



Print ISSN 2207-7715
Online ISSN 2207-7723

Global Bioethics Enquiry

The Scholarly Publication of the International Chair in Bioethics
(Formerly UNESCO Chair in Bioethics)



Volume 10, Issue 3
DECEMBER 2022

The scholarly publication of the UNESCO chair of Bioethics

GLOBAL BIOETHICS ENQUIRY

Issue 10 (3)

December 2022

Editorial Board

EDITOR-IN-CHIEF

Prof. Dr. Russell D'Souza (Australia)

Director – Department of Education, UNESCO Chair in Bioethics,
Head – Asia-Pacific, UNESCO Chair in Bioethics,
Dean – International Institute of Organizational Psychological Medicine,
Melbourne, Australia.

EDITORS

Prof. Dr. Mary Mathew (India)

Head – Indian Programme, UNESCO Chair in Bioethics,
Professor, Department of Pathology,
Kasturba Medical College,
Manipal

Prof. Baroness Ilona Finlay (UK)

Past President – Royal Society for Medicine
Professor, Department of Palliative Medicine
Cardiff University School of Medicine
UK

MANAGING & ASSOCIATE EDITOR

Prof. Dr. Avinash De Sousa (India)

Founder Trustee and Consultant Psychiatrist, Desousa Foundation.
Research Associate,
Department of Psychiatry,
Lokmanya Tilak Municipal Medical College,
Mumbai.

EDITORIAL BOARD

Prof. Dr. Harischandra Gambheera (Sri Lanka)

Consultant Psychiatrist, Private Practice, Colombo
Past President – Sri Lanka College of Psychiatrists,
Past President – SAARC Federation of Psychiatrists

Prof. Dr. Derek D'Souza (India)

Professor, Department of Dentistry,
Head, MIMER Unit of the UNESCO Chair of Bioethics,
MIMER, Pune, India

Prof. Dr. Sergio Rego (Brazil)

National School of Public Health Sergio Arouca,
Oswaldo Cruz Foundation-FIOCRUZ,
Rua Leopoldo Bulhões,
Rio de Janeiro, Brazil

Prof. Dr. Shanthi Van Zeebroeck (Belgium)

In-House Counsel and Biomedical Scientist,
1000 Brussels,
Belgium

Prof. Dr. Sarosh Saleem (Pakistan)

Assistant Professor, Bioethics,
Shalamar Medical and Dental College,
Lahore, Pakistan
Founding Head of Bioethics Department
Head, SMDC Bioethics Unit of International

Prof. Dr. Rui Nunes (Portugal)

Full Professor of Medical Sociology and Bioethics
Faculty of Medicine
University of Porto
Former Director
Department of Social Sciences & Health
Portugal

Prof. Dr. Kristen Jones-Bonofiglio (Canada)

Director, Centre for Health Care Ethics,
Assistant Professor, School of Nursing,
Adjunct Professor, Department of Health Sciences,
AMS Phoenix Fellow,
Lakehead University,
Ontario, Canada

Prof. Dr. Alice Lakati (Kenya)

Dean of Graduate Studies,
Amref International University,
Nairobi, Kenya.

Prof. Dr. Dhana Ratna Shakya (Nepal)

Department of Psychiatry,
B. P. Koirala Institute of Health Sciences,
Dharan, Sunsari-18,
Nepal

Prof. Dr. Sharath K. Rao (India)

Dean,
Professor of Orthopedics,
Kasturba Medical College,
Manipal

Prof. Dr. Vivienne Harpwood (UK)

Professor of Law,
Course Director LLM Course,
Cardiff Law School
UK

Prof. Dr. Abhay Gaidhane (India)

Professor,
Department of Community Medicine and Public Health,
J N Medical College,
Wardha,
Nagpur

Prof. Dr. Joe Thornton (USA)

Consultant Psychiatrist,
UF Health Shands Hospital,
Lake City Veterans Affairs Medical Center
Glansville
Florida, USA

Prof. Dr. Princy Palatty (India)

Professor
Department of Pharmacology,
Amrutha Institute of Medical Sciences,
Kochi

Prof. Dr. Srikanth Nimmagadda (UK)

Director – Cheshwold Hospital,
Consultant in Forensic Psychiatry,
Cheshwold Hospital,
Doncaster,
UK

Prof. Dr. Rajiv Tandon (USA)

Professor of Psychiatry,
University of Western Michigan
USA

Prof. Dr. Shai Linn (Israel)

Professor,
Medicine and Epidemiology,
University of Haifa,
Israel

Prof. Dr. Ilana Belmaker (Israel)

Public Health Expert and Associate Professor,
Division of Community Health,
Ben-Gurion University of the Negev,
Israel.

Prof. Gerhard Fortwengel (Germany)

Professor,
University of Applied Science and Arts
Hannover
Germany

Prof. Dr. Vojin Rakic (Serbia)

Research Professor at the Institute for Social Sciences,
Director of the Center for the Study of Bioethics,
University of Belgrade,
Head of the European Division of the UNESCO Chair in Bioethics,
Chair of Cambridge Working Group for Bioethics Education
Serbia

Prof. Dr. Peter Mossey (UK)

Professor (Clinical),
Personal Chair of Craniofacial Dev & Dentofacial Orthopaedics,
University of Dundee,
UK

Prof. Dr. Ved Prakash Mishra (India)

Chairman,
Academic Committee,
Medical Council of India,
New Delhi

Prof. Dr. Ashima Khan (Pakistan)

Assistant Professor
Department of Bioethics
Shalamar Institute of Medical Sciences
Lahore
Pakistan

Prof. Dr. Shabbir Amanullah (Canada)

Professor of Psychiatry,
University of Western Ontario
Canada

TABLE OF CONTENTS

Contents	Page Number
Editorial Telepsychiatry – few clinical and ethical dilemmas <i>Avinash De Sousa, Russell D'Souza</i>	116–118
Review Paper Status Quo Of Healthcare Systems and Their Impact on Pharmaceutical Industry Performance in African Developing Countries: A Scoping Review <i>Vanessa Striver, Firas Fneish, Sam C. Ibeneme, Rainer Muche, Gerhard Fortwengel</i>	119–133
Review Paper Medical Ethics in a Digital Era: A Systematic Review <i>Asima Mehaboob Khan, Rizwan Taj, Aamir Naveed, Abdul Wali</i>	134–142
Original Research Paper A Cross-Sectional Study on the Perception of Faculty on Online Medical Teaching during the Three Waves of COVID-19 in a Teaching Hospital in North-Eastern India <i>Daunipaia Slong, Anamika Nath, Amar Jyoti Patowary, Amarantha Donna Ropmay, Ankith Rao Jonpelly, Shankar Kishnath, Prabal Das, Dev Ashis Ramu Damu, Amitav Sarma, Bhupen Barman, Himashree Bhattacharyya, Polina Baruah</i>	143–147
Original Research Paper Knowledge, Attitude and Practice Among the Medical And Dental Undergraduates Regarding On Whole Body Donation For Teaching Learning Purposes: A Perspectives From Bioethics- A Cross Sectional Study <i>Koirala S, Shah S, Shakya DR, Khanal L, Rimal J, Rijal A, Baral DD</i>	148–157
Ethical Viewpoint Paper Biomedical Ethics and the COVID-19 Pandemic <i>Maria Coelho, Nicholas Antao, Rouen Mascarenhas, Anu Kant Mital</i>	158–162
Ethical Viewpoint Paper Solidarity And Justice in an Individualistic World? <i>María de la Luz Casas Martínez</i>	163–166
Ethical Viewpoint Paper Designing a Workshop on Advocating Research Ethics Teaching Skills to Trainers in Academic Institutions of Developing Countries <i>Gebeyehu Tsega Nebeb, Yawkal Tsega Nebeb, Belete Fenta Kebede, Khin Thet Wai</i>	167–170
Instructions to Authors	171–175

Editorial

Telepsychiatry – few clinical and ethical dilemmas

Avinash De Sousa¹, Russell D'Souza²

¹Consultant Psychiatrist and Founder Trustee, Desousa Foundation, Mumbai.

²Chair Department of Education International Chair in Bioethics (Formerly UNESCO Chair in Bioethics) Melbourne Australia.

Corresponding Author: Avinash De Sousa

E-mail: avinashdes888@gmail.com

The COVID-19 pandemic has resulted in a widespread lockdown across India and thus there was a closure of many private clinics except for cases that needed emergency treatment. The Government and Medical Council of India had advised doctors to see patients via telephonic consultation as far as possible [1]. The biggest problem during faced during the COVID-19 pandemic has been access to proper mental health care. Patients have not been able to reach a mental health professional and multiple relapses and acute exacerbations of psychiatric illness have occurred. While mental health services have been provided via a telemedicine format there are many clinical, public health and ethical dilemmas that have arisen in the practice of telepsychiatry some of which are highlighted in this commentary.

In the view of telemedicine being practiced, majority of psychiatric consultations would happen over the phone. In India, telepsychiatry as a modality is yet to kick off in a big way although mental health telephone helplines have existed [2]. The psychiatric examination and mental status examination are best done in person and a teleconference video call may not suffice for the same in all cases. Many voluntary agencies have started telepsychiatry services offering free mental health services during the COVID-19 lockdown. Thus, while services are available, there is no stringent body, guidelines or regulations that would monitor the quality of these services and whether ethical standards are adhered to. It is important that professionals and agencies offering telepsychiatry services have professionals who are qualified and trained in this regard to some extent. Different clinicians may have different telepsychiatry approaches which may result in non-uniformity of telepsychiatry services [3].

Even though medications have been prescribed and prescriptions sent in a pdf format to patients via email, there have been issues of chemists not honoring the prescription due to the need for an original physical copy of the prescription when it comes to their guidelines. There has also been an acute shortage of many psychiatric medications due to non-availability and short supply from the drug distributors. Thus, many patients though wanting to be compliant and even after seeking a consultation online or via telephone and after procuring a fresh prescription from their doctor still have to face a shortage of medication. Thus, we will have unprecedented rise in relapses of psychiatric illnesses not due to non-compliance but due to a short supply of medication [4].

Many people have developed what has been called Corona-anxiety or Corona-phobia and they feel that they may contract the virus. Mild fever and cough may be thought of as COVID and anxiety may develop. The thought of stepping out may precipitate anxiety and this will be more in people with personalities that are predisposed to anxiety and worry [5]. Excessive protection and obsessiveness about social distancing and protection may also develop in people. Thus, first time cases where there was no history of psychiatric illness earlier, in anxiety may also call the telepsychiatry services and the dilemma arises in distinguishing them as having pure psychological issues while also referring them to another helpline where they may be medically guided. The medical helpline may also serve to increase their anxiety and stress if they are told to go in for a check-up [6].

The ethical dilemma that also may arise which is a personal one is whether one must charge for a telephonic consultation or not. On one side we have many non-governmental organizations and

voluntary agencies that along with professional bodies are offering telepsychiatry services free while the challenge for private practitioners is whether they must charge for telepsychiatry services or not. Many doctors who never charged for telephonic advice may have to charge now as their telephone consultations are the only source of income for them. The other dilemma is whether the charges would be time based or less than a face to face consultation fee and on what yardstick must these charges be based. It is important to understand that doctor's while having their own house to feed would have to maintain a fine balance between professional aspect of being a doctor and also being altruistic and maintaining the ethical standards of medicine as a noble profession [7].

The other concern is handling of psychiatric emergencies. How does one handle a patient that may be suicidal and about whom we have no details except the number he called from. Suppose he calls a psychiatrist for a telephonic consultation and expresses suicidal ideation. Then he cuts the call and switches off the mobile phone. We have no clue of what may happen to him. Do we collect names, address proofs and numbers of a relative before the telepsychiatry consultation? This may be prudent and just but may also drive away patients from seeking help who do not wish to inform family members and prefer to maintain anonymity to some extent while seeking telepsychiatry consultations. There is a need for the development of guidelines for the same [8]. The same holds true when someone on the phone may disclose domestic violence and child sexual abuse and under the law we are supposed to report such matters to local authorities. Do we refer such patients to specific helplines for these causes or do we take it on ourselves to report such matters in the wake of the already testing nature of an existing pandemic? [9].

One issue that has arisen due to the teleconsultation procedure is the rise in fake calls with the aim to seek prescriptions for benzodiazepines and other drugs of abuse including cough syrups. Many patients who may be abusing these drugs often phone multiple doctors on the phone with different names and may claim to have insomnia and panic attacks or may pose as old cases of anxiety and mention names of drugs that they were taking in order to procure a prescription for the same. They thus procure a prescription for 10 days each from 5 different doctors and get a large number of tablets of the benzodiazepines that they need and this leads to them either abusing the drug or selling it a higher price to fellow substance abusers. Thus, there is no method to monitor this and who takes up the blame of any mishap that may happen due to these prescriptions like a drug overdose [10-11].

Another ethical dilemma about responding when an adolescent calls up with a psychological problem and does not want the family members to be involved. The adolescent has probably wanted to seek psychological help always but now decides to do so with the free service. Telepsychiatry has been used with adolescents, juveniles and in school mental health but there are no guidelines for the same in India. How does one offer intervention even if counseling without parental consent and what should be the course of action in such cases [12].

The lack of availability of a standard portal to carry out telepsychiatry during the pandemic is another reason why a certain problem could arise. Telepsychiatry portals advertise using names of doctors and their personal phone numbers and use WhatsApp or Skype as a medium for communication. The lack of privacy and chances of these accounts being hacked is another issue as many times personal chats here are intertwined with personal chats and groups. Guidelines on storage of records of teleconsultations, chats and legal aspects of these services is another dilemma of the telepsychiatry movement [13-14].

There is a need for developing software packages with codified medical knowledge as an aid to assessment, diagnosis, and management and a logical decision support system for diagnosis and management will have to be incorporated. Robust facilities for video recording, tele-conferencing, and creation of electronic medical records will be required. Telepsychiatry, thus, holds enormous potential and needs to be permanently available rather than just in times of emergencies and pandemics. We must also set up procedural guidelines and recommendations as the field grows. Indian studies on reliability, efficacy, and cost-effectiveness of telepsychiatry also need to be carried out in the future in both rural and urban settings [15-16].

There is a need to seriously look at telepsychiatry as a means to reach the unreached and exploit the potential of mobile telepsychiatry in India. Telepsychiatry facilities needs to operate around the clock and must look after psychiatric emergencies all over India [17]. Thus, these dedicated

telepsychiatry consultation facilities need to be set-up in cities to provide consultation and also guide the primary care physicians in making community mental health stronger and more durable. While doing so, many of the ethical and public health dilemmas discussed above also need to be handled and solutions for the same must be provided.

