Empowering Healthcare Professionals to Achieve Health Equity: The Need for Education on the Right to Health in Sudan and Egypt

Abstract

This thesis research focuses on the implementation of the Right to Health within the medical school curricula in the Sudanese and Egyptian systems and how it may help address the issues of inequality and poor health outcomes. Based on the Health Equity Framework, the study aims to determine how the inclusion of this right affects the educational processes concerning power dynamics, relationships and connections, personal attributes, and physiological processes. In places like Sudan and Egypt, there are system-related hurdles that complement political instability as well as economic problems that make it difficult for adequate and effective health care to be provided. These are some of the problems that dictate the imperative need to address medical education reforms that seek to include health rights education. This research employs an approach of systematic literature review to assess the current state of Right to Health education in the selected countries through articles published between 2000 to 2024.

The study findings show that there is a significant lack of awareness and implementation of the Right to Health among the healthcare professionals in the medical curricula in Sudan and Egypt where the biomedical model prevails, and socioeconomic and environmental factors ultimately remain beyond the medical curriculum's purview. This research isolates several areas for practice improvement hitherto unnoted and underdeveloped within medical education, namely, interprofessional education, community-based participatory research, policy, and environmental health. Thus, the prospective educational changes are supposed to contribute to enhancing the awareness of the Right to Health among future doctors and other professionals in the sphere of healthcare science, and thereby equip them not only with medical skills but also the means necessary to support and enforce fair measures in the sphere of healthcare. In conclusion, this work has added to the global knowledge of health equity about the possibility of change through the enactment of human rights into the study and training of medicine, especially in settings characterized by socio-political dynamics.

Keywords**: Right to health, Health equity, Sudan, Egypt, Healthcare**

Contents

1 Introduction:

When everyone receives optimal healthcare without discrimination or prejudice, we can achieve the goal of health equity, leading to better mental and physical health for all. As a Medical intern in Sudan, where I received my medical education and training across various hospitals, I witnessed numerous severe violations of patients' rights to adequate health services. Many Sudanese patients struggled to receive essential services, including diagnosis, investigations, and treatments, with some even unable to see a doctor when critically ill. To address this gap, it is crucial to explore the underlying factors contributing to these disparities. One key issue is the understanding and implementation of the right to health among healthcare professionals, including doctors. The role of doctors is pivotal in advocating for and ensuring equitable healthcare access.

My understanding grew more profound, and I started to read about the Right to Health when I had the opportunity to collaborate with a local Dutch NGO called IFHHRO medical human rights network, dedicated to human rights through their project "Dignity at the Bedside," which focuses on promoting the concept of the Right to Health. My academic advisor at the Royal Tropical Institute (KIT) suggested that I write my global health master's thesis on a topic related to human rights and the Right to Health. Given my interest in this field and its close interlinkage with public health and promoting health equity in general, I agreed without hesitation.

This thesis aims to build upon the IFHHRO project by developing an E-education tool to help healthcare professionals understand and apply the right to health. Additionally, it will explore how the Right to Health and Health Equity reflect and influence each other. Through this endeavor, I hope to contribute to a more just and inclusive healthcare system, ensuring that the right to health is universally recognized.

To many, the highest attainable standard of physical and mental health is the most basic right of all. It includes entitlements as well as freedoms and has been enshrined in major international human rights instruments, notably Article 12 of the International Covenant on Economic, Social, and Cultural Rights (ICESR) (WHO, 2023). The right to health contains four essential interrelated elements: availability, accessibility, acceptability, and quality, also known as the AAAQ Framework (WHO, 2023).

The full realization of this right to health for millions of people across the globe, particularly those living in poverty, remains a far-fetched dream. However, good health is an important aspect of human well-being that goes hand in hand with other human rights.

In Sudan and Egypt, there exists a violation of this right, which brings about immense disparities in terms of health status and has a negative impact on general welfare (IJRL, 2020). The political instability and economic crisis have weakened their healthcare systems, resulting in a lack of infrastructure development or lack thereof, together with inadequate staffing levels (Elhadi et al., 2022). Moreover, Sudan's dictatorial regime privatized and decentralized health care delivery system, leading to poor quality services. For instance, private services have become too expensive for the majority of Sudanese citizens, more so for those who are impoverished (Fadul et al., 2021). This violates the right to health by limiting equitable access to vital medical services for all individuals, especially the most vulnerable groups. Similarly, in Egypt, some critics claim that it has limited access to healthcare services targeting a few groups, primarily affected communities or areas under political tensions (Aly et al., 2021). These restrictions create insurmountable barriers to accessing healthcare, making the majority of Egyptians opt-out of private service providers due to their inability to afford them.

Integrating the Right to Health into medical education is urgently required, given the influx of 250000 Sudanese refugees into Egypt, on top of the existing 5 million people, which has strained healthcare infrastructure (WHO, 2023a). These displaced individuals predominantly live in Aswan, Cairo, and Alexandria. This means that health professionals who are well-versed in health equity are urgently needed (WHO, 2023a). On June 30^{th,} 2023, almost 25,000 polio doses were given to children from Sudan, and over 20,000 MMRs were given at entry points. WHO delivered more than forty metric tons of medical supplies, including essential medications for non-communicable diseases (NCDs), and served up to 40,000 patients within three months (WHO, 2023a). As a result, WHO has also set up a clinic in Aswan and trained over two hundred clinicians to provide psychological first aid. Additionally, eight latrines were installed at entry points and two two-thousand-litre water tanks to enhance sanitation and access to clean water (WHO, 2023a). Gender-based violence response involved training eighty healthcare workers and advanced training for thirty-three

medical service providers in Aswan (WHO, 2023a). These efforts highlight the importance of integrating health-based approaches into every aspect of medical curricula to address disparities while promoting equality.

Paul Hunt, the UN Special Rapporteur on the right to the highest attainable standard of health (2002-2008), wrote in his report to the Human Rights Council that the right to health cannot be realized without the active support and engagement of many health professionals (Hunt et al., 2007). He stated their essential role: “Health professionals run the key international health organizations, as well as ministries of health across the globe. Naturally, they dominate the health sector, both public and private. There is no possibility of putting the right to health - and other health-related rights - into practice without large numbers of well-positioned health professionals understanding and supporting this endeavor.”

In this thesis, I will focus on the violations of right to health in Sudan and Egypt and justify why these countries are the primary focus of this study rather than exploring the issue in other nations. First, both Sudan and Egypt have long histories of political instability, conflict, and authoritarian rule, which have significantly impacted their governments' ability to fulfill their obligations to respect, protect, and meet the right to health (Massoud et al., 2011).

For instance, political and economic turmoil in Sudan has greatly affected the healthcare sector, which remains in a very bad state. This crisis has been worsened by the COVID-19 outbreak, where there were reports of hospitals being congested and or lacking critical medical commodities and equipment (IJRL, 2020). While Egyptian citizens continued to suffer from human rights abuses, one major violation is the Right to Health; another problem is that many, if not all, healthcare professionals in Egypt are unaware of this right (Muhammad and Ghazawy, 2018). Moreover, the healthcare system also has different issues, such as inaccessibility and complexity for the common population, while many cannot afford the required treatment (Pande and Hameed., 2017).

2 Problem Statement and Justification:

Healthcare professionals are front-line responders in the daily quest to fulfill the right to health (NTVG, 2024). They regularly face decisions about how to make quality health care

available, accessible, and acceptable to all people. In addition, they are often the first—if not the only—to witness violations of the right to health (NTVG, 2024).

Previous research has shown that health professionals seem to have inadequate knowledge about the right to health despite the international acknowledgment of the right to health. In his report to the Human Rights Council, Paul Hunt observed the following: “To be blunt, most health professionals whom the Special Rapporteur meets have not even heard of the right to health. If they have heard of it, they usually have no idea what it means, conceptually or operationally. If they have heard of it, they are likely to be worried that it is something that will get them into trouble.”

This does not imply that health professionals are oblivious to their role and responsibilities in safeguarding the well-being of their patients. Quite the contrary, they often intuitively understand their position and the importance of their duties.

Health professionals ensure individuals access quality healthcare services (Evashwick and Bax, 2013). However, there is a significant gap in their education regarding the right to health; medical schools’ education has frequently maintained a narrowly focused biomedical approach; this limited focus may insufficiently prepare future physicians to address the broader contexts shaping population health, including the right to health (EBSCOhost, n.d). This lack of knowledge can impede their capacity to advocate for and uphold this essential human right to access health services (Evashwick and Bax, 2013). Furthermore, healthcare professionals occasionally find themselves in the unique circumstance of being the main, if not the only, witnesses to violations of the right to health (NTVG, 2024).

Health disparities and violations of the Right to Health remain persistent in many parts of the world, particularly in conflict-affected and fragile regions (Ramadan and Brieger, 2022). The experiences of Sudan and Egypt, two neighboring countries in North Africa, exemplify the challenges in ensuring the right to health for all.

These health disparities have been further worsened by the COVID-19 pandemic in both countries, whereby essential services have been disrupted and have affected the poor and marginalized people (Plianbangchang et al., 2018). This thesis looks at the right to health it is not part of medical curricula or tasks of healthcare professionals, healthcare access and

policy implementation in Sudan and Egypt, where there are marked differences. Major challenges affecting healthcare delivery include political instabilities and economic challenges in Sudan, especially in rural settings (Ismail et al., 2020). In Egypt, there is a significant difference in the availability of health care between the urban and rural populations, especially the marginalized population, whereby they struggle to access health care, and in the event that they can, they cannot afford it (Abdel Rehman and Abonazel, 2021). The existing medical education largely encompasses biomedical orientation with little or no input on human rights and health equity. This puts healthcare professionals in a position of weakness when it comes to demanding and ensuring compliance with the right to health.

3 Objectives and Study Questions:

This research aims to investigate the integration of the Right to Health into the medical schools' curricula and training in Sudan and Egypt, using the four elements of the Health Equity Framework (HEF) (Peterson and Coyle., 2021). And how this can affect health outcomes and achieve health equity.

