cadaver labs in undergraduate anatomy classes. More advanced virtual reality modules were developed for neurosurgical resident training.(Nakai et al.; Roh et al.) These advances can undoubtedly enrich the learning experience when integrated into existing medical curricula and offer alternative teaching methods that might be of value in situations where face-to-face learning is impossible. However, online courses carry the disadvantages of distance learning and poor communication. Therefore, online learning platforms require evaluation, interaction, and communication tools for a better learning atmosphere.

On the other hand, a large part of medical education, especially surgical education, depends on acquiring technical skills best imparted through face-to-face interaction with hands-on experience in cadaver labs, on the wards, and in operating rooms. The use of technology to simulate such experience could be helpful at times where face to face learning is not possible such as during the pandemic, or for facilitating international exposure with a minimal financial burden; however, it would be erroneous to assume that traditional hands-on in medicine could be replaced by technology (Dohle et al., 2021).

In the Cairo Greifswald neurosurgical experience, a blended learning experience merged online and hands-on training. Online modules were enriched with interactive discussions, assignments, and two examinations after the first and the final module. For hands-on training, the candidates had to travel to Germany to get outstanding technical training after accomplishing the theoretical learning objectives in the online courses.

The German Egyptian cooperation, Cairo-Greifswald, which slowed with the start of the COVID-19 pandemic, the collaborative work has started to gain intense experience in the new trends needed in medical education, not only to overcome the mobility and long-distance restrictions but also to upgrade the curriculum and implement new teaching methodologies. The learning program was named "Fellowship of Neuroendoscopy" and organized between Greifswald and Cairo Universities. This fellowship has several modules that are coping with the new trends in education, such as the training-the-trainer module, which started and will be upgraded to increase engagement with the trainers before interacting with the trainees. The skills they acquire will lead to more efficient learning and reduce burnout scores during the learning program (Olm et al., 2021).

Future Prospects and Outlook

Using virtual reality to create atmospheres similar to surgical theatres and anatomical laboratories is one of the current innovative projects. Widening the collaboration to reach newly developed upgradable curricula for the undergraduate and postgraduate medical studies that are accredited by both countries, together with improving the health information system in Egypt all these together might serve for the inauguration of a collaborative Egyptian-German Health Foundation that offers balanced medical education, young medical professionals that are capable of doing their duties in any of the two countries, and an efficient healthcare system on both sides. With the global rise of interest in health care and the rising need for more medical and paramedical personnel, such an initiative can be a substantial move to encounter great demand soon. In the medical world, Charité is the largest university hospital in Europe, and Kasr Al-Ainy is the largest in the Middle East. Creating a medical collaboration between both university hospitals would strengthen the cooperation between the two capitals. One example of potential cooperation in the medical profession is a possible Berlin-Cairo collaboration to treat Hydrocephalus (water in the brain): Cairo University Children's Hospital currently accepts more than 1,000 children annually suffering from that disease. In Berlin, Charité endorses a well-established pediatric neurosurgery unit concerned with the same disease. It secures a binational fund to support an international medical program towards better management and treatment by bringing together two top medical university hospitals, Charité in Berlin and Kasr Al-Ainy in Cairo. That dream guarantees to reach better worldwide guidelines to offer healthier futures for these children across Arab-German borders.

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