REFERENCES

1. Retrieved from <https://www.mohfw.gov.in/pdf/Telemedicine.pdf>
2. Malhotra S, Chakrabarti S, Shah R. Telepsychiatry: Promise, potential, and challenges. *Indian J Psychiatry* 2013;55(1):3-11.
3. Knopf A. Telepsychiatry coming into its own with COVID-19. *Brown Univ Child Adolesc Psychopharmacol Update* 2020;22(5):1-3.
4. Kavoor AR. Covid-19 in People with Mental Illness: Challenges and Vulnerabilities. *Asian J Psychiatry* 2020; Available online April 8:(ahead of print).
5. Naguy A, Moodliar-Rensburg S, Alamiri B. Coronaphobia and Chronophobia—A Psychiatric Perspective. *Asian J Psychiatry* 2020; Available online Apr 10:(ahead of print).
6. Rajkumar RP. COVID-19 and mental health: A review of the existing literature. *Asian J Psychiatry* 2020; Available online Apr 10:(ahead of print).
7. Liu S, Yang L, Zhang C, Xiang YT, Liu Z, Hu S, Zhang B. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;7(4):e17-8.
8. Yellowlees P, Burke MM, Marks SL, Hilty DM, Shore JH. Emergency telepsychiatry. *J Telemed Telecare* 2008;14(6):277-81.
9. Shore JH, Hilty DM, Yellowlees P. Emergency management guidelines for telepsychiatry. *Gen Hosp Psychiatry* 2007;29(3):199-206.
10. Zheng W, Nickasch M, Lander L, Wen S, Xiao M, Marshalek P, Dix E, Sullivan C. Treatment Outcome Comparison between Telepsychiatry and Face-to-face Buprenorphine Medication-Assisted Treatment (MAT) for Opioid Use Disorder: A 2-Year Retrospective Data Analysis. *J Addict Med* 2017;11(2):138-44.
11. Zaylor C, Nelson EL, Cook DJ. Clinical outcomes in a prison telepsychiatry clinic. *J Telemed Telecare* 2001;7(suppl 1):47-9.
12. Myers K, Cain S. Practice parameter for telepsychiatry with children and adolescents. *J Am Acad Child Adolesc Psychiatry* 2008;47(12):1468-83.
13. Hyler SE, Gangure DP. Legal and ethical challenges in telepsychiatry. *J Psychiatr Pract* 2004;10(4):272-6.
14. Sabin JE, Skimming K. A framework of ethics for telepsychiatry practice. *Int Rev Psychiatry* 2015;27(6):490-5.
15. Thara R, John S, Rao K. Telepsychiatry in Chennai, India: The SCARF experience. *Behav Sci Law* 2008;26(2):315-22.
16. Sharan P, Malhotra S. Telepsychiatry: The Bridge across the access gap in child and adolescent mental health. *J Indian Assoc Child Adolesc Ment Health* 2007;3(1):18-20.
17. Math SB, Moirangthem S, Kumar NC. Tele-psychiatry: After mars, can we reach the unreachable?. *Indian J Psychol Med* 2015;37(2):120-1.

Acknowledgements – Nil

Source of Funding – Nil

Conflict of Interest – Nil

Status Quo Of Healthcare Systems and Their Impact on Pharmaceutical Industry Performance in African Developing Countries: A Scoping Review

Vanessa Strüver¹, Firas Fneish², Sam C Ibeneme³, Rainer Muche⁴, Gerhard Fortwengel⁵

¹Hochschule Hannover, University of Applied Sciences and Arts, Faculty III – Media, Information, and Design, Hannover, Germany

²Leibniz University Hannover, Institute for Cell Biology and Biophysics, Biostatistics Department, Hannover, Germany

³University of Nigeria, Enugu Campus, Faculty of Health Sciences, Department of Medical Rehabilitation, Enugu, Nigeria

⁴Ulm University, Institute for Epidemiology and Medical Biometrics, Ulm, Germany

Corresponding author: Vanessa Strüver

E-mail: vanessa.struever@gmail.com

ABSTRACT

Economic and political/governmental infrastructural factors are major contributors to the economic development/growth of all sectors of a country, such as in the area of healthcare systems and clinical research, including the pharmaceutical industry. But what is the interaction between economic, and political/governmental infrastructural factors and the development of healthcare systems, especially, the performance of the pharmaceutical industry?

Information from selected articles of a literature search of PubMed and by using Google Advanced Search led to the generation of five categories of infrastructural factors, and were filled with data from 41 African Countries using the World Health Organization data repository. Median changes over time were given and tested by Wilcoxon signed-rank test and Friedman test, respectively.

Analysis of factors related to availability of healthcare facilities showed that physicians and pharmacies were significant increased, with insignificantly decreased number of hospital beds. Healthcare Financing by the Government showed notable differences. Private health spending decreased significantly unlike Gross National Income. Analysis of infrastructural factors showed that stable supply of electricity and the associated use of the Internet improved significantly. The low level of data on the expansion of paved road networks suggests less developed medical services in remote rural areas.

Healthcare systems in African countries improved over the last two decades, but differences between the individual countries still prevail and some of the countries cannot yet offer an attractive sales market for the products of pharmaceutical companies.

Keywords: African countries, Economic and political/governmental infrastructural factors, healthcare systems, clinical research, performance of the pharmaceutical industry.

Introduction

The level of development of a country is mainly reflected by its economic performance. A large contribution to this economic development is made by the country's infrastructure [1]. In the economic sense, the term infrastructure stands for the establishment of companies and structures through which diverse goods can be produced and trade transactions can be conducted in various

areas of the economy [1]. However, in the political or governmental sense, the term encompasses various infrastructural factors, such as transportation systems, power and water supply, information technology, mechanised agricultural, and public sectors such as healthcare systems, and security among others [1]. These infrastructural factors contribute substantially to serving the country's population and play a major role in a country's economic development [1]. A diverse economy warrants a multi-sectoral investment for infrastructural development to guarantee availability of goods and services that makes a country self-reliant. The intersectoral connection of a nation's economy implies that as infrastructure in one sector develops, it enhances the growth of other related sectors. If the expansion of above infrastructural factors influences multisectoral socioeconomic outcomes then an impact could also be assumed in the area of healthcare systems and clinical research, including the pharmaceutical industry [2-4]. This relationship is particularly evident when a natural event occurs, such as a flood disaster. Here, the population of the affected region not only loses their property, but the entire infrastructure and economy are immensely damaged. This causes a collapse in medical care and the risk of waterborne disease outbreaks such as cholera, rotavirus or typhoid increases sharply [5].

Fundamental infrastructural deficiencies commonly found in developing African countries such as poor road networks [6-7], should be contributory to limited access to healthcare, and a shortage of medical personnel in locations of need which are significant barriers to healthcare services. Thus, when Falchetta *et al* advocated a prioritization of the medical infrastructure by the responsible decision makers as a necessary basis to equalize the existing inequality of medical care between the individual countries [8], it should also imply a consideration for multisectoral development. This vision was aptly captured by in the Millennium Development Goal (MDG), adopted by the United Nations Millennium Assembly in 2000 of which the eighth goal states that access to affordable essential medicines in developing countries should be provided in collaboration with pharmaceutical companies to reduce extreme diseases [9]. This implies also an investment in local infrastructural development that will support the operations of pharmaceutical industries. Invariably, infrastructural factors, such as the expansion of the road network or the connection to a stable electricity supply, could probably play a significant role in the attractiveness of the national sales market for pharmaceutical companies, since comprehensive medical care with distribution of the corresponding medical products can only reach rural regions, for example, if there is a good road connection to these regions.

But the question is: what conditions do pharmaceutical companies need in emerging African countries in order to offer their products there and contribute to comprehensive medical care for the population? An answer should include availability of hospitals/medical care facilities and the need for pharmacies to be set up so that the products can be prescribed and dispensed to the population [10]. However, there is also a cost factor which is contingent on the willingness of governments to provide financial security for healthcare. Contrary to this expectation, many government systems in African countries hardly cover the costs of medical care, and thus a large part of the healthcare costs are met by out-of-pocket expenditure. This contradicts the marketing strategy of pharmaceutical companies, which is usually economically-oriented, to offer their products as profitably as possible.

Methodology

To understand the basic interaction between infrastructural factors and the economic development of a country, a scoping review was conducted according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA statement) flow diagram [11].

Information Sources and Search strategy:

Literature on the interaction between infrastructural factors and the economy was first searched in the PubMed database and Google Advanced Search. Relevant search terms were identified by checking through the National Library of Medicine Database and, further, by going over a recent review of infrastructural relationship with healthcare system development. The search term "How businesses are affected by infrastructure" was used. Other specific keywords and MeSH terms utilised in the search include (but are not limited to) African countries, Economic and

political/governmental infrastructural factors, healthcare systems, clinical research, performance of the pharmaceutical industry etc., and implementation outcomes such as transportation systems, power and water supply, information technology, and mechanised agricultural development, healthcare systems development, clinical research, performance of the pharmaceutical industry, healthcare financing by the government (both general government healthcare and per capita healthcare expenditures). Additionally, recent narrative reviews, systematic and meta-analytic reviews of infrastructural development, clinical research development and performance of pharmaceutical industry in Africa were scanned for relevant citations. Filters such as free full-text availability, limitation of publication period, and article language only were applied to reduce the number of search results. The final search was limited to articles published in English language within the last 5 years. In addition, a search of the World Wide Web was performed via Google Advanced Search using the same search term. This search was also limited to articles published in English language between January 1, 2017, and November 30, 2021. The literature selected using PubMed and Google Advanced Search was screened by review of title and abstract. After exclusion of duplicates, articles that appeared to be thematically appropriate according to the abstract were subjected to full text review by the author. Articles that included any potential relationship between economic and political or governmental infrastructural factors and economic performance were retained. The search strategy according to the PRISMA statement is presented in Figure 1.

Based on information of the final reviewed articles, five categories of infrastructural factors could be formed to initialize the analysis of different health data taken from the World Health Organization's data repository. Various health data were taken from the Atlas of Health Statistics 2011 - Health Situation Analysis in the African Region [12] and the Atlas of African Health Statistics 2016 - Health Situation Analysis of the African Region [13]. Both documents were published by the Regional Office for Africa of the World Health Organization. In addition, The Global Health Observatory database [14] managed by the World Health Organization was used as a supplementary source for data collection on the number of hospital beds, medical doctors and pharmacists. Data analysis was done to get an overview of the current state of healthcare systems in various developing countries in the African region.

Selection of Countries

The research question was addressed exclusively to emerging economies that are members of the African Region according to the World Health Organization. Since the African continent hosts a large number of developing countries and, moreover, Africa seems to be the only market that can still offer real growth to the pharmaceutical industry [15], the analysis refers to the developing countries of the African region as defined in the World Health Organization's list of countries [16]. These are only emerging countries defined according to the Development Assistance Committee (DAC) list of the Official Development Assistance (ODA) recipients of the Organisation for Economic Co-operation and Development, effective for reporting on 2011 flows, as countries with a lower-middle income of USD1 006 - 3 975 gross national income (GNI) per capita in 2010 or an upper-middle income of USD3 976 - 12 275 [17]. African countries with a higher income, such as Egypt or Morocco, are not considered in the further analysis. The 47 countries listed in Table 1 are selected for the first data check.

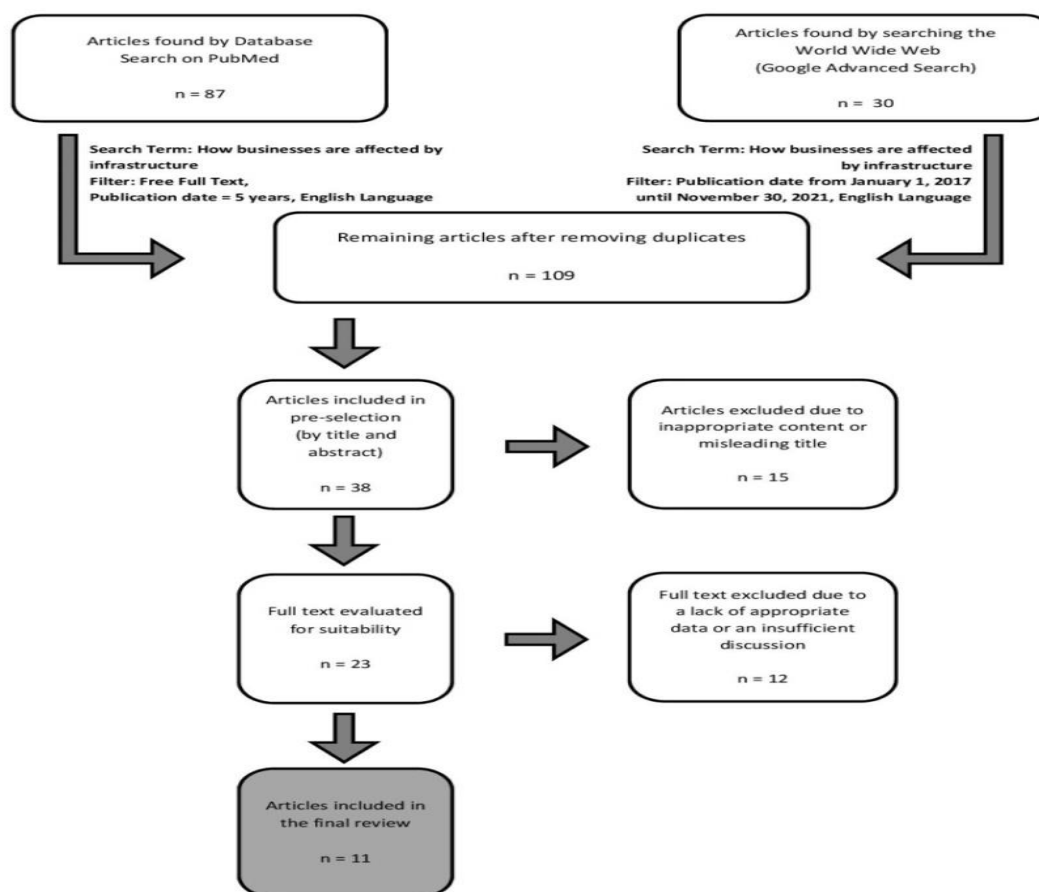


Figure 1: Preferred reporting items for systematic reviews and meta-analysis flow diagram presenting the search strategy

Selection of an appropriate Time Period

In order to provide information about potential trends in past developments over the past two decades in addition to the current state of healthcare systems, datasets of the World Health Organization's data repository from 1995, 2000, 2007, and 2013 were included in the analysis where available.

Selection of studied Infrastructural Factors

The economic and political or governmental infrastructural factors were selected according to the defined factor categories availability of healthcare facilities, access to essential medicines, healthcare financing by government, private healthcare spending and status of infrastructure as shown in Table 2.

Table 1: Countries of the African Region according to the World Health Organization

Algeria	Eswatini	Namibia
Angola	Ethiopia	Niger
Benin	Gabon	Nigeria
Botswana	Gambia	Rwanda
Burkina Faso	Ghana	Sao Tome and Principe
Burundi	Guinea	Senegal
Cabo Verde	Guinea-Bissau	Seychelles
Cameroon	Kenya	Sierra Leone
Central African Republic	Lesotho	South Africa

Chad	Liberia	South Sudan
Comoros	Madagascar	Togo
Congo	Malawi	Uganda
Cote d'Ivoire	Mali	United Republic of Tanzania
Democratic Republic of Congo	Mauritania	Zambia
Equatorial Guinea	Mauritius	Zimbabwe
Eritrea	Mozambique	

Table 2: Selected infrastructural factors according to the defined factor categories

Category	Factor
Availability of healthcare facilities	- Hospital beds - Medical doctors
Access to essential medicines	- Pharmacists
Healthcare financing by government	- Government health expenditure - Government health expenditure per capita
Private healthcare spending	- Out-of-pocket expenditure - Gross national income
Status of infrastructure	- Paved roads - Access to electricity - Internet users - Urban population

The availability of healthcare facilities and access to essential medicines are obviously necessary factors in measuring the development of a healthcare system. The more hospital beds, doctors and pharmacists are available per 10.000 population, the higher the status of the healthcare system in the country and thus its development. In this context, the financial support provided by the state government also allows conclusions to be drawn about the importance of the healthcare system. Here, an increase in per capita spending on healthcare over a certain period of time would indicate a further development of the healthcare system, for example, through the introduction of state health insurances. On the other hand, a decline in private spending on healthcare would underline these developments in the healthcare system. However, private spending must be seen in conjunction with gross domestic product, since an increase in salaries, for example, could also bring a slight increase in healthcare costs. Since a healthcare system cannot be established or developed without an expansion of the infrastructure, infrastructural factors such as the expansion of the road network or access to a stable electricity supply are of interest related to the research question. Overall, all of these factors allow conclusions to be drawn about the current state of development of the healthcare systems in selected emerging countries in the African region and the associated attractiveness for pharmaceutical companies.