3.1 Main study question:

"To what extent is the Right to Health included in the formal education and training of healthcare professionals in Egypt and Sudan?"

3.2 Sub-questions relevant to 4 spheres of HEF:

3.2.1 Systems of Power:

Systems of power influence health disparities and outcomes in the form of institutional, political, and social structures. These include laws, policies, and practices that govern resource distribution, healthcare access, and the overall functioning of health systems. Understanding systems of power involves recognizing how historical and contemporary power dynamics impact health equity. Systems of power shape health disparities by influencing the distribution of resources and opportunities within society, ultimately affecting access to and quality of healthcare (Phelan and Tehranifar, 2010).

Main Sub-Question:

“How is the Right to Health concept integrated into the medical curricula in Sudan and Egypt?”

Systems of power influence health outcomes through institutional structures and policies. Examining how the right to health is integrated into curricula addresses whether healthcare professionals can navigate and challenge systemic inequities. Including human rights education in medical training enhances students' awareness and advocacy for health equity (Flood et al., 2017).

3.2.2 Relationships and Networks

Relationships and networks are the physical ties that bind individuals, communities, or organizations and affect health outcomes. They include such things as social support systems, professional collaborations, and community partnerships needed to promote health and reduce disparities. Social networks and relationships can largely influence health behaviours and outcomes in terms of emotional support offered as well as resources and information that will better help in promoting equity in health (Berkman and Glass 2000).

Main Sub-Question:

“How do the medical curricula in Sudan and Egypt address the role of relationships and networks in achieving health equity and promoting the right to health?”

Relationships and networks promote collaborative and community-focused healthcare strategies. This sub-question examines if medical school prepares students to effectively exploit these links for addressing health inequity. Incorporating the significance of connections and networks in curricula would help improve collaborative healthcare among providers necessary for dealing with complicated health inequities (Satcher et al., 2010).

3.2.3 Individual Factors

"Individual factors" are unique characteristics or conditions of the people that determine the state of their health. These include genetic factors, the choice of lifestyle, social class, literacy levels, and various health practices. It is therefore important to acknowledge such aspects with the aim of providing quality as well as fair health care services. The social determinants of health include the individual factors that involve the socioeconomic status, health-related behaviours, and education levels of a population, which define their susceptibility to diseases and overall health (Marmot et al., 2005).

Main Sub-Question:

"To what extent do the medical curricula in Sudan and Egypt educate students about individual factors influencing health outcomes and the Right to Health?"

Gender, age, and ethnicity are major predictors of health. Evaluating curricula for content related to these factors is essential to guarantee that healthcare professionals can give individualized care that enhances health equity. It is crucial for promoting health equity to consider and respond to individual characteristics, which should be seen in line with the broad aim of achieving one's goal (Betancourt et al., 2005).

3.2.4 Physiological Pathways

"Physiological pathways" are the intermediate processes by which the social determinants of health are associated with health outcomes. This encompasses comprehending stress, environment, and nutrition effects on the body and how they cause health inequalities. Biochemical mechanisms are the routes through which social factors influence health, such as the manner in which chronic stress results in cardiovascular disease.

Main Sub-Question:

"How do the medical curricula in Sudan and Egypt incorporate the understanding of physiological pathways concerning the Right to Health and health equity?"

Knowledge of physiological pathways enables one to identify how social determinants present themselves at the physiological level. Applying this knowledge to medical training helps build up interventions for health inequities. The incorporation of physiological pathways in the medical curricula enables healthcare professionals to correlate social and environmental determinants of health with biological health outcomes, promoting health equity (Alder and Stewart, 2010).

4 Methodology:

Among healthcare professionals and medical students, this study will review the literature to comprehend more about the understanding and education of the Right to Health. The Right to Health was investigated through a literature review, which determined how much medical school curricula and training programs in Sudan and Egypt include it. Using this method, an all-inclusive picture of health equity in these countries is expected to be drawn based on the present level of knowledge with regard to the issue of the Right to Health education.

4.1 Literature review:

4.1.1 Research Design:

This investigation implements a systematic literature review methodology. To address the research questions and objectives, the systematic review approach enables the exhaustive collection, analysis, and synthesis of existing research. This approach guarantees the comprehensive examination of the extant body of knowledge regarding integrating the Right to Health into medical education in Sudan and Egypt.

4.1.2 Inclusion criteria

peer-reviewed articles and reports published in English within the last 24 years (2000-2024) from the year of publishing General Comment No. 14. Articles focusing on the Right to Health, health equity, and related educational programs will be included. Articles excluded from health professionals' health equity roles were irrelevant to these objectives.

4.1.3 Data Collection Methods

4.1.3.1 Literature Search:

Databases: The literature search used PubMed, Google Scholar, and the Vrije Universiteit online library and other scientific databases

Keywords: 'Right to Health,' 'Health Equity,' 'Medical Education,' 'Integration of Curricula,' 'Healthcare Training,' 'Sudan,' 'Egypt,' 'Health Systems,' 'Social Networks in Health,' 'Socioeconomic Status,' 'Health Promotion and Disease Prevention' and 'Environmental Health' were used. Health Promotion, and Health Behaviour and Environmental Health."

Inclusion Criteria: A study could be included in the analysis if the author described bringing the Right to Health into medical education, investigated at least one of the four elements of the Health Equity Framework (HEF), and published it from 2000 to 2024. This analysis includes peer-reviewed articles and reports published in English within the last 24 years.

Exclusion Criteria: In this process, only peer-reviewed sources were considered, and the rest were excluded if they did not relate to the research questions or were published outside the given period.

4.1.4 Data Extraction and Synthesis

4.1.4.1 Screening Process:

1,053 studies were identified during the initial search. The relevance of these studies to the research questions and inclusion criteria was evaluated by examining their titles and abstracts**. 67** publications were chosen for full-text review following the initial screening.

4.1.4.2 Full-Text Review:

The selected studies were thoroughly examined during the full-text review to ascertain their quality and relevance. This process identified **31** studies most pertinent to the research objectives and questions.

4.1.4.3 Summary table of 31 relevant studies for this research work

Authors	Year	Objectives	Findings
Adler, N. E., Stewart, J., Cohen, S., et al.	2008	Explore socioeconomic status and health in the US.	Socioeconomic status significantly affects health outcomes.
Balazs, C. L., & Morello-Frosch, R.	2013	Examine how community-based participatory research strengthens science's rigor, relevance, and reach.	CBPR enhances scientific rigor, relevance, and community engagement.
Bambra, C., Riordan, R., Ford, J., & Matthews, F.	2020	Analyze the impact of the COVID-19 pandemic on health inequalities.	COVID-19 exacerbates existing health inequalities.
Barry, M. J., and Edgman-Levitan, S.	2012	Discuss the importance of shared decision-making in patient-centered care.	Shared decision-making is crucial for effective patient-centered care.
Bensing, J.	2000	Bridge the gap between evidence-based medicine and patient-centered medicine.	Integration of both approaches improves healthcare outcomes.
Reddy et al.	2013	Define and measure the social accountability of medical schools.	Social accountability metrics can guide medical education improvements.
Brulle, R. J., and Pellow, D. N.	2006	Investigate the relationship between environmental justice and health inequalities.	Environmental inequalities contribute to health disparities.
Butterfoss, F. D.	2007	Explore the role of coalitions and partnerships in community health.	Effective partnerships enhance community health initiatives.
Gouin et al.	2011	Examine the effects of chronic stress on immune dysregulation and health.	Chronic stress leads to immune dysregulation and adverse health outcomes.
Epstein, R. M., & Street, R. L.	2011	Explore the values of patient-centered care.	Patient-centered care improves health outcomes and patient satisfaction.
Frenk, J., Chen, L., Bhutta, Z. A., et al.	2010	Transform education to strengthen health systems globally.	Reformed health education is essential for more robust health systems.
Meier and Gostin, L. O.	2020	Discuss global health law.	Global health laws are crucial for international health governance.
Landrigan, P. J., Fuller, R., Acosta, N. J., et al.	2018	Investigate the impact of pollution on health.	Pollution significantly impacts public health globally.
Link, B. G., and Phelan, J.	2001	Conceptualize stigma and its impact on health.	Stigma contributes to adverse health outcomes and social inequalities.
Lustria, M. L. A., Noar, S. M., Cortese, J., et al.	2013	Conduct a meta-analysis of web-delivered tailored health behavior change interventions.	Web-based interventions are effective for health behavior change.
Marmot, M.	2020	Review health equity in England 10 years on from the Marmot Review.	Health inequities persist and have worsened in some areas.
Marmot, M., and Wilkinson, R. G.	2005	Investigate the social determinants of health.	Social determinants play a significant role in health disparities.
McEwen, B. S.	2013	Integrate brain, body, and behavior approaches to stress.	Stress affects both physical and mental health.
McEwen, B. S., & Gianaros, P. J.	2010	Explore the role of the brain in stress and adaptation.	Brain function is central to stress response and health outcomes.
Wallerstein, N., and Duran, B.	2010	Guide on community-based participatory research for health.	CBPR is effective for health research and community engagement.