Selection of Statistical Methods

The collected data are initially analysed descriptively for each selected factor including mean, standard deviation, minimum, median, and maximum, and the median changes and given in tables. They were also presented graphically for each factor using BoxPlots in the supplement. Nonparametric tests were used because of questionable normal distribution of data. Subsequently, the median change of the factors with two measurement points (hospital beds, physicians, pharmacists, out-of-pocket expenditures) was examined with the Wilcoxon signed-rank test [18-19]. The other factors (Government Health Expenditure, Government Health Expenditure per Capita, Gross National Income, Access to Electricity, Internet Users, Urban Population) are given in more than two time points and were analysed by the Friedman test for repeated measurements

[18-19]. For all tests the significance level is set to $\alpha=0.05$. Because of the explorative Design no adjustment for multiple testing was done. All descriptive analyses and analytical statistical tests are performed using the statistical software R version 3.6.1 as well as SPSS Statistics version 26. It was also used to map the development of the different factors of the healthcare systems within the last two decades (see Supplement).

Results

Analysed Countries of the African Region

Out of the original 47 emerging countries that belong to the African region as member states of the World Health Organization, four countries had to be excluded from the analysis. The data sets on the Central African Republic, Equatorial Guinea, Eswatini and South Sudan were incomplete, so that comparability of all countries within the individual factors could not be ensured. In addition to the countries with incomplete data, the two tourist hotspots Mauritius and Seychelles were also excluded from further analysis, as they have different non-comparable financial capabilities due to booming tourism and achieved by far the highest scores in all factors examined. This would significantly distort the actual results and lead to erroneous conclusions about the development of the healthcare systems and the associated attractiveness for the pharmaceutical industry. Both countries would probably not be as developed without the financial income from tourism, and this would probably also not ensure the comparability of all countries with one another. Thus, only the 41 countries shown in black in Table 3 were included in the final analysis, while the countries with a grey background were not considered.

Availability of Healthcare Facilities

A more detailed review of the mean values of the Availability of Healthcare factors revealed that the number of physicians increased between 2000 and 2007, while the number of hospital beds showed a decrease according to their mean values (Table 4). The statistical tests on the other hand confirm the significant increase in the number of physicians but cannot prove the basically assumed decrease in hospital beds to be statistically significant. This means that the decrease need not have occurred generally in each country. When looking at the individual overview of the total number of hospital beds per 10.000 population and country attached in Supplement, it becomes clear that only some countries actually showed a decrease in hospital beds, while some countries showed constant numbers or even an increase in the number of beds.

Table 3: Finally analysed Countries of the African Region

Algeria	Eswatini	Namibia
Angola	Ethiopia	Niger
Benin	Gabon	Nigeria
Botswana	Gambia	Rwanda
Burkina Faso	Ghana	Sao Tome and Principe
Burundi	Guinea	Senegal
Cabo Verde	Guinea-Bissau	Seychelles
Cameroon	Kenya	Sierra Leone
Central African Republic	Lesotho	South Africa
Chad	Liberia	South Sudan
Comoros	Madagascar	Togo
Congo	Malawi	Uganda
Cote d'Ivoire	Mali	United Republic of Tanzania
Democratic Republic of Congo	Mauritania	Zambia
Equatorial Guinea	Mauritius	Zimbabwe
Eritrea	Mozambique	

Table 4: Statistical analysis of factors on Availability of Healthcare Facilities and Access to Essential Medicines

Infrastructural Factor	Descriptive Parameter	2000-2007	2008-2015	Difference	Wilcoxon P
Hospital Beds (per 10.000 population)	N (Countries)	41	27	27	0.078 (n=27)
	Mean	11.368	11.085	-1.215	
	Standard Deviation	7.7783	7.5837	3.1273	
	Minimum	2.0	1.0	-13.0	
	Median	9.000	8.000	0.000	
	Maximum	32.0	29.0	2.0	
Medical Doctors (per 10.000 population)	N (Countries)	41	41	41	<0.001 (n=41)
	Mean	1.6068	2.1532	0.5463	
	Standard Deviation	2.29396	3.08723	1.22303	
	Minimum	0.13	0.17	-2.11	
	Median	0.7800	1.0200	0.2400	
	Maximum	11.96	18.33	6.37	
Pharmacists (per 10.000 population)	N (Countries)	40	34	34	0.005 (n=34)
	Mean	0.29263	0.60647	0.3163	
	Standard Deviation	0.529849	1.069306	0.71932	
	Minimum	0.004	0.004	-0.24	
	Median	0.0775	0.12000	0.0455	
	Maximum	2.350	4.450	3.14	

Access to Essential Medicines

Both the results of the descriptive and the statistical analysis showed significant increases in the availability of pharmacists (Table 4). This was certainly a significant change for distribution of the pharmaceutical companies' products.

HealthCare Financing by the Government

The results of the descriptive and analytical analyses showed that both the per capita healthcare expenditures of the governments and the general expenditures of the state governments invested in healthcare, showed clear differences between the various measurement points, but no clear linear increase or decrease is evident (Table 5). Thus, one could speak of an increase between 1990/1995 and 2007/2008 with a subsequent decrease until 2013. This significant decrease between the two measurement dates 2007/2008 and 2013 is also confirmed by the supplementary Wilcoxon signed-rank tests carried out for these factors (Supplement). Accordingly, this could mean that state governments initially invested more financial resources in the further development of healthcare systems and that lower financial resources are now sufficient to maintain current healthcare provision. At this point, it would have to be investigated whether the lack of funds is compensated by international health programs or development funds, for example.

Private Healthcare Spending

While the analytical tests clearly show that Gross National Income increased significantly over the period (Table 5), private health spending has demonstrably declined (Table 6). This suggests that people could build up more financial reserves and that governments could make healthcare more affordable for people through more international funding.

Table 5: Statistical analysis of factors on Government's Healthcare Financing and Private Healthcare Spending

Infrastructural Factor	Descriptive Parameter	1990/1995	2000	2007/2008	2013	Friedman P
Government Health Expenditure (in %)	N (Countries)	33	41	41	40	0.004 (n=33)
	Mean	8.294	8.556	10.327	10.857	
	Standard Deviation	2.5605	3.3821	3.8243	4.3416	
	Minimum	3.0	0.4	4.0	3.6	
	Median	8.200	8.800	10.700	10.300	
	Maximum	14.2	17.9	19.5	24.3	
Government Health Expenditure per Capita (in \$)	N (Countries)	39	40	41	40	<0.001 (n=38)
	Mean	43.44	85.30	135.37	120.53	
	Standard Deviation	53.277	124.002	192.419	154.383	
	Minimum	1	8	17	14	
	Median	22.00	47.50	71.00	49.50	
	Maximum	189	551	819	577	
Gross National Income (in \$)	N (Countries)	36	38	39	41	<0.001 (n=34)
	Mean	1432.22	1701.84	2466.15	3587.80	
	Standard Deviation	1892.984	2189.445	3149.927	4111.009	
	Minimum	270	300	290	680	
	Median	740.00	910.00	1230.00	1750.00	
	Maximum	9700	9960	13100	17220	

Status of Infrastructure:

Considering the mean values of the infrastructural factors and the corresponding median changes according to the analytical tests reflect a significant improvement in stable electricity supply and Internet use (Table 7). Even though in 2013, only an average of 35.6% of the population had access to a stable electricity supply, and of these, just an average of 9.8% use the Internet.

On the other hand, the low figures for the expansion of the paved road network suggest less developed medical care in the remote villages that are difficult to access. Figure 2 shows that in 2007, only 4 of the 41 countries in the African region had more than 50% of their roads paved. In

37 countries, not even 30% of the existing roads have a solid road surface. Even South Africa, as the African country with the highest adaptation to Western habits, has only 17% paved roads of all existing roads. Nigeria, with a share of 15%, also belongs to this group.

Table 6: Statistical analysis of factors on Private Healthcare Spending

Infrastructural Factor	Descriptive Parameter	1995	2013	Difference	Wilcoxon P
Out-of-pocket Expenditures (in %)	N (Countries)	33	40	33	0.004 (n=33)
	Mean	43.03	35.63	-6.8788	
	Standard Deviation	18.769	17.800	11.51563	
	Minimum	6	5	-31.00	
	Median	46.00	35.50	-7.0000	
	Maximum	73	73	14.00	

This assumption is supported by the significant demonstrable increase in urbanization. Overall, it can be concluded that the healthcare systems have certainly developed further over the past two decades. Significant changes could be identified by means of the statistical analyses, even if these changes are not yet large enough in most countries in consideration of the individual analyses in Supplement, there are still large differences between the countries.

Table 7: Statistical analysis of factors on Infrastructure

Infrastructural Factor	Descriptive Parameter	1990/1995	2000	2007/2008	2013	Friedman P
Access to Electricity (% of population)	N (Countries)	n.a.	32	39	40	<0.001 (n=31)
	Mean	n.a.	23.772	31.141	37.773	
	Standard Deviation	n.a.	19.7181	21.4698	22.8846	
	Minimum	n.a.	2.7	1.2	6.9	
	Median	n.a.	16.100	30.000	36.450	
	Maximum	n.a.	73.6	82.7	86.4	
Internet Users (in %)	N (Countries)	n.a.	41	41	41	<0.001 (n=41)
	Mean	n.a.	0.593	3.4712	13.034	
	Standard Deviation	n.a.	1.1540	3.40074	12.1310	
	Minimum	n.a.	0.0	0.22	1.0	
	Median	n.a.	0.200	2.2600	9.800	
	Maximum	n.a.	5.3	14.59	49.0	

Urban Population (in %)	N (Countries)	41	41	41	41	<0.001 (n=41)
	Mean	30.37	35.24	39.05	41.10	
	Standard Deviation	14.268	16.126	17.448	17.203	
	Minimum	5	8	10	12	
	Median	29.00	34.00	37.00	40.00	
	Maximum	69	80	85	87	

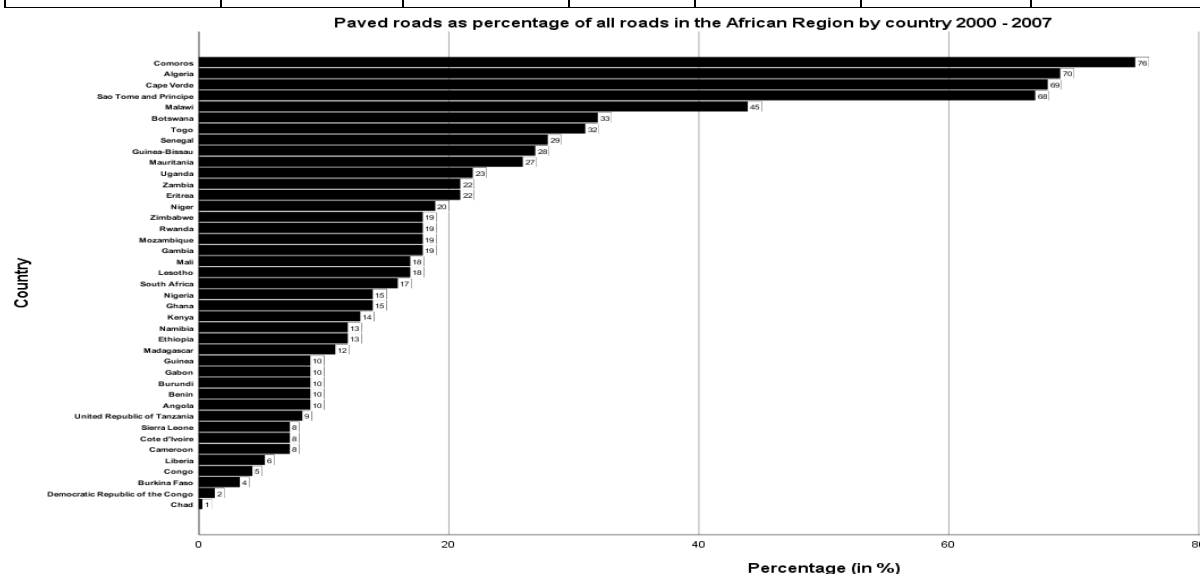


Figure 2: Paved Roads as percentage of all roads as average of the time period 2000-2007

Discussion

Considering the results presented, it is evident that the health systems of emerging countries in the African region have evolved and improved overall over the past two decades. According to Kolleye, the Access to Medicine Foundation report also speaks of "massive improvements in global health in the past decades" [20]. In the past ten years alone, the number of people without access to adequate healthcare has been reduced by 10% [21]. The United for Africa group of aid and development organizations believes that this is due in part to the Millennium Development Goals and the Sustainable Development Goals introduced in 2016 [21]. Nonetheless, there are still wide disparities between countries, which means that adequate healthcare is not a natural part of life in many African countries [21]. According to a study by the African research institute afrobarometer, around 50% of people in many African countries still have consequently no or inadequate access to healthcare [21].

Reasons for these disparities are seen in various areas. United for Africa, for example, takes a very critical view of the role of governments, since many African countries do not yet have sufficient laws to equalize the large differences between rural regions and urban centres and to stop the corruption of medical personnel politically [21]. The Access to Medicine Foundation, however, sees lack of research by the pharmaceutical industry as a significant reason [20]. It's report states that "91 of 138 urgently needed drugs, vaccines, diagnostic tests or devices identified by the World Health Organization have yet to be developed, and 16 prioritised diseases have no projects at all" [20]. To make medicines available to people in developing countries, drug firms need to do more [20]. However, improving healthcare in these countries cannot be addressed by one area alone, but rather by an interaction of both areas, which must ultimately lead to stabilization of healthcare in African countries with assurance of access to needed medicines. Close collaboration of pharmaceutical industry with national governments and other partners should thus be sought [20].

The economic and political or governmental infrastructural factors examined in this paper are also presented, according to the business and strategy consulting firm McKinsey & Company, as potential difficulties that hinder the pharmaceutical industry from successfully collaborating to improve healthcare in African countries. The lack of road infrastructure represents a good example in this context, as it makes it impossible to transport medical products to rural areas in many countries and denies the population access to medical products [22]. In addition, the electricity supply in these areas is often unstable, so that Internet use is not possible and technologically modern medical care services, such as telemedicine and online consultations in particular, cannot be used. This largely poor information and communication technology infrastructure thus hinders widespread medical care and makes it difficult for the pharmaceutical industry to distribute its medical products nationwide. This also limits the sales market and the supply of drugs, vaccines, blood products and medical devices. It is therefore not surprising that in most countries the population is increasingly moving to the cities and these are becoming population centres with better logistical infrastructure and medical care as well as higher purchasing capacity and access to modern medicine [22]. There (i.e. in the cities), the proportion of the population that has access to the services of the healthcare system is increasing, and it is becoming more and more obvious that not only communicable diseases such as tuberculosis, HIV or malaria are major challenges for African countries, but also that the so-called non-communicable diseases such as heart attack, diabetes or stroke are increasingly present in countries such as Nigeria or South Africa [22]. This offers the pharmaceutical industry the opportunity to focus on population centres and market their products there, which are already effective in the area of non-communicable diseases [22, 23]. In addition, the development of new marketing channels is also beneficial, such as by forming new partnerships with local partners who can establish new supply chains or telemedicine portals to reach populations in more remote rural areas [15, 23]. In addition to infrastructure development, it would also be important to improve health system services. The focus here is, of course, on creating more hospital beds and recruiting qualified medical staff. Data on the availability of healthcare facilities and access to essential medicines confirm the lack of well-trained professionals and medical care centres mentioned by Ascher *et al.* [22] even though there has been a fundamental increase in the last two decades. Thus, in some countries, such as Nigeria, it is not uncommon to find a kind of medical tourism to India or South Africa [23]. South Africa, as country with Western structures, has a relatively solidly developed healthcare system with a correspondingly attractive drug sales market [10]. Therefore, medical tourists over there often also receive better medical care at relatively lower costs than in their home country.

The governments of most countries invest only a small part of their total budget in healthcare, which often covers only basic care [22]. Over the last two decades, this proportion has increased in most countries, in line with the per capita spending of governments on healthcare, but the population still has to pay a certain proportion of healthcare costs out of their own pockets. In some countries, private health insurance is available to cover a certain portion of healthcare costs, but only a small percentage of the population can afford the required insurance premiums. For example in Nigeria, according to Holt *et al.* [23], 70% of healthcare expenses still have to be paid privately, and only about 5% of households are financially able to cover these expenses. Thus, it is reasonable that a large proportion of the population first visits pharmacists - and especially unlicensed ones with limited experience and less effective devices - before consulting trained physicians for medical problems [23]. In addition, counterfeit drugs and parallel imports compete with licensed original drugs [23]. These medicines are often sold in retail kiosks or informal outlets [24]. For example, according to Conway *et al.* [10], the import rate of over-the-counter and prescription drugs in sub-Saharan Africa is between 70% and 90%.

In order to boost the performance of the pharmaceutical industry including their clinical research activities, close cooperation with the governments of developing countries is inevitable, e.g., innovative prices for medical products can be offered that are adjusted to the countries' gross domestic product in order to provide the population with access to low-cost but high-quality drugs

from a financial perspective. This means that the pharmaceutical industry must adapt to the financial resources of consumers and deviate from its "policy to maintain high drug prices and hold on to exclusive rights for their production" [25]. Further improvement of the business model would probably also be beneficial for the conquest of national sales markets in African countries. Governments would need to take more and more control over the prices of medical products, legislate on wholesale and retail profit margins, and impose import restrictions to encourage limited national production of medical products [23]. Using Nigeria as an example, efforts should be focused on the large patient groups in urban areas, which are primarily middle class and more likely to afford original drugs [26]. At the same time, efforts should be made to market a second, cheaper product to a wider population mass in order to reach as many segments of the population as possible [26]. Collaboration between the pharmaceutical industry and state governments would also allow for continuous improvement in regulatory quality standards so that counterfeit, expired, or non-standard drugs could gradually be further eliminated from national outlets [10]. This would not only save countless patient lives, but also allow for fair trade [10]. According to Holt et al. [15], annual growth of about 6% in prescription and over-the-counter medicines, 9% in generics, and as much as 11% in medical devices has already been observed in recent years. Furthermore, it would be advisable for the economic existence of the pharmaceutical industry in developing countries if companies start to think beyond their original business models, for example, by developing medical products specifically for local conditions, such as much more heat-resistant products [26]. Overall, therefore, it would make sense for the pharmaceutical industry to build strong local teams that are familiar with local conditions and can work closely with the state government [15]. Regardless of all the factors discussed, however, the pharmaceutical industry must be willing to actually implement its slogans about care for global health and finally become part of the solution instead of remaining part of the problem [25]. In this context, a uniform sales market with standardized framework conditions for the approval and marketing of medical devices would be a beneficial impulse, for example, to enable the pharmaceutical industry to obtain a central drug approval that is valid for several countries in parallel. Currently, a drug approval is only recognized nationally without automatically authorizing marketing in neighbouring countries [10]. Consequently, the bureaucratic burden is much higher in developing African countries. This standardization and harmonization of regulatory requirements would enable cross-national cooperation, allowing smaller countries to advance their development and improve medical device supply chains [10]. On the one hand, this would ultimately translate into health systems development with improved medical care for the population. On the other hand, the pharmaceutical industry would no longer use these countries as testing grounds for their products to be marketed mainly in Western markets, but would have sufficient incentives to also use national markets for marketing.

Limitations

The following limitations to the research question were identified. Firstly, only published data from the World Health Organization were used, as both the 2011 and 2016 Atlas of Health Statistics examined the same parameters due to their broadly identical structure. This ensured proper comparability of the data and provided a comprehensive view of the development of health systems over the past two decades. Secondly, the World Health Organization's The Global Health Observatory database used in this review lacked consistent annual data on different countries, which made it necessary to create time periods in order to present the trends in some parameters. These contained data from different years that were representative of that time period.

Conclusions

Implications for practice

By means of the economic and political or governmental infrastructural factors examined, it was possible to map the current state of development of the healthcare systems of various African developing countries. It is evident that, although all countries have undergone further development in the context of globalization, there are still differences in economic development between the individual countries.

These differently developed healthcare systems in African countries also offer a sales market with growth potential in the future. This offers the pharmaceutical industry a promising opportunity to successfully market its products, as the sales markets in the developed countries are mostly stagnating [15]. However, in order to benefit from this growth potential, the pharmaceutical industry must understand the aforementioned infrastructural challenges first and actively participate in overcoming them, i. e. by adaptation to the financial resources of the consumers [15]. Indeed, even though an infrastructurally fully developed healthcare system would be desirable for the pharmaceutical industry to be able to market its products profitably without effort, its active participation in the development of healthcare systems, by being a cooperation partner of national governments, is imperative to achieve comprehensive medical care for the country's population. Compared to the healthcare systems of fully developed countries, those of developing countries are far less developed, so that a pure presence of the pharmaceutical industry with its general business models would not be promising here in order to survive on the national sales markets [26]. Adaptation to the different local conditions is therefore inevitable. For this purpose, the commercial business model should be reconsidered and adapted to the country-specific challenges and the portfolio should be aligned, taking into account possible marketing channels and prices of the respective country [22, 26]. It can thus be concluded that an expansion of the analyzed economic and political or governmental infrastructural factors would definitely have an impact on the pharmaceutical industry's performance.

The pharmaceutical industry should therefore cooperate even more closely with the national governments of the African developing countries and provide further funding for clinical research and market more products on the national sales markets so that the drug portfolio and treatment options for various diseases as well as the medical care of the national population can be expanded. The joint goal of governments and the pharmaceutical industry must be the strengthening of infrastructural factors with the distribution of affordable medicines to all sections of the population. This is the only way to permanently improve healthcare in these countries and expand it nationwide.

Implication for research

The gaps in the Global Health Observatory database used in this review, especially the lack of consistent annual data on different countries, should be addressed by ensuring that data are collected at necessary time periods in order to fully capture the trends in some parameters. This will ensure that there are no missing information required to enable comparison of yearly datasets, and that data from different years are representative of that time period.

REFERENCES

1. Development Bank of Southern Africa. How businesses are affected by a country's infrastructure. 2021. <https://www.dbsa.org/article/how-businesses-are-affected-countrys-infrastructure>. Accessed 11 Dec 2021.
2. Wu Q, Guan X, Zhang J, Xu Y. The Role of Rural Infrastructure in Reducing Production Costs and Promoting Resource-Conserving Agriculture. *International Journal of Environmental Research and Public Health* 2019; 16: 3493.
3. Eum NJ, Kim SH. A Cross-Country Comparative Study on the Role of Information and Communication Technology Policy and Infrastructure to Curb the Spread of Novel Coronavirus. *JMIR Public Health and Surveillance* 2021; Epub ahead of print.
4. Kruse C, Betancourt J, Ortiz S, Valdes Luna SM, Bamrah IK, Segovia N. Barriers to the Use of Mobile Health in Improving Health Outcomes in Developing Countries: Systematic Review. *Journal of Medical Internet Research* 2019; 21, 10: e13263.
5. Olanrewaju CC, Chitakira M, Olanrewaju OA, Louw E. Impacts of flood disasters in Nigeria: A critical evaluation of health implications and management. *Jamba – Journal of Disaster Risk Studies* 2019; 11, 1: 557.
6. Eze E, Gleasure R, Heavin C. Mobile health solutions in developing countries: a stakeholder perspective. *Health Systems* 2020; 9, 3: 179-201.

7. Kironji AG, Hodkinson P, Stewart de Ramirez S, Anest T, Wallis L, Razzak J, Jenson A, Hansoti B. Identifying barriers for out of hospital emergency care in low and low-middle income countries: a systematic review. *BMC Health Services Research* 2018; 18: 291.
8. Falchetta G, Hammad AT, Shayegh S. Planning universal accessibility to public
9. healthcare in sub-Saharan Africa. *PNAS - Proceedings of the National Academy of Sciences of the United States of America* 2020; 117, 50: 31760-31769.
10. Ekeigwe AA. Drug manufacturing and access to medicines: the West African story. A
11. literature review of challenges and proposed remediation. *AAPS Open* 2019; 5:3.
12. Conway M, Holt T, Sabow A, Yuan Sun I. Should sub-Saharan Africa make its own drugs? McKinsey & Company. 2019. <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/should-sub-saharan-africa-make-its-own-drugs>. Accessed 25 Jan 2021.
13. Ziegler A, Antes G, König IR. Preferred report items for systematic reviews and meta-analyses: the PRISMA statement [in German]. *Deutsche Medizinische Wochenschrift* 2011; 136: e9-e15.
14. African Health Observatory. World Health Organization – Regional Office for Africa. Health Situation Analysis in the African Region – Atlas of Health Statistics 2011. 2011. <http://www.who.int/en/atlas/atlas-african-health-statistics-2011>. Accessed 30 Jan 2021.
15. African Health Observatory. World Health Organization – Regional Office for Africa. Atlas of African Health Statistics 2016 – Health situation analysis of the African Region. 2016. <http://www.who.int/en/atlas/atlas-african-health-statistics-2016-health-situation-analysis-of-the-african-region>. Accessed 30 Jan 2021.
16. World Health Organization. The Global Health Observatory – World Health Data Platform. 2021. <https://www.who.int/data/gho/data/indicators/indicator-details/GHO>. Accessed 06 Feb 2021.
17. Holt T, Lahrichi M, Santos da Silva J. Africa: A continent of opportunity for pharma and patients. McKinsey & Company. 2015. <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/africa-a-continent-of-opportunity-for-pharma-and-patients>. Accessed 20 Jan 2021.
18. World Health Organization – Regional Office for Africa. WHO African Region Country Offices. 2017. <https://www.afro.who.int/countries>. Accessed 28 Jan 2021.
19. Aimée N: OECD. DAC List of ODA Recipients – Effective for reporting on 2018, 2019 and 2020 flows.
20. https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC_List_ODA_Recipients2018to2020_flows_En.pdf. Accessed 01 Apr 2021.
21. Salcedo J, McCormick K. *SPSS Statistics For Dummies* (4th Edition), John Wiley & Sons Inc. 2020. ISBN 978-1-119-56083-8.
22. Bland M. *An Introduction to Medical Statistics* (4th Edition). Oxford University Press 2000. ISBN 978-0-19-958992-0.
23. [Kollewe J. Big pharma ‘failing to develop urgent drugs for poorest countries’. *The Guardian*. 2018. <https://www.theguardian.com/business/2018/nov/20/big-pharma-who-failing-to-develop-urgent-drugs-for-poorest-countries>. Accessed 25 May 2021.
24. Gemeinsam für Afrika e.V.. Healthcare in African Countries 2016 [in German]. 2016. <https://www.gemeinsam-fuer-afrika.de/gesundheitsversorgung-in-den-laendern-afrikas/>. Accessed 12 Jun 2021.
25. Ascher J, Bogdan B, Dreszer J, Zhou G. Pharma’s next challenge. McKinsey & Company. 2015. <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/pharmas-next-challenge>. Accessed 02 Feb 2021.
26. Holt T, Millroy L, Mmopi M. Winning in Nigeria: Pharma’s next frontier. McKinsey & Company. 2017. <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/winning-in-nigeria-pharmas-next-frontier>. Accessed 31 Jan 2021.
27. Quick J, Boohene NA, Rankin J, Mbwasij RJ. Medicines supply in Africa – Should improve through regional collaborations and accredited drug shops. *BMJ* 2005; 331: 709-710.
28. den Boer M, Morgan R. Bad Pharma, Bad Karma: The Pharmaceutical Industry in Developing Countries. *EU-topias*. 2015. <http://eu-topias.org/en/bad-pharma-bad-karma-the-pharmaceutical-industry-in-developing-countries/>. Accessed 07 Jul 2021.
29. Agarwal A, Dreszer J, Mina J. What’s next for pharma in emerging markets? McKinsey & Company. 2017. <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/whats-next-for-pharma-in-emerging-markets>. Accessed 31 Jan 2021.

Acknowledgements

Authors would like to extend their heartfelt thanks to Professor Henry Silverman, University of Maryland Baltimore (UMB) for his initial review, suggestions and kind edits of the initial drafts of this paper. This paper has been accepted for the poster presentation at the Virtual Workshop on “Advancing Research Ethics in Asia and the Pacific” (17-18 November 2020) organized by the University of Maryland Baltimore, USA.

Conflict of interest: Nil

Medical Ethics in a Digital Era: A Systematic Review

Asima Mehaboob Khan¹, Rizwan Taj^{2*}, Aamir Naveed³, Abdul Wali⁴

¹Associate Clinical Psychologist, Psychiatry Department, Pakistan Institute of Medical Sciences Islamabad Pakistan Islamabad, Pakistan.

²Dean Federal Medical Teaching Institution, CEO Pakistan Institute of Medical Sciences, Chairperson Psychiatry Department, Pakistan Institute of Medical Sciences Islamabad, Pakistan.

³Postgraduate Psychiatry Trainee, Psychiatry Department Pakistan Institute of Medical Sciences Islamabad, Pakistan.

⁴Postgraduate Psychiatry Trainee, Psychiatry Department Pakistan Institute of Medical Sciences Islamabad, Pakistan.