Navarro, V.	2009	Discuss social determinants of health.	Social determinants are crucial to understanding health disparities.
Dearry, A.	2002	Use CBPR to advance environmental health sciences.	CBPR advances environmental health by involving communities.
Drobac P, and Morse M.	2016	Examine global health equity and human rights education in medical training.	Human rights education is crucial for health equity in medical training.
Peters, D. H., Garg, A., Bloom, G., et al.	2008	Explore poverty and access to healthcare in developing countries.	Poverty significantly restricts access to healthcare.
Prochaska, J. O., Redding, C. A., and Evers, K. E.	2015	Discuss the transtheoretical model and stages of change in health behavior.	The model is adequate for understanding and promoting health behavior change.
Ruger, J. P., and Yach, D. (2014)	2014	Analyze global health governance and the role of the WHO.	WHO plays a critical role in global health governance but faces challenges.
Roussos, S. T., and Fawcett, S. B.	2000	Review collaborative partnerships for community health improvement.	Collaborative partnerships are effective for community health improvement.
Sallis, J. F., Owen, N., and Fisher, E. B.	2008	Discuss ecological models of health behavior.	Ecological models provide a comprehensive framework for health behavior research.
Sapolsky, R. M.	2004	Explain stress, stress-related diseases, and coping mechanisms.	Chronic stress is linked to numerous diseases, but effective coping can mitigate these effects.
Zhang et al.,	2018	Study the impact of air pollution on cognitive decline in older adults.	Air pollution contributes to cognitive decline in older adults.
Sen, A.	2005	Discuss human rights and capabilities.	Enhancing capabilities is essential for realizing human rights.
Steptoe, A., and Kivimäki, M.	2012	Explore the relationship between stress and cardiovascular disease.	Chronic stress increases the risk of cardiovascular disease.
Bach et al.	2007	Discuss globalization and its impact on health.	Globalization has complex effects on health, including both positive and negative impacts.

4.1.4.4 Data Extraction:

Information from the chosen articles was collected using the same form, which contained data on study details, methods, results, and applicability to the research questions. The collected data were then categorized into themes according to the four components of the Health Equity framework.

4.1.4.5 Data Synthesis:

The extracted data were then analyzed and incorporated to develop a big picture of the implementation of the Right to Health in the medical curricula of Sudan and Egypt. The synthesis process included identifying patterns and themes that were complemented by the

gaps in the literature; in this case, the results were grouped under the four elements of the Health Equity framework.

4.1.5 Ethical Considerations

Since this study is a literature review, it does not directly involve subjects impacted by the issues under consideration, and therefore, it did not require ethical clearance

4.1.6 Limitations

This study has limitations, including the possibility of publication bias, which entails the tendency to publish positive results. Further, using previous literature reduces the chance of observing new trends that have not been published in scholarly articles. These limitations were overcome by employing several databases and strict search terms to identify as many studies as possible.

4.2 The Analytical Framework:

The analytical framework used in the analysis for this research will be the Health Equity Framework (HEF) developed by ETR Advancing Health Equity organization. The framework comprises three foundational concepts: Equity at the Core of Health Outcomes, four Multiple Interacting Spheres of Influence, and Historical and Life-Course Perspective. (figure 1) (Creswell et al., 2014; Peterson and Coyle., 2021; Salako et al., 2023). The concept of the Right to Health and the definition of health equity according to the Health Equity Framework both emphasize that everyone has the right to enjoy optimal healthcare.

I used the four elements of the Health Equity Framework to examine whether systems of power, relationships and networks, individual factors, and physiological pathways are addressed in the medical curricula in Sudan and Egypt. Yet the health equity framework can advance our understanding of what already exists in formal education in Sudan and Egypt. Investigating the four spheres of the HEF may help illuminate how medical schools' curricula in Sudan and Egypt and relevant stakeholders' biases can reinforce social inequities, contribute to health disparities, and affect the realization of the right to health (Salako et al., 2023).

The right to health is a fundamental human right that includes access to timely, acceptable, and affordable healthcare of appropriate quality. The ETR framework's four pillars provide a structured method for examining how well this right is understood, taught, and implemented in formal education and training in Sudan and Egypt.

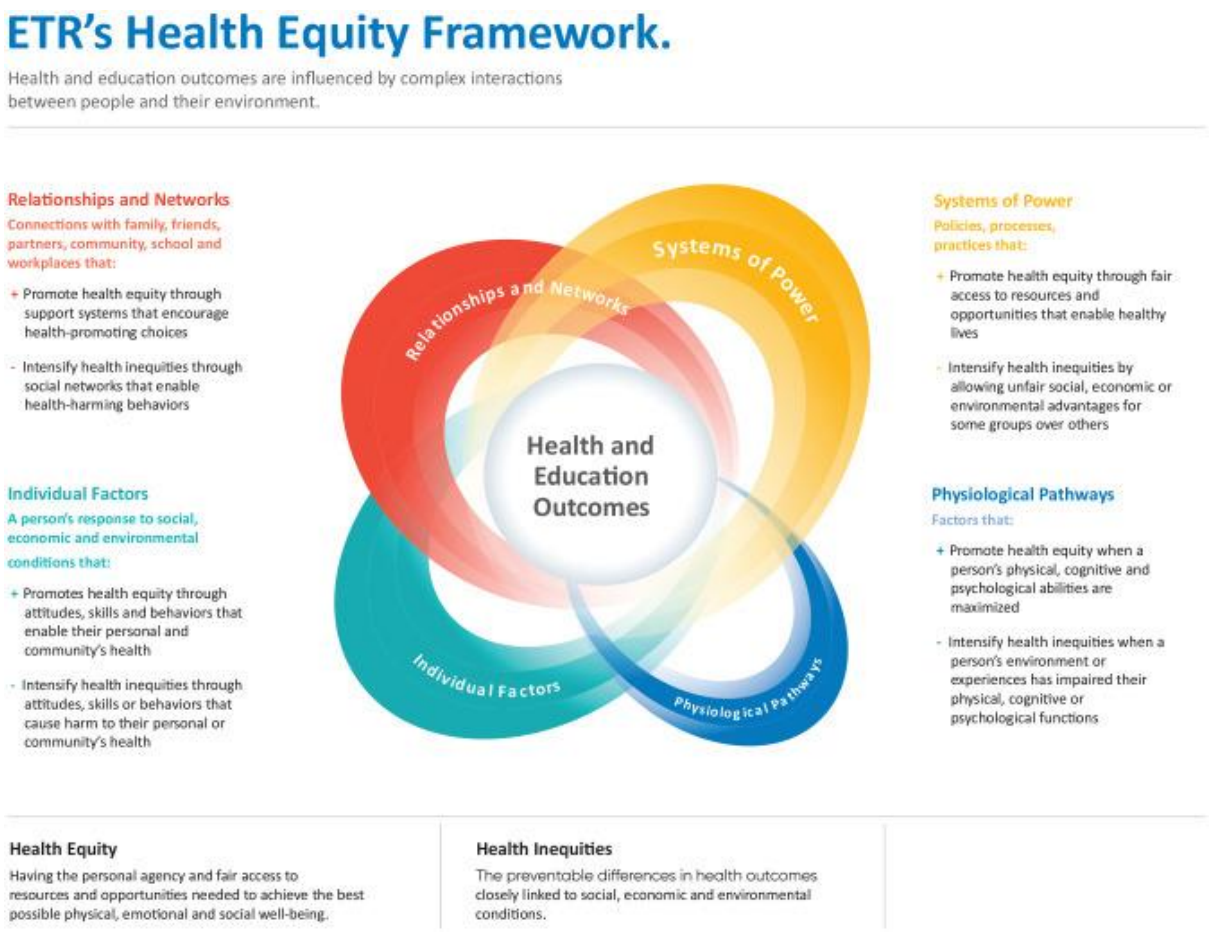

Figure 1: ETR's Health Equity Framework

Element	Description
Systems of power	Systems of power refer to policies, processes, and practices that determine the distribution and access to resources and opportunities needed to be healthy. These systems contribute to group systematic and differential treatment, including institutionalized and interpersonal bias (Peterson and Coyle., 2021). this pillar will asses how medical students and medical school students address systemic biases and institutional barriers to health equity.
Relationships and Networks	Relationships and networks include many connections and support structures for family, friends, etc. These connections may simultaneously serve as protective influences from health-harming behaviors and sources contributing to stigma, discrimination, or pressure, leading to poorer health outcomes (Peterson and Coyle., 2021). Evaluating this element reveals how well healthcare professionals and medical students understand the impact of social relationships on health-seeking behaviors and outcomes.
Individual factors	Individual factors concern a person's response to social, economic, and environmental conditions through behaviors. These factors include childhood development of social and emotional skills, associated with better mental and physical health outcomes, life satisfaction, and life expectancy in adulthood (Peterson and Coyle., 2021). This pillar investigates how medical education and training educate healthcare professional students to be aware enough that a person's attitude and skills can influence their healthcare-seeking behavior.
Physiological pathways	physiological pathways refer to a person's biological, physical, cognitive, and psychological abilities. These factors contribute substantially to health outcomes and concern how the timing and intensity of other determinants might change developmental, biological, and cognitive trajectories that lead to poorer health outcomes. For example, early childhood adversities disrupt the development of brain architecture and function (Peterson and Coyle., 2021). This pillar investigates whether medical students' and healthcare professionals' awareness of a patient's biological state can influence their health-seeking behavior or limit access to healthcare services.

Table 1: The research briefly describes and uses ETR's health equity framework's four elements.

5 Study findings and results (Literature Review)

This literature review will therefore seek to explore the implementation of the Right to Health within the teaching and training of medical schools in Sudan and Egypt, as well as the

effects of the implementation on achieving health results and eradicating health inequalities. The review is guided by the Health Equity framework's four elements: the systems of power, relationships and networks, individual factors, and the body's physiology. A systematic PUBMED and GOOGLE SCHOLAR search was performed to review these components in detail.

There were 1,053 studies identified in this search, out of which they were related to the defined keywords. Out of the 67 articles, I only included 31 papers in this analysis as these studies were most relevant to the research question and objectives within the context of the Health Equity framework.

The studies selected cover different areas that are important in examining the incorporation of the right to health in medical training. Some of these include the effects of a political and institutional framework on health inequality (Navarro, 2009; Bambra et al., 2020), the functions of social support and community collaboration for health equity (Gouin et al.,2011; Kawachi and Berkman, 2001; Roussos and Fawcett, 2000; Butterfoss, 2007); and individual factors (Wang et al., 2020). Also, recent research has identified the importance of considering physiological pathways, which include chronic stresses and environmental exposures, as they affect health (McEwen, 2020; Zhang et al., 2018). This review paper aims to provide a comprehensive understanding of how medical education in Sudan and Egypt could be improved to attain health equity through the adoption of the Right to Health by incorporating these divergent perspectives.

This study uses the Health Equity Framework (HEF), whereby each part explores sub-questions related to power systems, relationships, networks, individual factors, and physiological pathways. This approach guarantees a comprehensive analysis of health equity conditions and educational actions necessary to create change in Sudan and Egypt's healthcare professionals.

5.1 Thematic analysis under the HEF framework factors

5.1.1 Theme 1: Systems of Power

Power relations comprise organizational, political, and other social factors determining health inequities. Such systems include the legal frameworks, regulations, and measures that

regulate the distribution of resources, provision of health care, and overall operations of health systems. Understanding such systems is, therefore, essential so that the Right to Health can be incorporated into medical schools in Sudan and Egypt.

5.1.1.1 How is the Right to Health concept integrated into the medical curricula in Sudan and Egypt?

5.1.1.1.1 Main Concept of the Human Rights Integration into the Medical Education

Reddy and Lucan (2013) emphasize changing medical education to meet society's needs, human rights, and equity. They posit that medical schools should be socially responsible and capable of satisfying society's health needs. By integrating human rights education into medical schools, future doctors will be equipped to address health inequalities and endorse the Right to Health (Reddy and Lucan, 2013). Sen (2005) builds on this thought by explaining the role of capabilities and human rights in health policy instruction. He claims that such components enable healthcare professionals to fight the inequalities since they are incorporated. Following Sen's (2005) idea, medical education should teach medical expertise and develop the patient's concern for justice and human rights (Sen, 2005).

Drobac and Morse., (2016) define the current health inequalities worldwide and stress the importance of human rights education in medical schools. They state that such integration is critical to addressing inequalities and preparing healthcare workers to promote equity in the world. This research calls for human rights engagement in a curriculum promoting an equitable health system (Drobac and Morse., (2016).

5.1.1.1.2 Past and Present Relations of Power

That is why it is essential to consider the historical and present power relations within the framework of the Right to Health to include it in the curriculum for medical specialists.

Navarro (2009) has chosen an approach to identify the political and economic structures that have always been behind inequality in health. He argues that, for doctors who seek to eliminate health disparities at their root causes, it is important to know these structures. The same can be said about Navarro's (2009) work, which discusses a need for medical educators to critically analyze these relationships of power as they stand in preparation for activism and policy-making (Navarro, 2009).

The COVID-19 pandemic also demonstrates how social determinants shape people's health. Bambra et al.'s (2020) paper focuses on deepening health inequities during the pandemic and highlights why healthcare providers must be taught about this process. Their research reveals the necessity of understanding how social factors, economics, and politics influence public health development by creating appropriate programs and policies. Curricula can include these findings, which will help train future healthcare providers on how to cope with or fix disease gaps between different populations (Bambra et al., 2020).

5.1.1.1.3 Policies and Resource Distribution

Resources and policies are part and parcel of structures of power that influence health justice. Peters et al. (2008) define the effects of health system challenges on their ability to provide fair health care to the people. They have pointed out that policy-oriented education is required for future healthcare personnel to appreciate these constraints. In their study, Peters (2008) and his colleagues stress the role of health policy and management content in medical curricula so that students have the knowledge and skills required to champion and enact fairness in healthcare policies (Peters et al., 2008). Meier and Gostin (2020) also refer to legal factors pertaining to providing adequate and equal health care. He posits that GHL should be an essential component of the medical curriculum so that future healthcare workers have the legal perspective of health justice. This entails familiarity with the IHR, human rights legislation, and domestic legislation about health care provision and distribution (Meier and Gostin, 2020).

Ruger and Yach (2014) stress the policy and governance aspects of health equity. Hence, they call for incorporating policy and governance teaching into medical schools to equip health workers on the processes that influence health systems. The paper focuses on WHO in international health relations and the importance of linking medical training to worldwide health agendas to address health disparities squarely (Ruger and Yach., 2014).

Implementing the Right to Health in the medical curricula in Sudan and Egypt raises awareness of systems of power. This includes acknowledging the systems of institutions, politics, and societies that shape health and health inequalities. Reddy and Lucan (2013), as well as Sen (2005) and Drobac and Morse., (2016), call for integrating human rights education into medical curricula to meet society's requirements and respond to inequity.

Navarro (2009) and Bambara (2020) highlight that knowledge of the historical and modern sources of power or powerlessness that shape people's lives is critical in enabling healthcare professionals to prevent and reduce health inequalities. Also, as pointed out by Peters et al.(2008), Ruger and Yach (2014), and Meier and Gostin (2020) state that the distribution of resources indicates a need for policy-oriented education so that healthcare professionals can push for policy changes that will lead to a better distribution of resources. By incorporating the above elements in medical training, both Sudan and Egypt can improve the training of health personnel to embrace the Right to Health and reduce health disparities.

5.1.2 Theme 2: Relationships and Networks

Relationships and networks are defined as patterns of associations that can exist among people, societies, and organizations and affect health. Such relations involve social support networks, work associations, and community linkages, which are vital in enhancing health and eradicating gaps.

5.1.2.1 How do the medical curricula in Sudan and Egypt address the role of relationships and networks in achieving health equity and promoting the Right to Health?

5.1.2.1.1 Social Support Systems

Social support systems are essential in influencing health because they offer individuals the backing they need, either verbally or in writing, to counter adverse events, contain the impact of stress, or encourage adopting proactive health practices. Gouin et al. (2011) explain how social relations affect health and where social support should be incorporated into medical training. They explain that enhancing social capital can improve health outcomes by increasing the ability of people in the network to deal with stress and illness, hence reducing health differences. Educating medical students about the importance of social support systems can equip them with the knowledge to identify such networks to enhance patient care and community health.

Kawachi and Berkman (2001) also examine social integration and its relationship to health, stressing that it is necessary to explain the means of social support to healthcare workers. They argued that social relationships can affect psychological and well-being health indices. Appreciation of the function of social cohesion will enable healthcare providers to assist their patients and societies effectively. The components of medical curricula that should

cover the training on the significance of social networks and support can help healthcare providers learn about the value of strong communities to support the Right to Health and reduce health inequality.

5.1.2.1.2 Collaboration with Other Professionals and Development of Partnerships

Interdisciplinary and community integration is invaluable in solving multifaceted health problems and achieving health equality. Roussos and Fawcett (2000) discuss community coalitions and partnerships in health promotion, stressing the importance of collaboration skills in medical training. They posit that partnerships can also improve the efficiency of health interventions since several partners bring their resources, skills, and coordination to tackle health problems. The evaluation of teamwork and partnership among medical students can ensure that the students acquire skills to practice in teams and other community-based programs. Butterfoss (2007) briefs on community health coalitions, why they should be encouraged, and the associated difficulties in their implementation, especially in medical training programs. She further notes that through the use of community coalitions, the issue of health disparities can be rectified through the call for unity and organization of the communities. The core problem with coalitions is that they must be well-planned, require long-term dedication, and have competent leadership. Thus, by including topics related to the formation and development of community partnerships in medical curricula, educators will prepare future healthcare professionals to effectively promote health equity and the Right to Health through the formation and leadership of health coalitions.

5.1.2.1.3 Community-Based Participatory Research (CBPR)

Community-based participatory research is a collaborative model of research that is coined with the community's full participation in identifying research topics and conducting research. Wallerstein and Duran (2010) and Norman K. Wallerstein (2008) particularly stress that CBPR helps achieve health equity and should be included in the medical curriculum.

According to them, the involvement of the community and its knowledge makes CBPR an efficient approach to healthcare. By providing medical students with knowledge on CBPR, it becomes possible to develop their capacity for interacting with communities in research settings and thus improve mutual trust. In an article by Dearry et al. (2002), they outline how

CBPR can reduce environmental health disparities and how it needs to be integrated into health professions education. They point out that through engaging in CBPR, communities are able to cause changes in environmental health that will increase the chances of better health outcomes and reduced disparities. By incorporating CBPR within the medical curricula, lecturers would involve future professionals in guiding communities on what constitutes good health and resisting discrimination.

Balazs and Morello-Frosch (2013) also elaborate on this issue from a perspective of equity, insisting that it is particularly relevant to medical education today. To achieve this aim, they claim that CBPR ensures that scientific studies are improved at various levels, including quality, relevance, and accessibility, specifically for populations concerned by those studies. A good method would be preparing potential healthcare professionals via CBPR who could undertake such research in ways consistent with both medicine's demands as well as broader societal requirements towards marginalized populations promoting their Right to Health. Therefore, incorporating relationships and networks in medical curricula in Sudan and Egypt is crucial in achieving health equity and the Right to Health. According to Gouin et al. (2011) and Kawachi and Berkman (2001), positive social support positively impacts health and decreases health disparities. When explaining to medical students the importance of social networks, educators can teach them how to identify the networks and apply them to benefit patients and reduce health disparities.

Interprofessional relations and community engagement are also vital in resolving health inequalities. Swedish and Fawcett (2000) and Butterfoss (2007) note how effective partnerships and community coalitions can increase people's health status. Hence, inculcating lessons on collaboration and cooperation in medical curricula is essential for educators to prepare healthcare professionals to work efficiently in teams and other community contexts.

CBPR is a valuable approach to reducing health inequalities. Wallerstein and Duran (2010), Dearry et al. (2002), and Balazs & Morello-Frosch (2013) stress the use of CBPR, especially in improving health equity, and encourage it as a part of the medical curriculum. Educators can introduce CBPR to medical students to ensure that they know how to approach any

community and work effectively with them. Therefore, incorporating these elements into medical training programs in Sudan and Egypt can help train health professionals to support health equity and the Right to Health. Relationships and networks and their proper management are significant in ensuring equity and effectiveness of health care.

5.1.3 Theme 3: Individual Factors

Individual factors refer to personal characteristics and conditions that determine one's health status, including genetics, lifestyle, income, education, and health risk factors. Understanding and considering these factors is vital in providing patient-centered and fair health care.

5.1.3.1 To what extent do the medical curricula in Sudan and Egypt educate students about individual factors influencing health outcomes and the Right to Health?