Corresponding Author: Rizwan Taj

E-mail: rizwantajpims@gmail.com

ABSTRACT

Medical Ethics are codified or non-codified principles which are governing the norms of dealing patients. The digital era has revolutionized the field of medicine and raised diversified medical ethical concerns. The aim of granter systematic review analysis was to find out the ethical problems in the digital era regarding medicine and the mutual consensus and differences of the authors to solve them for a brighter future medicine. The PRISMA diagram methodology was adopted to complete the research article. The total 18 article were revised in systematic analysis. The methodological framework of the included research study these were qualitative case studies, interrogator reviews, thematic review literatures, mixed method analysis and multi-site studies involving the semi structured interviews. The analysis has concluded that the digital era is facing the numerous ethical concerns of privacy, transparency, credibility and medical legal responsibility of medical professionals. However, by solving this ethical concern the digital era contributes more effectively in medicine.

Keywords: Digital Era, Medical Ethics, Privacy, Transparency, Informed Consent

Introduction

The medical ethics are codified or non-codified norms and principles to preserve the autonomy, respect and dignity of the patients [1]. The principles of medical ethics based on respect to autonomy[2], beneficence [3], non-maleficence [4], respect to human rights [5], solidarity [6] and acceptance to ambiguity in medicine [7]. The medical ethics considers the humanitarian, regional, cultural, ethnic and religious principles. It gives importance to the informed consents, privacy and confidentiality of the patients [8]. The dynamic global circumstances bring rapid transition and advancement in medical ethics worldwide. The global transition of medical ethics ranges from Hippocratic Oath [9], the Nuremberg Code [10] and the Declaration of Helsinki [11] to the code of ethics adaptation by American Medical Association (1947) and the United Nation principle of medical ethics [12].

The digital era has brought the great revolution in the field of medicine [13]. The challenges and the professional responsibilities has also governed in digital era. The digital life has provided the artificial intelligence as the solution of challenge in healthcare sector. Morley et al., 2019 has

concluded that the artificial intelligence raises further challenges of ethical consideration, regulation and legal framework [14]. The ethical problems arise at six level such as individual, interpersonal, group, institutional, sectorial and societal level. These level of ethical challenges are classified as epistemic, normative and overarching [14].

In digital era, the use of artificial intelligence in medicine has provided wide variety of facilitation in prevention, diagnosis and management of diseases. The use of decision tree technique for diagnosis and treatment of Breast cancer is great contribution of artificial intelligence in domain of healthcare [15]. The supported vector machine technique classify human genes and diagnose diabetes mellitus [16]. The enable learning method is implemented to predict the outcomes of the cancer patients. The neural network technique is used to assess the human movement [16]. However, besides these contributions, the use of artificial intelligence has risen the challenges of privacy of the patients. It also raise questions of legal accountability of machines, mistaken decisions and unfair behaviour [14].

The pandemic outbreak of Covid-19 incorporated the use of digital access to the medical consultation in healthcare sector. The digital consultation provided the on screen opportunity for face to face consultation during pandemic [17]. It controlled many hazards of medical issues such as nosocomial infection, influx of OPDs, distraction of medical staff from over influx of emergencies and critical units by patient relatives and visitors [17]. However, it give rise to the several ethical consideration i.e. privacy of the patient's data, transparency of the medical procedure, legal accountability and authenticity of the practitioner [17].

The majority of The US population gain frequent access to the digital forums such as Facebook, tweeter, Instagram, email services and other social medical website in 2018. The digital access is being rapidly attained by developing countries as well [18]. These websites are offering the development of medical information resources and online consultation. The social media provides the collateral information and builds the patient doctor relationship. It provides the beneficial information to the patients and doctors in field of psychiatry [18].

Similarly, the coded medical ethics in digital era varies in different region however, there is a general conscience with human right charter of the united nation and world health organization. The constitution of Oman through article 332 of Royal Decree 7/2018 allows that the medical photo can be taken without the consent of individuals [19]. In contrary to it, the article 3 of human right commission prohibits and states that written inform consent must be taken from patient before any procedure. This article states the No one shall be subjected to torture or to inhuman or degrading treatment or punishment [5]. The dynamicity and transition of medical ethics in digital era remained the prime focus of scholars and researchers in recent years. A published systematic review literature qualitatively revised the literature published before 2018 [20]. The current research article is aimed at for systematic review of articles published on topic of medical ethics in digital era in period between 2019 and 2022.

Methodology

The current systematic review analysis was performed through Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement protocol [21].

Search Strategy

A digital computerized search library of articles in PubMed was created on 29 October, 2022 by using EndNote Version X9. The specific key words such as medical ethics and digital era were used to identify the articles. The additional articles were directly transported to the PubMed library through Google scholar. The Trials and Custom year range 2019 to 2022 was used to filter the articles.

Inclusion and Exclusion Criteria

The research studies were including in this systematic meta-analysis according to justified criteria. The research studies published on medical ethics during 2019 to 2022 were included in this analysis. The research design of included research studies were qualitative research design, case report, interrogative review and thematic literature review. The research studies related to medical

ethics in relation to contribution of any digital forum or modality were retained in qualitative assessment of analysis. All the research studies published before 2019 on topic of medical ethics in digital era were excluded from current systematic meta-analysis literature review because of previous evidence of publication [20, 22]. The articles related to medical ethics other than the concern of digital age were also excluded from current literature review.

Table 1: Inclusion and Exclusion Criteria of Systematic Literature Review

Criteria	Inclusion	Exclusion
Topic, Keyword	Medical Ethics, Digital Era	Other than medical ethics and digital era
Research Design	Qualitative Research Design, Case Report, Interrogative Review and Thematic Literature Review	Quantitative Analysis, Cohort Studies
Year of Publication	2019 to 2022	Before 2019
Language	English	Other than English

Reviewing Process

Through use of specific keywords (medical ethics & digital era) articles were searched in PubMed library of EndNote Version X9. Firstly, the articles were filtered based on year of publication and all published material before 2019 was removed from digital PubMed library. After that, the articles were revised on title base and duplication of the articles was removed. The full text articles, free to access in English language were downloaded and included in qualitative analysis.

Data Extraction and Assessment of Risk of Bias

The data was extracted based on author and publication year, title of the article, followed research design, adopted cored digital technology for discussion, outcomes and limitation. The quality of included studies was assessed and risk of bias was limited by using thematic analysis [23].

Results

Initially 362 articles were identified by using online library of PubMed in EndNote X9 software. There were 25 articles downloaded through other medium such as Google scholar. The total 387 articles published during period of 2019 to 2022 on topic of medical ethics in digital era were identified. After removing duplication according to defined criteria given above. Furthermore, 49 articles were removed based on language issues, free accessibility problems and research design deviations from the inclusion criteria of current systematic review literature and 18 were subjected to evaluate for further analysis. These 18 articles were downloaded and revised for full text to include in qualitative systematic meta-analysis of literature review. The screening of literature did not show the scientific research contribution from Pakistani scholars on concerned domain in defined time frame and according to selection criteria of studies. Therefore, in these 18 articles, there was no publication from Pakistan.

Author Name	Title	Study Design	Conclusion	Limitations
Al Balushi, 2019	The Ethics and Legality of Using Personal Smartphones to take Medical Photographs	Qualitative, Case Study	The use of personal smartphone for medical photography is easy and faster procedure for medical record. However, it raises the ethical issues	Case study (limited number of observations) No statistical analysis of the observation.

			of patient confidentiality and privacy. Only hospital equipment should be used.	
Chang, Shi, & Zhang, 2019	The contemporary ethical and privacy issues of smart medical fields. International Journal of Strategic Engineering	Qualitative, Case Study	Electronic healthcare record is best maintained by digital devices. Ethical issues such as privacy and security of medical record.	-Case report with limited number of observational data for qualitative analysis.
Han et al., 2019	Medical education trends for future physicians in the era of advanced technology and artificial intelligence: an integrative review	Interrogative Review	Digital platforms facilitate to develop and bring advancement in the medical curricula. Provides data management and assent facilities.	
Keskinbora, 2019	Medical ethics considerations on artificial intelligence.	Qualitative Analysis	Artificial Intelligence algorithms can cause unforeseen consequences and unfair outcomes. However, the researcher and ethicists ensured more secure and positive future in prospective of medical field.	
Morley et al., 2019	The debate on the ethics of AI in health care: a reconstruction and critical review	Thematic Literature Review	Revised literature concluded that the algorithm of artificial intelligence revolutionaries the healthcare sectors and raised the serious ethical concerns. However, future is safer and secure with AI by mitigating the ethical problems.	Search parameters to identify the articles were variant throughout the review. Database was not operated with same syntax.
Nebeker, Torous, & Bartlett Ellis, 2019	Building the case for actionable ethics in digital	Mixed method analysis	Research studies should be conducted to	

	health research supported by artificial intelligence		identify the necessary ethical concerns regarding use of artificial intelligence in healthcare sector.	
Terrasse, Gorin, & Sisti, 2019	Social Media, E-Health, and Medical Ethics	Qualitative Research Design	Social media platforms i.e. Facebook, Instagram, Websites and YouTube are the main resource for medical awareness. They are offering the online face to face consultations. The ethical concerns of privacy and norm of written informed consents are necessary for sharing information of patients.	
Varghese et al., 2019	Ethical standards for cardiothoracic surgeons' participation in social media	Qualitative Research Design	Cardiothoracic Surgeon should maintain the privacy and confidentiality of the patients while sharing the information on social media. Shared information will be considered permanent. Personal and professional boundaries should be maintained.	
Wangmo, Lipps, Kressig, & Ienca, 2019	Ethical concerns with the use of intelligent assistive technology: findings from a qualitative study with professional stakeholders	Multi-site study involving semi structured interview	The study concluded the outcome as multifaceted spectrum of ethical concerns. The stakeholders and end consumers should have promise to	

			maintain professional boundaries.	
Chew & Ko, 2020	Medical ethics in the era of COVID-19: Now and the future			
Curkovic, Kosec, & Curkovic, 2020	Medical professionalism in times of COVID-19 pandemic: is economic logic trumping medical ethics?			
Gasser, Ienca, Scheibner, Sleigh, & Vayena, 2020	Digital tools against COVID-19: taxonomy, ethical challenges, and navigation aid.			
Masters, 2020	Ethics in medical education digital scholarship			
Dugdale & Braswell, 2021	The ethics of leveraging medical student status on social media			
Wong et al., 2021	Harnessing the digital potential of the next generation of health professionals			
Erler et al., 2022	Clinical Ethics Consultation During the First COVID-19 Pandemic Surge at an Academic Medical Center: A Mixed Methods Analysis			
Lettieri et al., 2022	Medical confidentiality in the digital era: an analysis of physician-patient relations			
Pasricha, 2022	Ethics for Digital Medicine: A Path for Ethical Emerging Medical IoT Design			

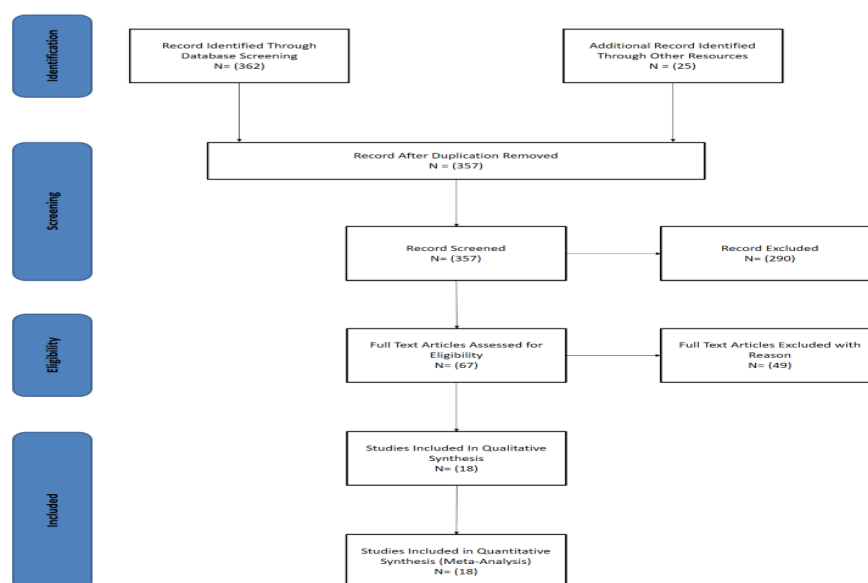


Figure 1: PRISMA Diagram

Discussion

The health care sectors facing a number of challenges in growing era of technology. The digital life has provided the artificial intelligence as the solution of challenge in healthcare sector. Morley et al., 2019 has concluded the the artificial intelligence provide raise further challenges of ethical consideration, regulation and legal framework [14]. The ethical problems arise at six level such as individual, interpersonal, group, institutional, sectoral and societal level. These level of ethical challenges are categorised as epistemic, normative and overarching.

In digital era, the use of artificial intelligence in medicine has provided wide variety of facilitation in prevention, diagnosis and management of diseases. The use of decision tree technique for diagnosis and treatment of breast cancer is great contribution of artificial intelligence in domain of healthcare [14]. The supported vector machine technique classify human genes and diagnose diabetes mellitus. The ensemble learning method is implemented to predict the outcomes of the cancer patients. The neural network technique is used to assess the human movement.

However, besides these contributions, the use of artificial intelligence has risen the challenges of privacy of the patients. It also raises questions of legal accountability of machines, mistaken decisions and unfair behaviour.

The pandemic outbreak of Covid-19 incorporated the use of digital access to the medical consultation in healthcare sector. The digital consultation provided the on screen opportunity for face to face consultation during pandemic [17]. It controlled many hazards of medical maneuver such as nosocomial infection, influx of OPDs, distraction of medical staff from over influx of emergencies and critical units by patient relatives and visitors. However, it give rise to the several ethical consideration i.e. privacy of the patient's data, transparency of the medical procedure, legal accountability and authenticity of the practitioner [17].

The majority of The US population gain frequent access to the digital forums such as Facebook, twitter, Instagram, email services and other social medical website in 2018. The digital access is being rapidly attained by developing countries as well. These websites are offering the development of medical information resources and online consultation. The social media provides the collateral information and builds the patient doctor relationship. It provides the beneficial information to the patients and doctors in field of psychiatry [18]. While using the telemedicine, the doctors have to ethical consideration and the therapeutic chain protocol. The medical staff must have to take the

information consent from patients and their family member before publishing such those information for academic purpose [18]. The critics of the telemedicine argue that the field of medicine is need physical interaction of patient and doctor for effective diagnosis. Therefore, the diagnosis made through telemedicine is ineffective and causes the more damage to the patients.

Conclusion

The digital era has made various facilitation for the modern treatment of diseases. It has also provided various digital access to the doctors and medical resources. The digital era, along these facilities has risen the issues of ethical concern of privacy, transparency, credibility and medico-legal responsibility. However, the future of medicines with digitalized era is brighter by solving these ethical issues.

REFERENCES

1. Wong, M.K., et al., A systematic scoping review of undergraduate medical ethics education programs from 1990 to 2020. 2022. 44(2): p. 167-186.
2. Kolmes, S., C. Ha, and J. Potter. Responding to Cultural Limitations on Patient Autonomy: A Clinical Ethics Case Study. in HEC Forum. 2022. Springer.
3. Hostiuc, S., et al., From Monastic Benevolence to Medical Beneficence: The Inception of Medical Ethics in Wallachia and Moldavia before the Second Half of the 19th Century. 2022. 19(16): p. 10229.
4. O'Donoghue, K.J.J.o.A.E., Learning Analytics within Higher Education: Autonomy, Beneficence and Non-maleficence. 2022: p. 1-13.
5. Lighthart, S., et al., Is virtually everything possible? The relevance of ethics and human rights for introducing extended reality in forensic psychiatry. 2022. 13(3): p. 144-157.
6. Yeh, M.-J.J.A.J.o.P.H., Solidarity in Pandemics, Mandatory Vaccination, and Public Health Ethics. 2022. 112(2): p. 255-261.
7. Liu, D., et al., The neural basis of acceptance of uncertain situations: Relationship between ambiguity tolerance and the resting-state functional connectivity of the brain. 2022: p. 1-9.
8. Parsa-Parsi, R.W.J.J., The International Code of Medical Ethics of the World Medical Association. 2022.
9. Askitopoulou, H. and A.N.J.E.S.J. Vgontzas, The relevance of the Hippocratic Oath to the ethical and moral values of contemporary medicine. Part II: interpretation of the Hippocratic Oath—today's perspective. 2018. 27(7): p. 1491-1500.
10. Moreno, J.D.J.J.C.H.L. and Pol'y, Reassessing the influence of the Nuremberg Code on American medical ethics. 1996. 13: p. 347.
11. PP, R.J.B.m.j., Human experimentation. Code of ethics of the world medical association. Declaration of Helsinki. 1964. 2(5402): p. 177-177.
12. Guenter, D., J. Esparza, and R.J.J.o.m.e. Macklin, Ethical considerations in international HIV vaccine trials: summary of a consultative process conducted by the Joint United Nations Programme on HIV/AIDS (UNAIDS). 2000. 26(1): p. 37-43.
13. Chandra, M., et al., Digital technologies, healthcare and Covid-19: insights from developing and emerging nations. 2022: p. 1-22.
14. Morley, J., et al., The debate on the ethics of AI in health care: a reconstruction and critical review. 2019.
15. Nebeker, C., J. Torous, and R.J.J.B.m. Bartlett Ellis, Building the case for actionable ethics in digital health research supported by artificial intelligence. 2019. 17(1): p. 1-7.
16. Barton, C., et al., Evaluation of a machine learning algorithm for up to 48-hour advance prediction of sepsis using six vital signs. 2019. 109: p. 79-84.
17. Chew, C. and D.J.R. Ko, Medical ethics in the era of COVID-19: Now and the future. 2020. 25(10): p. 1033.
18. Terrasse, M., M. Gorin, and D.J.H.C.R. Sisti, Social media, e-health, and medical ethics. 2019. 49(1): p. 24-33.
19. Dugdale, L. and H.J.A.M. Braswell, Instacash: The ethics of leveraging medical student status on social media. 2021. 96(4): p. 507-511.
20. Ienca, M., et al., Ethical design of intelligent assistive technologies for dementia: a descriptive review. 2018. 24(4): p. 1035-1055.
21. Haddaway, N.R., et al., PRISMA2020: An R package and Shiny app for producing PRISMA 2020-

- compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. 2022. 18(2): p. e1230.
22. Ienca, M., et al., Intelligent assistive technology for Alzheimer's disease and other dementias: a systematic review. 2017. 56(4): p. 1301-1340.
 23. Kitchen, C., et al., Status and Impacts of Recreational and Medicinal Cannabis Policies in Africa: A Systematic Review and Thematic Analysis of Published and "Gray" Literature. 2022.

Acknowledgements: Nil

Conflict of interest: Nil

Funding: Nil

Original Research Paper

A Cross-Sectional Study on the Perception of Faculty on Online Medical Teaching during the Three Waves of COVID-19 in a Teaching Hospital in North-Eastern India

Daunipaia Slong¹, Anamika Nath², Amar Jyoti Patowary³,
Amarantha Donna Ropmay⁴, Ankith Rao Jonpelly⁵, Shankar Kishnath⁶, Prabal Das⁷,
Dev Ashis Ramu Damu⁸, Amitav Sarma⁹, Bhupen Barman¹⁰,
Himashree Bhattacharyya¹¹, Polina Baruah¹²

¹Associate Professor, Department of Forensic Medicine, North-Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, India.

²Demonstrator, Department of Forensic Medicine & Toxicology, Tezpur Medical College & Hospital, Assam, India.

³Professor and Head, Department of Forensic Medicine, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, India.

⁴Additional Professor, Department of Forensic Medicine, NEIGRIHMS, Shillong.

^{5,6,7}Post Graduate Trainee, Department of Forensic Medicine, NEIGRIHMS, Shillong.

⁸Assistant Professor, Department of Forensic Medicine, Sikkim Manipal Institute of Medical Sciences, Sikkim.

⁹Additional Professor, Department of Anatomy, NEIGRIHMS, Shillong.

¹⁰Additional Professor, Department of General Medicine, NEIGRIHMS, Shillong.

¹¹Associate Professor, Department of Community and Family Medicine, All India Institute of Medical Sciences, Guwahati.

¹²Assistant Professor, Department of Biochemistry, NEIGRIHMS, Shillong.

Corresponding Author: A. D. Ropmay

E-mail: donnaropmay@gmail.com

ABSTRACT

Background: Medical education has undergone drastic changes from conventional face-to-face to online classes during the three phases of the pandemic. However, not many studies reflected the teacher's perspective. Therefore, this study is aimed at assessing the perception of medical teachers toward online teaching during the COVID-19 pandemic.

Methodology: It was a cross-sectional questionnaire-based study containing the demographic description of the participants and the perception of the participants towards online teaching. Likert's scale for rating the answers was used for grading from one to five. These responses were entered into Microsoft Excel 2007 and analyzed accordingly. The data was expressed in frequencies and percentages.

Results: Out of 47 participants having a mean age of 35.26 years and a mean teaching age of 6.5 years, Google Meet was the most utilized platform. 85.10% were accustomed to the devices used and 76.59% to the software. 76.59% felt the interaction with students was difficult. 57.45% of them opined that students were not attentive and 81% felt difficulty in monitoring the students. 51.06% of the teachers felt distracted during the classes. 38.30% and 6% felt online classes were as good as physical classes in dispersing theoretical and practical knowledge, respectively.

Conclusion: The teachers were comfortable with teaching via an online platform and were accustomed to the technology. However, they felt that physical or face-to-face classes were better in comparison to online classes.

Key Words: Online classes, medical faculty, perception, COVID-19, Google Meet, distraction, physical class.

Introduction

The COVID-19 pandemic has caused great disruption which affects individuals from every walk of life. During the pandemic, medical education has also undergone drastic changes where the teaching and learning methods move from conventional face-to-face or physical classes to online classes. Online learning can be defined as the use of electronic technology and media to deliver, support, and enhance both learning and teaching and involves communication between learners and teachers who are utilizing online content [1].

Online teaching has its merit and demerit. Its advantages include flexibility and convenience for students and teachers, reproducibility of the learning resources, and learners' can progress at their preferred pace [2]. The common disadvantages are the missing of face-to-face interactions, eye contact, personal attention, difficulty to retain engagement, difficulty to teach a certain skill like communication, etc [3,4].

Although many studies have been conducted on the perception of online teaching these were mostly carried out on students and the teacher's perspective was not taken into consideration [5,6]. Therefore, this study aimed at assessing the perception of medical teachers towards online teaching during the COVID-19 pandemic.

Methodology

This cross-sectional study was conducted at a tertiary care medical institute. Medical teachers comprising faculty and residents, who gave consent for this study and were actively involved in online teaching, were included as study participants. The participants were provided with a questionnaire that consisted of two parts. The first part contained the demographic description of the participants and the second part contained 11 questions related to the perception of the participants towards online teaching. Likert's scale was utilized for rating the answers from I – 5 where 1 – Strongly agree, 2 – Agree, 3 – Neutral, 4 – Disagree, and 5 – Strongly disagree [7]. Responses were entered in Microsoft Excel 2007 and subjected to descriptive analysis. The data were expressed in frequencies and percentages. Approval for the project was obtained from the Institutional Ethics Committee (IEC) on 28th December 2020.

Results

There were 47 teachers who participated in this study and their mean age was 35.26 years. Their teaching experiences range from 1 to 24 yrs with a mean of 6.5 years. The electronic device used by teachers to conduct online classes includes desktop, laptop, tablet, and mobile phones. Among the various online platforms available, Google meet was utilised the most by the teachers followed by Zoom. The demographic description of the teachers including the devices and software used are shown in Table 1.

Table 1: Socio-demographic profile of participants (n=47)

Age (In Years)	Mean $\pm$ SD	35.2 $\pm$ 7.9
	Range	27 (26-53)
Teaching Experience	Mean $\pm$ SD	6.59 $\pm$ 6
	Range	23 (1-24)
Device Used	Type	n (%), N= 40
	Desktop	18 (38.30%)
	Laptop	13 (27.66%)
	Mobile/Tablet	3 (6.38%)

	Multiple	6 (12.77%)
Software Used	Type	n (%) N= 35
	Google Meet	11 (23.40%)
	Zoom	9 (19.15%)
	TrueConf	5 (10.64%)
	Multiple	10 (21.28%)

It was observed that a majority of the teachers (72.34%) were comfortable with online teaching as depicted in Table 2.

Table 2: Perception of teachers towards Online Classes (n=47)

Q No	Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I am comfortable with online class	4 (8.51%)	30 (63.83%)	5 (10.64%)	5 (10.64%)	3 (6.38%)
2	Internet connectivity is good	12 (25.53%)	21 (44.68%)	5 (10.64%)	9 (19.15%)	0
3	Students are attentive during the class	0	4 (8.51%)	16 (34.04%)	21 (44.68%)	6 (12.77%)
4	There is no distracting agent during online class	3 (6.38%)	14 (29.79%)	6 (12.77%)	17 (36.17%)	7 (14.89%)
5	I am accustomed to the smart devices I am using for an online class	11 (23.40%)	29 (61.70%)	2 (4.26%)	5 (10.64%)	0
6	I am aware of the features of the software used	8 (17.02%)	28 (59.57%)	7 (14.89%)	3 (6.38%)	1 (2.13%)
7	My time management for the online class is as good as a physical class	8 (17.02%)	23 (48.94%)	5 (10.64%)	9 (19.15%)	2 (4.26%)
8	Interaction with students during online classes is as good as a physical class	0	4 (8.51%)	7 (14.89%)	21 (44.68%)	15 (31.91%)
9	I can monitor all the students present during the class	1 (2.13%)	2 (4.26%)	6 (12.77%)	22 (46.81%)	16 (34.04%)
10	Online classes are as good as physical classes for disseminating theoretical knowledge	0	18 (38.30%)	8 (17.02%)	16 (34.04%)	5 (10.64%)
11	Online classes are as good as physical classes for disseminating practical knowledge	0	0	2 (4.26%)	24 (51.06%)	21 (44.68%)

An uninterrupted internet connection plays a vital role in the smooth conduct of any online class. In this study, 70.21% of the teachers found that internet connectivity was good. In addition, many of them were accustomed to the device (85.10%) and the software (76.59%) used for online classes. One of the most important parts of any teaching-learning process is teacher-student interaction but 76.59% of the teachers felt that this was difficult during online classes. Student attentiveness is another factor that received an unfavourable response from the teachers with 57.45% of them opining that students were not attentive during an online class. Moreover, nearly 81% of the teachers felt that monitoring the students during these classes was difficult. While 51.06% of the teachers expressed being distracted during classes, 36.17% felt the contrary.

Regarding teaching theoretical knowledge, 38.30% of the teachers agreed that online classes were as good as physical classes while 44.68% felt that physical classes were better. However, when it comes to teaching the psychomotor domain, more than 94% of them believed that physical class was better. Time management was another factor that was compared between online and physical classes. In this aspect, more than 65% of the teachers agreed that online classes were as good as physical classes.

Discussion

The pandemic, since it started, has brought changes to every sphere of life. Medical education has also been affected by it whereby the processes of teaching and learning medicine are being carried out through the online platform in place of the conventional classroom atmosphere. However, a majority of the teachers in our study have been able to adapt to and remained unaffected by this change with more than 72% of them responding of being comfortable with online teaching. For those who encounter problems during online teaching, regular training programs on E-learning may help overcome this issue. The finding was also reported by a previous study in which only 10.19% of faculty were uncomfortable with online teaching [3].

Regarding the familiarity of the teachers with the technology involved in taking online classes, many of them were accustomed to the devices and features of the software used for this purpose; a finding similarly observed by other studies [8,9]. This positive response by the teachers could be due to the participants being more from the younger age group who are more aware of the advancement in modern technology. Internet connectivity is not a problem for many of the teachers in this study even though it has been cited earlier as one of the many barriers to carrying out effective online teaching [10]. This may be attributed to the fact that the classes were taken from designated areas overseen by the staff under the Telemedicine department of the Institute. Factors like student attentiveness and student monitoring have received unfavourable responses where the majority of the teachers found it difficult to monitor the students during online classes. This is a concern also shared by the previous study [11]. Some of the teachers in our study also reported being distracted while taking online classes, for example students making annotations on screen, a finding also noted by 45.2% of the participants in a study by Vishwanathan K et al [12]. This distraction can be minimized through a proper and thorough understanding of the online platform used where the host (teacher) exercises control such as muting all the students and disabling specific applications during the class. The students should also be advised to log in for the class on time as lack of punctuality is also another important factor that may lead to the teacher being distracted during online classes. Another factor that received an unfavourable response from the teachers in our study was the interaction with the students where a majority of them preferred physical classes to online classes; a finding similar to Motte-Signoret E et al [13]. However, Joshi KP et al found that 44% of faculty were satisfied with the student-faculty interaction during online classes [8].

In this study, an effort was also made to compare the effectiveness of disseminating theoretical and practical knowledge between online and physical classes. As far as imparting theoretical knowledge and psychomotor domains are concerned, the teachers felt that online classes are as good as physical classes for disseminating theoretical knowledge but almost all of them thought that physical classes are much better than online classes for teaching psychomotor domain. Similarly, previous studies have supported this finding where the teachers found it difficult to teach skill domains during online classes [3,8,14].

Conclusion

The teachers were comfortable with teaching via an online platform and were accustomed to the technology to conduct online classes. However, they thought that the students were not attentive and found it difficult to monitor them during the classes. As far as teaching the psychomotor domain and interaction with the students were concerned, it was felt that physical or face-to-face classes were better in comparison to online classes. The pandemic has taught an important lesson that it is necessary for medical teachers of today to equip themselves with e-learning skills and

knowledge to tide over the challenging waves that cross their path in their quest for educational excellence.