5.1.3.1.1 Socioeconomic Status and Education (SES)

The concept of SES is the foundation of health disparities and defines the availability of resources, healthcare, and opportunities to achieve healthy lifestyles. Link and Phelan (2001) describe the primary explanations for those differences and how SES influences people's vulnerability to risk factors and their ability to benefit from preventive and therapeutic health care. They state that medical education cannot ignore the issue of SES determinants of health inequalities if future doctors are to reduce these disparities. Thus, it guarantees that the healthcare providers understand the social aspects of patients' lives and adjust the treatments. Adler et al. (2008) present the effect of SES on health and emphasize the need to introduce this information into the curricula of medical schools. They support training that exposes medical students to the relationship between social determinants of health and disease and, thus, enables them to handle such factors when practicing. Knowledge of the factors that influence the health of populations prepares future healthcare providers to support health equity in policy and practice.

Marmot and Wilkinson (2020) also emphasize the relevance of social determinants in medical school curricula to eliminate disparities. His work stresses that despite theoretical growth in medical education regarding social determinants of health, gaps in parity call for further concentration on these issues in medical education. It is recommended that SES should be incorporated into the medical school curricula in Sudan and Egypt to enhance

students' understanding of health equity and equip them with adequate skills to address SES-related health disparities.

5.1.3.1.2 Health Behaviors

Lifestyle factors such as what people eat, how they move, whether they smoke, and how much they drink directly impact health. More detailed information on the involvement of health behaviors in chronic disease prevention can be found in Sallis et al. (2008), and the authors stress that such issues should be included in the curricula for medical students. Some of the criticisms leveled at the promoters of this approach state that comprehending the ecological models of health behavior, which encompasses the enhancement of the individual, social, and physical environment, is critical for health promotion. Introducing these models to medical students will assist them in formulating and applying treatment measures that can foster health among their clients.

Prochaska et al. (2015) outlined the transtheoretical model of behavior change as having a place in health promotion and should be included in the training of healthcare professionals. The model describes processes of change that people go through when altering their behavior, which enables healthcare workers to assist patients in changing their habits for the better. This model is quite helpful to be incorporated into medical education so that the students can identify the patients' preparedness for change and thus modify their change interventions for better health promotion.

According to Lustria et al. (2013), behavior change through digital health interventions is crucial and applicable to today's medicine. They note that web-administered targeted health behavior change interventions can successfully provide population access. Including training on digital health tools as part of the curricula in medical schools can equip future healthcare workers with the capacity to use technology to support health behaviors, hence enhancing the delivery of health education to the larger population.

5.1.3.1.3 Personalized Healthcare

Personalized care relates to providing healthcare care specific to the patient's characteristics. In the same article, Bensing (2000) highlights patient-centered care as a way of enhancing health inequalities and calls for training healthcare practitioners. She contends

that the only way to manage patients' needs and expectations is to close the gap between evidence-based medicine (EBM) and patient-centered medicine (PCM). It can be argued that educating medical students on patient-centered communication is effective for building therapeutic rapport, enhancing patients' satisfaction, and producing optimal health outcomes.

Epstein and Street (2011) discuss the effects of patient-centered communication on patients' health outcomes, stressing the concept's relevance in the context of medical training. According to the authors, communication is one of the critical components of patient-centered care since it enhances information sharing and mutual understanding between the patient and the healthcare provider. Including communication skills in medical curricula enables students to acquire the skills needed to better engage their patients in quality dialogue, improving their relationship.

Barry and Edgman-Levitan (2012) explain the concept of shared decision-making in health care as a tool that can improve patient-centered care; they also call for its integration into medical education. Partnership based on clinical decisions occurs when the clinician and patient decide about the treatments and care plans based on scientific evidence and the patient's preference. When the principles and practices of shared decision-making are incorporated into the curriculum of medical schools, future healthcare professionals will be ready to involve patients in their treatment processes effectively, thus enhancing the quality and outcome of treatment and patients' satisfaction.

Including individual factors in medical curricula in Sudan and Egypt helps to enhance health equity and the Right to Health. Link and Phelan (2001), Adler et al. (2008), and Marmot (2020) also focus on such concerns as socioeconomic status and education in medical training. Thus, exploring the relationship between socioeconomic status and health will ensure that future healthcare professionals can design better approaches to eliminating the health differential (Bach et al., 2007).

Health behaviors are another determinant of individual characteristics that define a person's health status. According to Sallis et al. (2008), Prochaska et al. (2015), and Lustria et al. (2013), there is a lack of preparedness in Medical Education on the training of models of health behavior change and digital health intervention. This knowledge prepares medical

students to help patients make better lifestyle choices, translating to enhanced health status. Individualized care is crucial in managing the patients due to the diverse nature of patients' needs. Authors such as Bensing (2000), Epstein and Street (2011), and Barry and Edgman-Levitan (2012) stress patient-centered communication and shared decision-making in medical education. Understanding these principles allows medical schools to equip upcoming physicians, nurses, and other healthcare workers to deliver care that addresses and is aligned with patient's preferences, concerns, and beliefs. When adopted and incorporated into the medical curricula of Sudan and Egypt, these elements will enhance the preparation of healthcare professionals to promote the Right to Health and health equity. Exploring individual factors is essential for effective and fair healthcare intervention and increased health span among various groups of people.

5.1.4 Theme 4: Physiological Pathways

Physiological pathways are the biological mechanisms by which social determinants of health influence individual health outcomes. This encompasses comprehending how stress, environmental exposures, and nutrition affect bodily functions and contribute to health disparities.

5.1.4.1 How do the medical curricula in Sudan and Egypt incorporate the understanding of physiological pathways about the Right to Health and health equity?

5.1.4.1.1 Biological Mechanisms

Marmot and Wilkinson (2005) state how the social determinants of health work on biological systems and, therefore, stress that such mechanisms should be known to healthcare workers. They point out that poverty level disparities, stress, and environmental factors directly affect biological processes and, therefore, health. For example, stress that is prolonged can lead to a sequence of biological changes that are likely to lead to many diseases and conditions, such as heart disease and mental disorders. Including this knowledge in the curricula preparing future healthcare providers will help the latter improve their understanding of social determinants as the factors influencing health and illness, which, in turn, will allow for eradicating health inequalities (Marmot and Wilkinson, 2005).

Sapolsky (2004) describes the impact of stress on health and stresses the necessity of introducing this concept into medical curricula. He elaborates that long-term stress means

that the body's stress response system remains active, which causes the body to undergo adverse physiological changes such as increased blood pressure, weakened immune system, and increased levels of inflammation. It is instrumental for medical students to fully comprehend these biological pathways, as it makes them acknowledge the severe consequences of stress and work on preventing them. Integrating stress biology into the medical curriculum benefits future physicians by helping them grasp the big picture of their patient's health and realize the significance of stress as a factor that should be considered for disease prevention and treatment (Sapolsky, 2004).

McEwen (2013) looks deeper at how stress affects health and why these biological pathways must be taught to medical students. He coined allostatic load, which is described as the body's wear and tear resulting from chronic stress. The allostatic load has numerous adverse effects on an individual's health, such as hypertension, diabetes, and depression, among others. Explaining the concept of allostatic load to medical students and its impact on health helps the students evaluate and treat patients experiencing chronic stress effectively. An understanding of this is essential for the health equity agenda because people who grow up in conditions of deprivation are likely to experience high levels of chronic stress (McEwen, 2020).

5.1.4.1.2 Chronic stress and health disparities.

McEwen and Gianaros (2010) discuss the research on chronic stress and pathways in more detail to emphasize the need for teaching about these pathways among healthcare providers to reduce health disparities. They stress that persistent stress is one of the main links between SES and health; people with low SES are usually exposed to more stress because of their financial vulnerability, uncertain employment status, and social isolation. It is crucial to incorporate such knowledge regarding chronic stress and its effects on health into medical curricula so that educators can equip future healthcare providers with signs of chronic stress and its consequences for the targeted populations (McEwen and Gianaros, 2010). Stress and cardiovascular disease are described by Steptoe and Kivimäki (2012), and these authors supported the incorporation of the stress topic in health education. They describe how stress can lead to CVDs through the promotion of unhealthy lifestyles, including poor diet, no exercise, and smoking, among others, and direct effects such as high

BP and inflammation. These connections explain to medical students how to evaluate patients at risk and how to practice behaviors that will help control behavioral and physiological stress (Steptoe and Kivimäki, 2012).

Gouin et al. (2011) work, the authors discuss the impact of chronic stress on the immune system and argue that these findings should be included in the teaching of medicine. They observe that prolonged stress weakens the body's ability to fight infections and diseases, making it more vulnerable. This understanding is essential in the context of health equity, as groups that experience chronic stress due to social injustice will have more stress-induced immune dysfunctions. Incorporating knowledge about these mechanisms in medical students allows them to think through the stress of diagnosis and treatment of the patients, thus promoting efficiency and equality in the delivery of healthcare services Gouin et al. (2011).

5.1.4.1.3 Environmental exposures and health

In their article, Brulle and Pellow (2006) discuss how environmental injustice affects such population groups' health and stress the importance of raising awareness of these issues among healthcare workers. They posit that poor and minority groups are always at the receiving end of issues to do with environmental pollution, toxins, and other related problems like poor housing facilities resulting in poor health. When educational institutions incorporate ecological health into medical school curricula, they equip physicians, nurses, and other practice providers to identify how patients' health is affected by environmental conditions, to become involved in persuading policy-makers to eliminate ecological injustice and to ensure that all communities have better standards of living (Brulle and Pellow, 2006). Landrigan et al. (2018) talk about the disease burden resulting from environmental hazards, and they call for integrating ecological health into medical schools. They note that environmental threats, including air and water pollution, chemicals, and climate change, deliver a significant portion of the global health burden with the most considerable impacts on LMICs. Integrating this knowledge into medical training enables future healthcare providers to comprehend the broad spectrum of environmental factors that impact health. It allows them to advocate for and manage these issues in line with the principles of clinical medicine and public health (Landrigan et al., 2018).

Zhang et al., 2018 consider the impact of air pollution on cognitive deterioration and stress the importance of environmental health literacy in medical school. It is proven that long-term exposure to airborne pollution leads to a faster decline in cognition and higher dementia risk. This understanding is essential for medical students since it points to the need to take prophylactic measures and implement as many protective steps as possible to safeguard the susceptible groups of the population, including children and older people, from the adverse impact of pollution. This way, medical schools can contribute to developing future healthcare professionals who consider environmental factors as potential contributors to patients' health conditions (Zhang et al., 2018).

To promote health equity and the Right to Health, medical curricula in Sudan and Egypt need to incorporate physiological pathways only. When designing relevant intervention strategies, it is important to understand how Social Determinants of Health (SDoH) affect the health of an individual. The authors Marmot and Wilkinson (2005), Sapolsky (2004), and McEwen (2013) argue that doctors dealing with patients should be aware of the effects of stress and other social determinants on biological functioning within them. Integrating this knowledge into the preparatory process for medical schools allows healthcare providers to be trained to deal with health disparities.

In their works, such as those by McEwen and Gianaros (2010), Steptoe and Kivimäki (2011), as well as Gouin et al. (2011), they highlight that chronic stress is a major cause of inequality in health. By understanding what chronic stress causes and its connection between socioeconomic status or SES with regard to health outcomes, medical students are able to help better treat disadvantaged populations more comprehensively. This approach ensures that healthcare professionals identify the root causes of inequalities in health, thereby promoting health equity among patients. Another significant factor affecting health outcomes is exposure to environmental hazards. Research conducted by Brulle and Pellow (2006), Landrigan et al. (2018), and Zhang et al. (2018) study demonstrates the importance of ecological literacy during medical education. Future healthcare professionals can contribute towards improved living conditions for all communities by understanding the ill effects of environmental hazards on public health, hence supporting policies aimed at redressing eco-inequities.

6 Discussion

There has to be the inclusion of the Right to Health in medical curricula for Sudan as well as Egypt so as to enhance health fairness and outcomes. This process focused on power systems, connections, networks, human determinants, and physiological pathways in HEF.

Power systems shape health outcomes through institutional, political, and social institutions that distribute resources and healthcare. Political and economic turbulence in Sudan and Egypt worsen these disparities. Medical education needs to transform if the dynamics of power are to be understood. Reddy & Lucan (2013) suggest a curriculum change that would better align medical education with society's needs, including human rights and equity. There is significant relevance for this approach, given the high level of political volatility within the health sectors of both countries. Medical school teaching about human rights can help future doctors fight inequalities in healthcare by promoting rights-based approaches toward health while addressing systemic inequalities that affect marginalized communities.

Health policy education should focus on capabilities as well as human rights, according to Sen et al. (2005). These elements allow healthcare providers to identify and address health disparities. Social justice and human rights should be emphasized during medical education in Sudan and Egypt, where there are systematic inequalities. Through this method, healthcare professionals will effectively advocate for equitable distribution of healthcare services by implementing Right to Health policies, thereby significantly reducing inequities. During the COVID-19 pandemic, it became clear how social determinants impact people's health. Bambra et al. (2020) show how crises exacerbate them due to such factors as social, economic, or political circumstances that interfere with people's lives in different ways, leading to negative consequences concerning their well-being. That is why it is necessary for other subjects to be taught under medicine, such as general practice placements on inequality prevention, study group discussions around racism, etc., but mostly just all adding up into one comprehensive package called "multi-disciplinary learning." In order not only to understand but also eliminate those processes, it is necessary to acknowledge social determinants of health in medical curricula that will equip healthcare workers with the knowledge to address these disparities. Understanding these processes is important for

equity in health, but Sudan and Egypt are experiencing conflicts and economic instability, which put pressure on their health systems.

Relationships and networks influence health outcomes through social support, professional cooperation, and community partnerships. There is a need to include these factors in medical education to promote health equity. Social support networks should be included in medical training, as recommended by Gouin et al. (2011) since social ties impact health. Strong emotional, informational, and practical support from social networks helps individuals cope with stress and make healthy choices, thereby reducing inequities in health outcomes. Medical students use their social support environments to improve patient care and community well-being.

Medical educators should emphasize social cohesion's health benefits, according to Kawachi and Berkman (2001). Understanding how social ties affect health behaviors and mental health helps healthcare workers better serve patients and communities. Social networks and support systems training help future healthcare professionals build strong community relationships essential for health equity. Addressing complicated health challenges requires professional and community cooperation. Roussos and Fawcett (2000) recommend teaching collaborative skills in medical school since community coalitions promote health. Diverse stakeholders' resources and expertise improve health interventions in collaborative partnerships. Collaboration training enables medical students to work in interdisciplinary teams and communities, which is crucial in resource-poor countries like Sudan and Egypt.

Another health equity strategy is Community-Based Participatory Research (CBPR). Wallerstein and Duran (2010) recommend including CBPR in medical education to build community-based health interventions. CBPR incorporates community participants in research to ensure relevant and effective health treatments. Medical students learning about CBPR build community trust and collaboration, which helps reduce health inequities. Genetics, lifestyle, socioeconomic level, education, and health behaviors significantly affect health outcomes. Personalized and fair treatment requires recognizing and addressing these issues. Link and Phelan (2001) emphasize the necessity for medical education to address health inequities caused by socioeconomic status (SES). SES affects risk variables and healthcare access. By including socioeconomic variables in medical training, prospective

doctors can better grasp their patients' social circumstances and adapt interventions. SES and health outcomes are linked; Adler et al. (2008) recommend including it in medical education. Healthcare providers can lessen health inequities by understanding the more significant determinants of health. This is crucial in Sudan and Egypt, where socioeconomic problems affect health.

Diet, exercise, smoking, and alcohol use affect health. Sallis et al. (2008) stress the importance of health behavior education in medical education. Practical health promotion efforts need to understand ecological models of health behavior, which consider individual, societal, and environmental aspects. Medical students learn these concepts to create and implement healthy behavior interventions. Prochaska et al. (2015) advocate the transtheoretical behavior modification model for medical education. This model describes the stages of behavior change, helping healthcare workers help patients adopt healthier lifestyles. Health promotion is improved by incorporating this paradigm into medical training. In modern medical education, Lustria et al. (2013) emphasize the role of digital health interventions in changing health behaviors. Individualized web-delivered health behavior modification treatments can engage various populations. Future healthcare professionals learn to use digital health tools to promote healthy behaviors, making health education more accessible and personalized.

Social determinants of health affect health outcomes through physiological processes. Addressing health inequities requires understanding these pathways. Healthcare providers must comprehend how socioeconomic variables affect biological processes, according to Marmot and Wilkinson (2005). Health disparities result from socioeconomic, stress, and environmental factors affecting biological functioning. Including this knowledge in the medical curriculum helps future doctors comprehend the intricate relationship between social and biological elements. Sapolsky (2004) details how stress impacts health and recommends including it in medical training. Chronic stress raises blood pressure and suppresses immunity. Understanding these pathways helps identify stress's health impacts and find treatments. Stress biology in medical education helps future doctors comprehend their patients' health and the relevance of stress in illness prevention and management.

McEwen (2013) examines allostatic load or prolonged stress-induced bodily wear. Hypertension and sadness can result from allostatic stress. Medical students learn about allostatic load to identify and treat chronically stressed patients, enhancing health equity. Health inequities are exacerbated by chronic stress. McEwen and Gianaros (2010) discuss chronic stress's physiological effects and usefulness in medical education.

The socioeconomic status of an individual is an important determinant of the health status of a person due to high levels of chronic stress among low-income earners. Chronic stress can thus be recognized and treated by healthcare professionals through the assimilation of the knowledge presented in this thesis into the medical curriculum. Health disparities also have an aspect concerning environmental exposures. The authors state that healthcare professionals need to be made aware of the impact of ecological injustice on health, as presented by Brulle and Pellow (2006). Environmental threats are real and pose a threat to the quality of life, especially to poor and black individuals, as they are associated with illnesses. Ecological health education makes these problems recognizable by medical students and enables them to treat these problems. Landrigan et al. (2018) have proposed that environmental health education should be included in medical education since ecological sickness affects the globe. Pollution in the environment increases the load of illnesses in the whole world, both in the air and in the water. Such an understanding assists medical students in identifying these challenges in the clinical field and health promotion.

In their study, Zhang et al. (2018) described how air pollution influences cognitive impairment and stressed the importance of teaching environmental health to medical students. Long-term exposure to air pollutants harms the brain, reduces its capacity, and accelerates the development of dementia. The current article shows the linkages between those common factors, and future healthcare providers should familiarize themselves with these linkages in order to minimize the risks and act early.

This thesis suggests that the Right to Health needs to be incorporated into the Sudanese and Egyptian medical curricula regarding power, connections, networks, individual factors, and physiological processes. In doing so, medical education can integrate multiple studies' findings to prepare future healthcare professionals to address the various issues related to

health disparities and work towards ensuring health equity and better health outcomes for diverse populations.

7 Conclusion and Recommendations

7.1 Conclusion

A thorough and complex technique is indispensable to effectively integrating the Right to Health into medical curricula in Sudan and Egypt. This action is instrumental in improving healthcare outcomes and ensuring fairness in the distribution of health resources across these societies. At the core of this strategy is the simultaneous recognition and handling of the multidimensional nature of health inequalities originating from a wide range of systemic, relational, personal, and physiologic determinants.

The accessibility and quality of healthcare are highly influenced by the governance and power structures that exist within these countries. These systems of power encompass political units and health institutions, which inherently determine how resources are channeled and policies are affected. In contexts like Sudan and Egypt, characterized by high political instability and economic uncertainties, these structures often operate below their optimal performance levels, leading to increased inequalities in healthcare provision. Therefore, it is crucial for reforming medical education to include a critical analysis of these power dynamics concerning health equity. By doing so, future healthcare professionals will be better placed to provide medical services and advocate for systemic changes that enhance the Right to Health.