References

1. Howlett D, Vincent T, Gainsborough N, Fairclough J, Taylor N, Vincent R.
2. Integration of a case-based online module into an undergraduate curriculum: What is involved and what is effective? *E-Learning* 2009;6(4):372-84.
3. Greenhalgh T. Computer-assisted learning in undergraduate medical education. *BMJ* 2001;322(7277):40-4.
4. Kapoor A, Kapoor A, Charokar K, Mishra A, Motagi MV, Sadawarte SK. A Faculty survey about online teaching during early lockdown period of the COVID-19 pandemic in a medical college in central India. *Chrimed J Health Res* 2020;7(4):265-70.
5. Torda A. How COVID-19 has pushed us into a medical education revolution. *Internal medicine journal*. 2020 Sep;50(9):1150-3.
6. Bączek M, Zagańczyk-Bączek M, Szpringer M, Jaroszyński A, Woźakowska-Kapł on B. Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students. *Medicine*. 2021;100(7):e24821.
7. Menon UK, Gopalakrishnan S, Ramachandran R, Baby P, Sasidharan A, Radhakrishnan N. Perceptions of undergraduate medical students regarding institutional online teaching-learning programme. *Medical Journal Armed Forces India*. 2021;77(Suppl 1):S227-33.
8. Likert R. A technique for the measurement of attitudes. *Archives of Psychology*. 1932;22:5–55.
9. Joshi KP, Jamadar D, Dixit R. Perception of faculty toward online teaching and learning in the undergraduate medical students during coronavirus disease-19 pandemic. *Int J Med Sci Public Health*. 2020;9(8):484-7.
10. Khanom M, Hoque A, Iqbal Sharif MP, Sabuj M, Hossain A. Online classes in undergraduate medical teaching: recommendations from perspectives of teachers and students in a non-government medical college of Bangladesh *Northwestern Med J*. 2022;2(3):177-181.
11. O'Doherty D, Dromey M, Loughheed J, Hannigan A, Last J, McGrath D. Barriers and solutions to online learning in medical education – an integrative review. *BMC Med Educ*. 2018;18(1):130.
12. Menon P, Pande V, Jadhav S, Agarkhedkar S. Perception of faculty and students about E-learning – its feasibility, acceptance, and implementation in COVID pandemic crisis. *J Mar Med Soc [serial online]* 2021 [cited 2022 Dec 6];23:167-70.
13. Vishwanathan K, Patel GM, Patel DJ. Medical faculty perception toward digital teaching methods during COVID-19 pandemic: Experience from India. *J Edu Health Promot*. 2021;10:95.
14. Motte-Signoret E, Labbé A, Benoist G, Linglart A, Gajdos V, Lapillonne A. Perception of medical education by learners and teachers during the COVID-19 pandemic: a cross-sectional survey of online teaching. *Medical education online*. 2021;26(1):1919042.
15. Gupta M, Singh M, Gupta R, Sobti S, Gupta P, Gupta V, et al. The perception of the medical faculty and undergraduate students regarding online teaching in the era of COVID-19. *Int J Acad Med* 2021;7(3):156-65.

Acknowledgements: Nil

Conflict of interest: Nil

Funding: Nil

Original Research Paper

Knowledge, Attitude And Practice Among The Medical And Dental Undergraduates Regarding On Whole Body Donation For Teaching Learning Purposes: A Perspectives From Bioethics- A Cross Sectional Study

Koirala S¹, Shah S², Shakya DR³, Rijal A⁴, Rimal J⁵, Khanal L⁶, Baral DD⁷

¹Additional Professor, Department of Human Anatomy, B.P. Koirala Institute of Health Sciences, Nepal

²Department of Human Anatomy, Member of UNESCO Bioethics Nepal Unit

³Department of Psychiatry and Head of UNESCO Bioethics, Nepal Unit

⁴Department of Dermatology and Venereology, Member of UNESCO Bioethics Nepal Unit

⁵Department of Oral Medicine and Radiology & Coordinator of Health Profession Education

⁶School of Public Health and Community Medicine.

⁷B.P. Koirala Institute of Health Sciences, Nepal

Corresponding Author: Sarun Koirala

E-mail: sarun.koirala@bpkihs.edu

ABSTRACT

Background: Cadaveric dissection provides as for student to learn the detailed structure of human anatomy; thus, body donation program is pertinent in ensuring the continuation of dissection class. The objectives of this study were to assess the student knowledge, attitude, practice on body donation and to validate the questionnaire that assesses knowledge, attitude and practice during dissection.

Methodology: A cross sectional study was conducted on 264 undergraduates medical and dental students in B.P. Koirala Institute of Health Sciences, Nepal, who had attended regular dissection classes for one year. Ethical approval was obtained from Institutional Review Committee-IRC/1455/018. A non-probability purposive sampling technique was applied to sample the study subjects. A questionnaire consisting of 32 items was distributed to the students on day-1 and day-15 of intervention and the data was analyzed using Paired 't' test. A bivariate correlation was done for intra class correlation of each domain and Cronbach's alpha was calculated for each domain.

Results: Religion, lack of awareness program, insecurity of being mishandled were found to be main barriers which discouraged for body donation in future. 98 % student claimed that the dissected body needs to be handled respectfully to maintain the dignity of person after death. Attitude and practice were positively correlated ($r = 0.17$, $p < 0.01$). Factors affecting practice and attitude were significant ($p < 0.05$) and positively correlated ($r = 0.814$). There was significant relation between knowledge, attitude and practice ($p = 0.018$, 0.004 , 0.000) at 95 % C.I. The intra class correlation scores of each domain during test and retest were 0.83, 0.72, 0.60 and correlated significantly ($p < 0.05$). The questionnaire designed was reliable for knowledge, attitude, practice domain with Cronbach's alpha of 0.68, 0.70, and 0.60 respectively.

Conclusion: Overall knowledge, attitude and practice on body donation was acceptable among the students involved in this study. A validated questionnaire was developed which can be used to collect the opinion on whole body donation for academic purposes.

Keywords: body donation, knowledge, attitude, practices, undergraduate medical students

Introduction

Dead body donation is useful for medical education and in research which is beneficial for needs of living persons. Cadavers remain principal tool for medical education and anatomists, without the dissection of human body, learning of anatomy are incomplete. For depth knowledge of human organs dissection is important [1]. For collection of dead bodies for teaching purposes there is Bombay Anatomy Act in India, an Act to provide for supply of unclaimed dead bodies of deceased persons and for donation before death by a person of his body or any part, after his death to hospitals and medical and teaching institutions for therapeutic proposes or for medical education and research including anatomical examination and dissections [2]. The right to a decent burial is the most basic right of any human being, as cadaver remains deprived of this right for the benefit of our medical students and future care takers of health which helps to preserve life science even in death and is a symbol of generosity at its zenith deserving our extreme gratitude and reverence. The immense courage needed to give away the body of a loved one for dissection must be acknowledged and respected by all [3]. When dealing with the dead, the margin between ethical and unethical is hair lined and fragile. It is very important to define the boundary between meaningful, judicious use, commercial exploitation and ravenous abuse. The purposes should be noble and ethically justified if we were to use; as a mere tool; another person who once that full life legend behind him. Faculties, students and *care providers (who take care and handle cadavers)* motive should be clear and so to maintain the human nature towards cadavers when we get involved during dissection [4]. As pointed out by many anatomists worldwide, an international debate on body donation and the use of the dissection of human cadavers in healthcare studies is needed. Numerous countries have no donation programs in place, or difficulties in obtaining bodies for anatomy teaching [5]. The numbers of medical colleges are increasing for health care of the society and increase in demand of cadavers for teaching learning activities. So there is scarcity of the dead bodies for dissection and research by medical students. It is very difficult to emphasis and promote people in society on whole body donation for academic purposes [6-7].

Cadaveric crisis faced by many medical institutions can be resolved through increased awareness and proactive community involvement. Cadaver donation, if done in an ethically morally and legally justified manner, can help to preserve our cadaver heritage as the essence of medical anatomy studies and clinical therapeutics [5,8]. Hence this research was focused on various factors e.g. social, cultural aspects and religious rituals which may act as barrier to whole body donation and also on ethical issues an aspect regarding whole body donation, attitude, practice during dissection to maintain dignity and goodwill even after death of a person. Also, this may raise awareness to initiate to plan for the whole-body donation after death for teaching learning purposes in a medical institute.

Objectives

1. To know knowledge, attitude, practice of whole-body donation for academic purposes and
2. To identify barriers for whole body donation for academic purposes, validate the questionnaire prepared for our context.

Research Design and Methodology

A quantitative, cross-sectional research was conducted among the undergraduate students of MBBS and BDS in BPKIHS who had undergone through dissection during their 1st year and 2nd year preclinical courses. Non-probability (purposive) sampling technique was applied for sampling method. Predictor baseline variables were Incentives for donating body, Known relatives who had already donated body and *Section 3 of Libel and Slander Act 2016*. The outcome variables were e.g. increase in interest/ willingness to donate whole body for academic purposes and barriers to whole body donation for academic purpose. The ethical approval was obtained from IRC, B.P. Koirala Institute of Health Sciences, Nepal IRC- 1455-018.

Calculation of Sample size

This study considered 95% of CI, and 80% of power, to estimate the sample size. For this purpose, we considered 30 % prevalence in practice from various study done in different years [7-8].

Sample size, $n = z^2pq / d^2$

Where,

n = number of sample to be calculated

value of $z = 1.96$ at when 95% CI is considered, so ($z = 1.96$ which is ≈ 2 , $z^2 = 4$)

p = prevalence 30 %, taken from prevalence in practice from above mentioned studies,

hence, $q = (100 - 30) = 70$ %

$d = (20\% \text{ of } p)$, i.e. = 20 % of 30 (prevalence) = 6

$d = 6$ at 80 % power of study

so $d^2 = 36$

putting all values in above equation then, $n = z^2pq / d^2 = 4 * 30 * 70 / 36 = 240$.

10 % was added in calculated size to reduce the various sample bias = 24. Total required sample size was, $n = 240 + 24 = 264$

Criteria for Sample Selection

Those undergraduate students of BPKIHS who had done dissection during their regular LABEX session and those who voluntarily gave their consent was included and be a part of study were included for this purpose.

Data Collection Technique / Methods :

Questionnaire was distributed among to the 3rd and 2nd year MBBS (200- students), BDS (120- students) who had done dissection during their labex session and those who wished to give a consent to participate and be the part of study. The purpose of the study and procedure was explained and written informed consent was obtained. The participant was informed that their participation was voluntary. The data collection tools was a multipart questionnaire with 11 knowledge, 8 attitude and 13 practice questions towards whole body donation for teaching learning [10]. They were assured that their responses was confidence and anonymity was maintained by coding. The questionnaire was developed by process including the item generation, item reduction, item scaling and pretesting. The data collection tools was a multipart questionnaire which

Pre-testing the Data Collection Tools:

Pre-testing of data collection tools was done in 10 % of participant and was kept confidential. contained 11 knowledge, 8 attitude and 13 practice domain questions. The scale had different values rating from 1-3 were used for knowledge assessing, where 1= yes, 2= no, 3= don't know. To, assess the attitude, scale with values ranging from, 1-5 is used, where 1= strongly disagree, 2= disagree, 3= No, 4= agree, 5= strongly agree. To, assess the practice, scale with values rating, 0-1 is used, where 0 = Yes, 1= No

Face and content Validity:

Face validity was confirmed by the expert committee consisting of three anatomist, one lawyer practicing in medical issues in court and member of IRC, and one Head of Nepal National Unit UNESCO bioethics who himself was a psychiatrist, one from Health Professions Education, one statistician and two steering members of UNESCO bioethics Nepal Unit, BPKIHS. They reviewed the questionnaire added and deleted item, scaling of item in the tools. Further the review of literature was done to confirm the face validity.

Test- retests reliability:

The questionnaire was distributed among the target population on day 0 and again after 15 days, the same questionnaire was distributed and the test- retest reliability coefficient was calculated.

The Cronbach's alpha was calculated and the intra class correlation coefficient was calculated for each questions [11]. Validity and Reliability of the Research The Cronbach's alpha was calculated for our local context and those were later on included in the sample size and the intra class correlation coefficient was calculated for each questions [12].

Data handling

First master was prepared and collected data was entered in Microsoft Excel 2010 and converted into Statistical Package for Social Sciences- SPSS 11.5 version for analysis. For descriptive statistics: Percentage, proportion, mean with standard deviation (SD) was calculated. For inferential statistics: Chi square test, Pearson correlation test, t-test was applied. Correlation analysis was performed to assess association between knowledge, attitude, practice and barriers. Logistic regression analysis was performed to find the predictors of knowledge, attitude, practice and barriers for whole body donation for the medical education purposes.

Results

Religion, lack of awareness program, insecurity of being mishandled was found to be main barriers which discouraged for the body donation in future. 98 % student claimed that the dissected body needs to be handled respectfully to maintain the dignity of person after death (Figure 3&4). Attitude and practice was positively correlated ($r = 0.17$, $p < 0.01$) (Table 5). The different domains also demonstrated good internal consistency and correlation within them shelves, test-retest reliability was also good. The questionnaire strength was found to be acceptable and reliable with an overall Cronbach's alpha for internal consistency of three domains knowledge, attitude and practice which was 0.68, 0.70, 0.60 respectively ($p < 0.01$) at 95 % CI and intra- class correlation scores for each domain questions in both test and retest were 0.83, 0.72, 0.60 and were significantly correlated ($p < 0.01$) at 95% C.I. (Table 7).

Fig. 1 Shows the knowledge domain regarding whole body donation, Responses (in%)