Relationships and networks, from interpersonal connections to professional collaborations, are essential in shaping health outcomes. In resource-constrained areas with myriad systemic challenges, building strong networks can transform prospects for healthcare delivery, thereby impinging upon patient outcomes. The curricula should emphasize the significance of constructing lasting relationships, thus equipping learners with knowledge of cooperation tools that yield meaningful results when utilized effectively for community-based efforts. This means that support systems act as crucial platforms through which large-scale interventions can be planned or made practical within communities' health sectors.

Consequently, personal factors such as socioeconomic status, education level, lifestyle choices, and genetic predispositions are particularly formative influences on an individual's well-being. Consequently, professional should utilize all factors since they offer personalized attention by considering facts specific to people differently than others (Markle, Fisher, & Smego Jr., 2010). Preparing for this, therefore, involves not only a deep understanding of the science of health behaviors and genetic predispositions but also a strong involvement with social sciences to comprehend and mitigate the impacts of socioeconomic inequalities on health.

Physiological pathways provide another crucial framework for understanding the nexus between social determinants and health outcomes. Chronic stress, environmental factors, and nutrition have significant biological implications that could lead to various diseases. Medical trainees should be equipped with knowledge of these pathways to diagnose and treat illnesses that are worsened due to such physiological changes. A complete comprehension of these mechanisms will enable future healthcare professionals to design more effective interventions addressing symptoms and root causes of health conditions.

In sum, incorporating the Right to Health into the Sudanese and Egyptian medical education system is a multifaceted process that demands a strategic approach to addressing complexities underpinning health equity. When examining issues like power systems within contexts, building relationships, considering individuals, or exploring physiologic routes of diseases, a medical curriculum can produce healthcare professionals who genuinely exhibit both clinical expertise and social advocates for fair healthcare provision. In conclusion, it would be wrong to see this holistic view as purely academic since everyone, irrespective of their socio-economic or geographical background, needs equitable access to quality healthcare, thereby making it a practical requirement instead.

7.2 Recommendations

Below are some recommendations that will help implement the Right to Health into medical education and, in turn, promote health equity and better outcomes.

7.2.1 Reforming Medical Education to Include Health Equity:

The medical schools in Sudan and Egypt need to expand their curricula to incorporate adequate training on the Right to Health. Thus, the University of Global Health Equity, located in Rwanda, is a model university that focuses on the principle of health equity in every aspect of its work and training. In the same way, other medical schools in Sudan and Egypt can also train future generations of healthcare workers to treat diseases while at the same time challenging the structural injustices that contribute to health inequities. This could entail collaborations with global health bodies to develop contextual syllabuses for the country and encompass the global context (Binagwaho et al., 2017).

7.2.2 Building and Strengthening Professional Networks:

It is worth understanding that networks play a crucial role in enhancing the quality of people's lives and health. From the community health programs like the community health worker model in Ethiopia, it is clear that solid professional networks can significantly improve the health care provision in rural and other hard-to-reach areas. Sudanese and Egyptian medical schools should incorporate knowledge regarding the development and organization of networks in the healthcare field, emphasizing intersectoral cooperation. This training should include the capacity to understand and use DH technologies, which have been found helpful in expanding the coverage of health services as realized in telemedicine efforts in SSA (Perry et al., 2014).

7.2.3 Emphasizing Interdisciplinary Education:

The use of interdisciplinary methods in training healthcare providers can help close the gap between the different aspects of health. For example, integrating social science into the curriculum for medical students at Harvard Medical School has helped learners grasp health's social and economic determinants. In the same way, the faculty of medicine in Sudan and Egypt should include sociology, economics, and environmental science in their curricula so that students can understand all the aspects of health phases and come up with different interrelated solutions (Frenk et al., 2010).

7.2.4 Focused Training on Chronic Stress and Physiological Pathways:

Getting acquainted with chronic stress and other social factors' effects on the human body is equally essential. The current models should be adopted in medical schools, such as the stress and resilience training at Stanford University that helps train medical students on the neurobiology of stress and teaches them how to manage stress. Such training helps future physicians understand the possible long-term impact of chronic stress on patients and how to avoid it. The same could be seen in Sudan and Egypt, most especially in the areas affected by conflicts since stress-associated health problems are widespread within such areas (McEwen et al., 2013).

7.2.5 Community-Based Participatory Research (CBPR) Integration:

CBPR has helped manage health problems affecting specific communities since it embraces the people in the research process. The application of CBPR in HIV/AIDS-related projects in South Africa shows how this approach is helpful in the development of targeted health interventions that fit the community's needs. Training students and creating chances to participate in CBPR in medical colleges in Sudan and Egypt will help the students develop meaningful research that can lead to health intervention plans appropriate to the community (Wallerstein and Duran, 2010).

7.2.6 Policy Advocacy Education:

Preparing future generations of healthcare providers on policy advocacy is relevant to institutionalizing the Right to Health. How policy advocacy has been implemented and achieved in tobacco control by public health professionals worldwide proves that medically trained advocates can shape policies and public attitudes. Sudan and Egypt should ensure that policy advocacy is included in the medical curricula to sensitize the students to engage the policymakers, use evidence-based research in advocacy, and communicate societal health policies (Chapman, 2007).

7.2.7 Enhancing Environmental Health Education:

Since environmental factors influence people's health considerably, medical education should pay attention to environmental health. The closeness medical schools have taken with ecological health research institutions in the U. S. has enabled the enhancement of

curricula focusing on the associations of environmental exposures with health impacts. Thus, Sudan and Egypt can follow this model and include ecological health into the medical curriculum to provide future healthcare workers with knowledge in managing the effects of pollution, climate change, and other environmental effects (Brulle and Pellow, 2006).

The above recommendations should be supported and followed by educational institutions, the government, and international organizations. To raise future medical professionals who would be capable not only of the clinical approach but also the social and environmental one, educational approaches in Sudan and Egypt should be oriented on the holistic view of health, which will contribute to the improvement of the health of the nation and, consequently, the health of the governments of these countries.

8 References

1. Abdel-Rahman, S., Shoaib, F., Fattah, M.N.A. and Abonazel, M.R. (2021) 'Predictors of catastrophic out-of-pocket health expenditure in rural Egypt: application of the heteroscedastic probit model,' Journal of the Egyptian Public Health Association, 96(1), pp. 1–15. Available at: https://jepha.springeropen.com/articles/10.1186/s42506-021-00086-x (Accessed: 11 July 2024).

2. Adler, N.E. and Stewart, J. (2010) 'Health disparities across the lifespan: meaning, methods, and mechanisms,' Annals of the New York Academy of Sciences, 1186, pp. 5–23.

3. Aly, A.G. et al. (2021) 'Challenges being Faced by the Elderly People in Accessing Health Services at Beni-Suef University Hospital,' Assistant Professor of Family and Community Health Nursing, Faculty of Nursing, Damietta University.

4. Balazs, C. L., and Morello-Frosch, R. (2013). 'The Three R's: How Community Based Participatory Research Strengthens the Rigor, Relevance and Reach of Science.' Environmental Justice (Print), 6(1). https://doi.org/10.1089/env.2012.0017

5. Bambra, C., Riordan, R., Ford, J., and Matthews, F. (2020). 'The COVID-19 pandemic and health inequalities.' Journal of Epidemiology and Community Health, 75(11), 964-968. https://pubmed.ncbi.nlm.nih.gov/32535550/

6. Barry, M. J., and Edgman-Levitan, S. (2012). "Shared decision making—the pinnacle of patient-centered care." New England Journal of Medicine, 366(9), 780-781.

7. Bensing, J. (2000). 'Bridging the gap. The separate worlds of evidence-based medicine and patient-centered medicine.' Patient Education and Counseling, 39(1), 17-25. https://pubmed.ncbi.nlm.nih.gov/11013544/

8. Berkman, L.F. and Glass, T. (2000) 'Social integration, social networks, social support, and health,' in Berkman, L.F. and Kawachi, I. (eds.) Social Epidemiology. New York: Oxford University Press, pp. 137–173.

9. Bach, S. (2007). Globalization and health. Bulletin of the World Health Organisation. 85. 10.1590/S0042-96862007001100020.

10. Betancourt, J.R. et al. (2005) 'Cultural competence and health care disparities: critical perspectives and trends,' Health Affairs (Millwood), 24(2), pp. 499–505.

11. Brulle, R. J., and Pellow, D. N. (2006). ‘Environmental justice: Human health and environmental inequalities.’ Annual Review of Public Health, 27, 103-124.

12. Butterfoss, F. D. (2007). ‘Coalitions and partnerships in community health.’ John Wiley & Sons.

13. Binagwaho, A. (2017). University of Global Health Equity's Contribution to the Reduction of Education and Health Services Rationing. International Journal of Health Policy and Management, 6(8), pp.427-429. Available at: https://doi.org/10.15171/ijhpm.2017.56

14. Creswell, J.W. (2014) Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Available at: https://books.google.nl/books/about/Research_Design.html?id=4uB76IC_pOQC&redir_esc=y (Accessed: 11 May 2024).

15. Chapman, S. (2007). "Public Health Advocacy and Tobacco Control: Making Smoking History." Blackwell Publishing. ISBN: 978-1-4051-5914-8.

16. Dearry, A. (2002). ‘Community-based participatory research as a tool to advance environmental health sciences.’ Environmental Health Perspectives, 110(Suppl 2), 155-159. https://doi.org/10.1289/ehp.02110s2155

17. Drobac P, and Morse M. (2016). Medical Education and Global Health Equity. AMA J Ethics. 1;18(7):702-9. doi: 10.1001/journalofethics.2016.18.7.medu1-1607. PMID: 27437820.

18. Elhadi, Y.A.M. (2022) 'Medical errors in Sudan: A call for urgent investigation and action,' Annals of Medicine and Surgery, 82. Available at: https://journals.lww.com/annals-of-medicine-and-surgery/fulltext/2022/10000/medical_errors_in_sudan__a_call_for_urgent.127.aspx (Accessed: 11 July 2024).

19. Epstein, R. M. (2011). The Values and Value of Patient-Centered Care. Annals of Family Medicine, 9(2), 100-103. https://doi.org/10.1370/afm.1239

20. Evashwick, C.J., Tao, D. and Bax, K. (2013) 'Analysis of the literature about the education of public health professionals', Frontiers in Public Health, 1(NOV): 65498. Available at: www.frontiersin.org (Accessed: 27 June 2024).

21. Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., ... and Zurayk, H. (2010). "Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world." The Lancet, 376(9756), 1923-1958. https://doi.org/10.1016/s0140-6736(10)61854-5

22. Fadul, N., Hussein, M.E. and Fadul, A.A. (2021) 'Re-opening Sudan: the Balance Between Maintaining Daily Living and Avoiding the Next Peak of COVID-19', Current Tropical Medicine Reports, 8(3), pp. 231–237. Available at: https://link.springer.com/article/10.1007/s40475-021-00237-2 (Accessed: 11 July 2024).

23. Flood, D. et al. (2017) 'Integrating human rights education in medical training,' Journal of Medical Education and Training, 1(2), pp. 17–22.

24. Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., ... and Zurayk, H. (2010). "Health professionals for a new century: transforming education to strengthen health systems in an interdependent world." The Lancet, 376(9756), 1923-1958. DOI: 10.1016/S0140-6736(10)61854-5.

25. Gouin, J.P. (2011). 'Chronic Stress, Immune Dysregulation, and Health'. American Journal of Lifestyle Medicine. 5. 476-485. 10.1177/1559827610395467.

26. Hunt, P. (2007) 'Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health, Paul Hunt: addendum', UN. Available at: https://digitallibrary.un.org/record/594900 (Accessed: 10 May 2024).

27. International Journal of Refugee Law (IJRL). (2020) 'Human Mobility and Human Rights in the COVID-19 Pandemic: Principles of Protection for Migrants, Refugees, and Displaced Persons', International Journal of Refugee Law, 32(3), pp. 549–558. Available at: https://dx.doi.org/10.1093/ijrl/eeaa028 (Accessed: 4 July 2024).

28. Ismail, M. (2020) 'Regional disparities in the distribution of Sudan's health resources,' Eastern Mediterranean Health Journal, 26(9), pp. 1105–1114. Available at: https://pubmed.ncbi.nlm.nih.gov/33047802/ (Accessed: 30 May 2024).

29. Landrigan, P. J., Fuller, R., Acosta, N. J., Adeyi, O., Arnold, R., Basu, N., ... and Zhong, M. (2018). "The Lancet Commission on pollution and health." The Lancet, 391(10119), 462-512. https://doi.org/10.1016/s0140-6736(17)32345-0

30. Link, B. G., & Phelan, J. (2001). "Conceptualizing stigma." Annual Review of Sociology, 27(1), 363-385. https://doi.org/10.1146/annurev.soc.27.1.363

31. Lustria, M. L. A., Noar, S. M., Cortese, J., Van Stee, S. K., Glueckauf, R. L., and Lee, J. (2013). "A meta-analysis of web-delivered tailored health behavior change interventions." Journal of Health Communication, 18(9), 1039-1069.

32. Meier, B.M., Taylor, A., Eccleston-Turner, M., Habibi, R., Sekalala, S. and Gostin, L.O. (2020). The World Health Organization in Global Health Law. The Journal of Law, Medicine & Ethics, 48(4), pp.796-799.

33. Massod, M.F. (2011) 'Do Victims of War Need International Law - Human Rights Education Programs in Authoritarian Sudan.'

34. Marmot, M. (2020). 'Health equity in England: The Marmot Review 10 years on.' BMJ, 368.

35. Marmot, M. (2005) 'Social determinants of health inequalities', The Lancet, 365(9464), pp. 1099–1104.

36. McEwen, B. S. (2013). 'The Brain on Stress: Toward an Integrative Approach to Brain, Body and Behavior.' Perspectives on Psychological Science: A Journal of the Association for Psychological Science, 8(6), 673. https://doi.org/10.1177/1745691613506907

37. McEwen, B. S., and Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. Annals of the New York Academy of Sciences, 1186, 190. https://doi.org/10.1111/j.1749-6632.2009.05331.x

38. Mohammed, E.S., Seedhom, A.E. and Ghazawy, E.R. (2018) 'Awareness and practice of patient rights from a patient perspective: an insight from Upper Egypt,' International Journal for Quality in Health Care, 30(2), pp. 145–151. Available at: https://dx.doi.org/10.1093/intqhc/mzx182 (Accessed: 4 July 2024).

39. Navarro, V. (2009). 'What We Mean by Social Determinants of Health.' International Journal of Health Services. https://doi.org/10.2190/HS.39.3.a

40. NTVG (2024) 'Doctors are often the first to see human rights violations.' Available at: https://www.ntvg.nl/artikelen/artsen-zien-mensenrechtenschending-vaak-als-eerste?check_logged_in=1 (Accessed: 9 May 2024).

41. Pande, A., Shalakani, A.E. and Hamed, A. (2017) 'How can we measure progress on social justice in health care? In the case of Egypt', Health Systems Reform, 3(1), pp. 14–25. Available at: https://doi.org/10.1080/23288604.2016.1272981 (Accessed: 4 July 2024).

42. Peterson, A., Charles, V., Yeung, D. and Coyle, K. (2021) 'The Health Equity Framework: A Science- and Justice-Based Model for Public Health Researchers and Practitioners', Health Promotion Practice, 22(6), pp. 741–746. Available at: /PMC/articles/PMC8564233/ (Accessed: 10 May 2024).

43. Peters, D. H., Garg, A., Bloom, G., Walker, D. G., Brieger, W. R., and Rahman, M. H. (2008). "Poverty and access to health care in developing countries." Annals of the New York Academy of Sciences, 1136(1), 161-171.

44. Prochaska, J.O., Redding, C.A. and Evers, K.E. (2015) The Transtheoretical Model and Stages of Change. In: Glanz, K., Rimer, B.K. and Viswanath, K., Eds., Health Behavior: Theory, Research, and Practice, Jossey-Bass, San Francisco, 125-148.

45. Phelan, J.C., Link, B.G. and Tehranifar, P. (2010) 'Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications,' Journal of Health and Social Behavior, 51(Suppl), no pagination.

46. Plianbangchang, S. (2018) 'Universal health coverage (UHC)', Journal of Health Research, 32(4), pp. 322–324.

47. Perry, H. B., Zulliger, R., andRogers, M. M. (2014). "Community Health Workers in Low-, Middle-, and High-Income Countries: An Overview of Their History, Recent Evolution, and Current Effectiveness." Annual Review of Public Health, 35, 399-421. DOI: 10.1146/annurev-publhealth-032013-182354.

48. Reddy, A. T., Lazreg, S. A., Bazemore, A. W., and Lucan, S. C. (2013). Toward Defining and Measuring Social Accountability in Graduate Medical Education: A Stakeholder Study. Journal of Graduate Medical Education, 5(3), 439-445. https://doi.org/10.4300/JGME-D-12-00274.1

49. Ramadan, M., Tappis, H. and Brieger, W. (2022) 'Primary Healthcare Quality in Conflict and Fragility: a subnational analysis of disparities using Population Health surveys', Conflict and Health, 16(1), pp. 1–12. Available at: https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-022-00466-w (Accessed: 27 June 2024).

50. Ruger, J. P., and Yach, D. (2014). The Global Role of the World Health Organization. Global Health Governance: The Scholarly Journal for the new Health Security Paradigm, 2(2), 1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3981564/

51. Roussos, S. T., and Fawcett, S. B. (2000). "A review of collaborative partnerships as a strategy for improving community health." Annual Review of Public Health, 21(1), 369-402.

52. Sallis, J. F., Owen, N., and Fisher, E. B. (2008). Ecological Models of Health Behavior. In K. Glanz, B. K. Rimer, and K. Viswanath (Eds.), Health Behavior and Health Education: Theory, Research, and Practice (4th ed., pp. 465-486). San Francisco, CA: Jossey-Bass.

53. Satcher, D. et al. (2010) 'Community-based training and interprofessional education: key strategies for promoting health equity,' American Journal of Public Health, 100(Suppl 1), no pagination.

54. Sapolsky, R. M. (2004). 'Why zebras don't get ulcers: The acclaimed guide to stress, stress-related diseases, and coping (3rd ed.)'. New York: Henry Holt.

55. Salako, I. (2023) 'USING THE HEALTH EQUITY FRAMEWORK TO EXPLORE DISPARITIES IN THE MANAGEMENT OF CHILDHOOD LANGUAGE DISORDERS IN IBADAN: AN EXPLORATORY STUDY,' Student's Journal of Health Research Africa, 4(6), pp. 10. Available at: https://sjhresearchafrica.org/index.php/public-html/article/view/360 (Accessed: 11 July 2024).

56. Sen, A. (2005). Human rights and capabilities. Journal of human development, 6(2), pp.151-166.

57. Steptoe, A., and Kivimäki, M. (2012). "Stress and cardiovascular disease." Nature Reviews Cardiology, 9(6), 360-370.

58. WHO (2023) Human rights. Available at: https://www.who.int/news-room/fact-sheets/detail/human-rights-and-health (Accessed: 4 July 2024).

59. WHO. (2023a). WHO EGYPT RESPONSE TO SUDAN EMERGENCY. [Online] available at https://www.emro.who.int/images/stories/sudan/WHO-Egypt-Sudan-Situation-Report-4.pdf?ua=1 [Accessed on August 01, 2024]

60. Wallerstein, N., and Duran, B. (2010). Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to

Improve Health Equity. American Journal of Public Health, 100(Suppl 1), S40. https://doi.org/10.2105/AJPH.2009.184036

61. Zhang, X., Chen, X., and Zhang, X. (2018). The impact of exposure to air pollution on cognitive performance. Proceedings of the National Academy of Sciences of the United States of America, 115(37), 9193-9197. https://doi.org/10.1073/pnas.1809474115