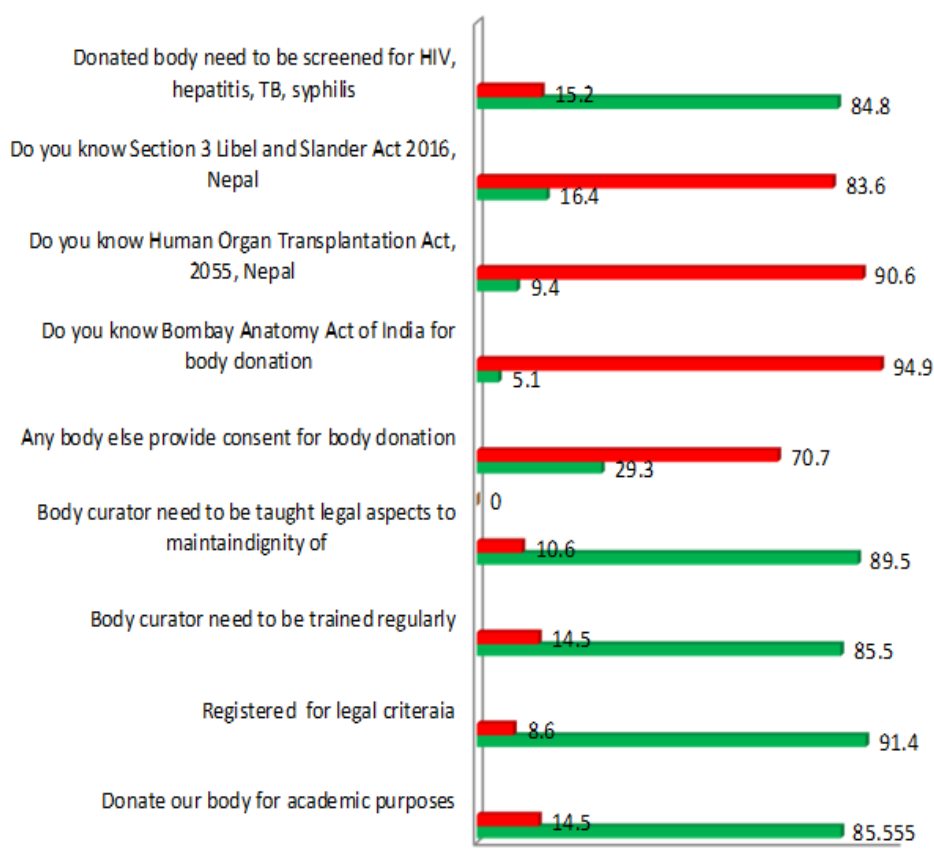


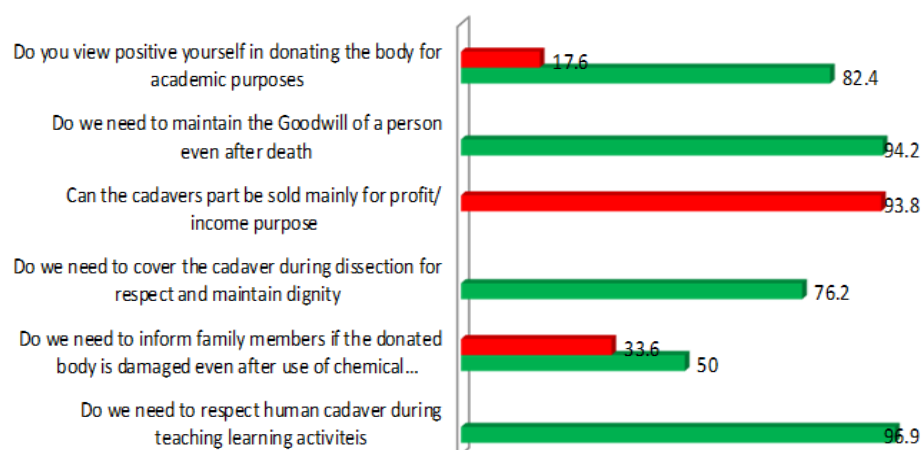
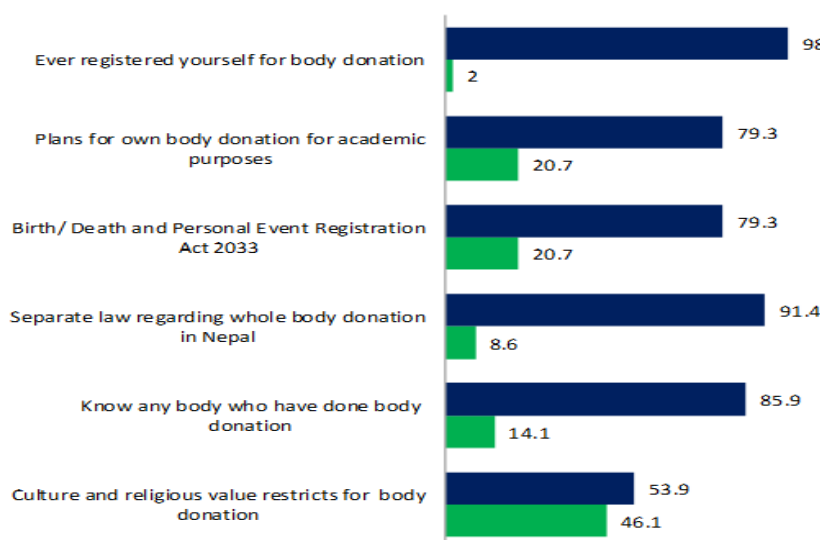
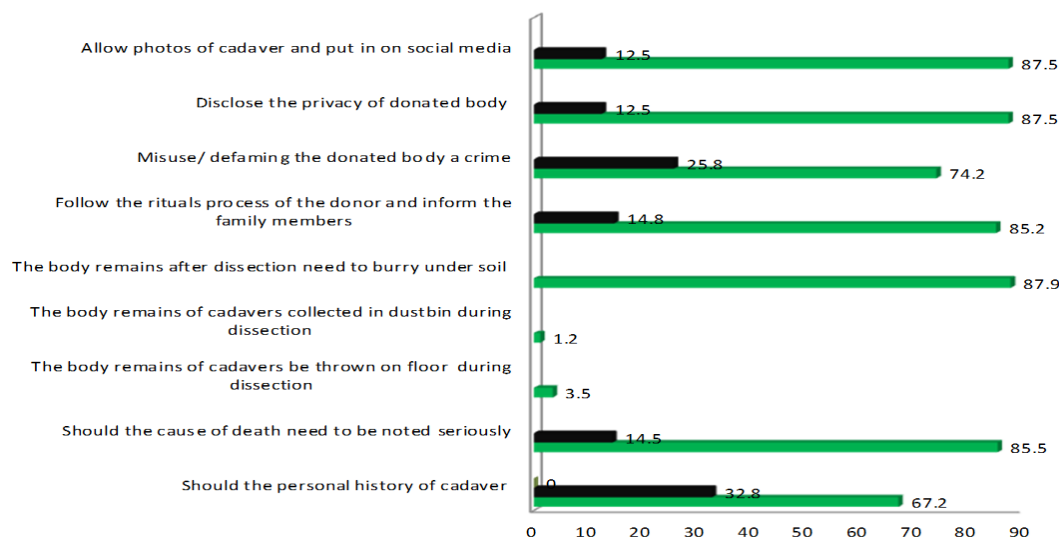
Fig 2: Shows the attitude domain regarding whole body donation, Responses (in %)**Fig. 3 Shows the practice domain regarding whole body donation, Responses (in %)****Fig. 4 Shows the practice domain regarding whole body donation, Responses (in %)**

Table 1: Mean and SD of total score of Knowledge, Attitude and Practice domain after pre-test and post-test (n= 264)

	Pre test Knowledge score	Pre test Attitude score	Pre test Practice score	Post test Knowledge score	Post test Attitude score	Post test Practice score
Mean	6.95	29.21	10.64	7.18	37.00	11.04
Std. Deviation	1.247	3.606	1.669	1.041	3.550	1.397
Minimum	3	12	5	4	21	6
Maximum	11	36	15	11	46	16

Table 2: Comparing mean for total score in different domains among all student under study (n= 264), Paired Samples Test

Domain	Mean score of domain	95% Confidence Interval of the Difference					
		Mean diff.	Std. Deviation	Std. Error Mean	Lower	Upper	p- value
Practice	10.64						
	11.04	-.395	2.170	.136	-.662	-.127	.004*
Attitude	29.21						
	37.0	-7.789	5.233	.327	-8.433	-7.145	.000*
Knowledge	6.95						
	7.18	-.234	1.577	.099	-.428	-.040	.018*

Table 3: Comparing mean for total score in different domains among MBBS student under study (n= 169), Paired Samples Test

Domain	95% Confidence Interval of the Difference					
	Mean diff.	Std. Deviation	Std. Error Mean	Lower	Upper	p- value
Practice	-.391	2.203	.174	-.734	-.048	.026*
Attitude	-7.491	5.544	.437	-8.35	-6.628	.000*
Knowledge	-.248	1.525	.120	-.486	-.011	.040*

Table 4: Comparing mean for total score after post-test in different domain among dental UG student (n= 95), Paired Samples Test

Domain	Mean diff.	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		p- value
				Lower	Upper	
Attitude	-8.295	4.642	.476	-9.240	-7.349	.000 *
Practice	-.400	2.126	.218	-.833	.033	.070
Knowledge	-.211	1.699	.171	-.550	-1.230	.222

Table 5: Correlations between knowledge, attitude and practice domain in Pretest- day 0 (bivariate test), n= 264

Correlations				
		Pre total knowledge	Pre total attitude	Pre total practice
Pre total Knowledge	Pearson Correlation	1	.110	.097
	Sig. (2-tailed)		.080	.122
Pre total Attitude	Pearson Correlation	.110	1	.171**
	Sig. (2-tailed)	.080		.006
Pre total Practice	Pearson Correlation	.097	.171**	1
	Sig. (2-tailed)	.122	.006	

** . Correlation is significant at the 0.01 level (2-tailed)

Attitude and Practices showed a direct and significant positive correlation ($r = 0.171$, $p < 0.01$)

** . Correlation is significant at the 0.01 level (2-tailed)

Table 6: Correlations between knowledge, attitude and practice domain after Posttest- day 2 (bivariate test), n= 264

Correlations				
		Post knowledge	Post attitude	Post Practice
Post Knowledge	Pearson Correlation	1	.418**	.146*
	Sig. (2-tailed)		.000	.019
Post Attitude	Pearson Correlation	.418**	1	.271**
	Sig. (2-tailed)	.000		.000
Post Practice	Pearson Correlation	.146*	.271**	1
	Sig. (2-tailed)	.019	.000	

** . Correlation is significant at the 0.01 level (2-tailed)

* . Correlation is significant at the 0.05 level (2-tailed)

Positive correlation seen with Attitude and Practices which was significant ($r = 0.271$, $p < 0.01$)

**Correlation is significant at the 0.01 level (2-tailed)

Table 7: Intra class Correlation (Test – retest reliability) Coefficient

Domain	Intra class Correlation	95% Confidence Interval	p - value
Knowledge	0.830	0.025 – 0.151	0.000
Attitude	0.725	0.011- 0.106	0.000
Practice	0.601	0.024-0.103	0.000

Significant at $p < 0.05$

Discussion

In a study, for the awareness, perception and attitude of whole body donation after death, 92.2 % (461) students knew about the body donation, 55.6 % students were willing to donate the bodies and 123 (24.6 %) of students apprehend that bodies would not be handled properly and finally denied to donate the body. They concluded it was due to lack of proper motivation & lack of awareness in policy and guidance to the public about body donation [1]. Our study revealed that 85 % knew whole body donation can be done for academic purposes in medical institution, 20.7 % were willing to donate body in future for teaching learning purposes 46.1 % revealed that their cultural and religious values restricted them which act as a barrier for donation program as they claimed right to a decent burial is the most basic right of human being and the cadaver remains deprived of this right for benefit of medical students. Similar findings were seen in a study conducted in United States [13].

In a study, among 205 medical professionals 8 % of medical professionals were unaware of term body donation and 85 % believed that donated bodies were misused. Only 22% of physicians were willing to donate their bodies for medical education. Only 7% had already registered their own names of body donation, 64 % were not aware of any known person having registered. They claimed that this was due to lack of knowledge regarding whole body donation for a academic purposes and recommended for mass awareness to non-medical professionals also [14]. Our study revealed that 85.9 % were not aware of any known person had ever registered for whole body donation, but interesting 2 % of them have done registration whereas 79.3 % had no future plans for their own body donation for academic purposes in a medical institute. Likewise, 96.9 % claimed that the dissected body need to be handled respectfully, 94.2 % urged to maintain the goodwill of a person even after death, 85.5 % responded that the body curators need to have a regular training for cadaver preservation and 89.5 % encouraged to teach the legal aspect and different Acts of body donation. This would enhance the knowledge of the curators so that the donated body won't be misused and mishandled. Hence to then maintain the dignity of human body even after death.

In a study among the 150 nurses, the average knowledge, attitude and practice score were (50.60 ± 16.19), (85.25 ± 35.61) and (34.43 ± 47.71) respectively [9]. There was direct and significant relation between attitude and practice ($r = + 0.33$, $p < 0.05$), but relation between attitude and knowledge was indirect and significant ($r = -0.183$, $p < 0.05$). Similarly in our study, score of knowledge, attitude and practice domain was (7.18 ± 1.04), (37.0 ± 3.55) and (11.04 ± 1.40) respectively which increased after the pretest. Attitude and practice showed a positive correlation and was highly significant ($r = 0.171$, $p < 0.01$) while after post-test, there was positive correlation of knowledge with attitude and practice which was significant ($r = 0.41$, 0.27 , $p < 0.05$)

Researchers proposed the creation of an international body donation programs in 2014, numbers of legal, ethical, cultural and religious aspects of current practice in body donation in European countries were reviewed to maintain respect for the body and created guidelines for good practice [5]. Our findings suggested many were unaware of various Act and provision in Law for the body

part donation. Most were uncertain and unsecured of religious and cultural aspect being not followed which is required to be after death due to lack of proper guidelines for good practice.

Authors included various cases with classification of material on Conflict of Laws and practical advice and caution to lawyers and legislators in considering the possible conflict elements in law during the use of cadavers [15]. Our study revealed the lack of proper and separate law regarding the use, handling of cadavers for academic purposes. Hence the lawyers and legislators in our country need to frame Act to address this matter.

According to some researchers, Human cadavers have lots impact on medical education and researches which are acquired from donors who have willed their body to science during their lifetime. The concept of donation through informed consent respects the autonomy of the donor and the dignity of the dead body [16]. According to a study in the United States, a number of body acquisition companies have been established which distributed the specimens to surgical training organizations, researchers and educational institutions with no charges to the receiving organizations for the bodies with a fee to cover the transport, handling and other services to create a profit with a constitute an ethically appropriate mechanism to obtain and distribute bodies. The combine role of these organizations and government is to address and develop guidelines for best practices so there is no violation of ethical issues in use and regulation of willed bodies [17-18]. On similar pattern, our government also can initiate the step to established best standard operating protocols to maintain and respect the dignity, ethical values for cadaver handling.

Conclusion

Lack of knowledge regarding various Acts for body donation, uncertain of not following the cultural and religious rituals process after death, fear of donated body being mishandled reduced the attraction towards body donation program. A positive and significant correlation between attitude and practice was present. Knowledge was seen not significant in UG students. The questionnaire designed was reliable which can be used to obtain the opinion regarding whole body donation for the academic purposes.

Mass awareness program is necessary to reduce the lack of knowledge which acts as barriers and to convince for the importance of body donation in medical education and research

REFERENCES

1. Kharkar A, Dase R. Whole Body Donation after Death: A Survey of Awareness, Perception and Attitude in Engineering, *International Journal of Current Medical and Applied Sciences*, 2016; 11(1), 42-46
2. Subramaniam BV. Law in relation to medical men. In modi ' Medical Jurisprudence and Toxicology' 22nd edition Butterworth, New Delhi, 1999, 724-27
3. Hasan T. Is dissection humane? *J Med Ethics Hist Med* 2011; 4:4
4. Granger NA. Dissection laboratory is vital to medical gross anatomy education. *Anat Rec B New Anat* 2004;281(1) :6-8
5. Riederer MB & Bueno-López JL. Anatomy, respect for the body and body donation - a guide for good practice, *The Teaching of the Anatomical Sciences. Eur J Anat*, 2014; 18 (4): 361- 8
6. Rajkumari A & Singh IY. Body donation and its relevance in anatomy learning- A review, *J. Anat. Soc. India* 2007; 56(1) 44-47
7. Champrey TH. Business of bodies: Ethical perspective on for profit body donation: *Clin Anat*. 2016; 29(1):25-9
8. Cornwall J, Winkelmann A, & Hildebrand. Cadaver Exome sequencing for teaching first year medical student, *JAMA* 2016; 316 (1), 102-3
9. Babaie M, Hosseini Madhi, Hamissi J & Hamissi Z. Knowledge, attitude and practice of nurses regarding organ donation. *Global Journal of Health Science* 2015; 7(6): 129-37
10. Kirthinath B, Shetty A & Maple SB. Knowledge, attitude and practices regarding whole body donation among medical professionals in a hospital in India. *Anat Sci Educ* 2011; 4(1):142-50
11. Singh VP, Singh RK, Moss T, Roy, Baral DD. Translation and validation of the Nepalese version of derriford appearance scale. *Modern Plastic surgery*, 2013, 3(2) :51-56
12. Shah B, Ayer A, Yadav BN, Jha S, Yadav SK. Development of a valid and reliable questionnaire to identify professional opinion regarding organ transplantation system. *Int J of Org*

- Transplantation Med 2017; 8 (3): 146-51
13. Michel A & Mikell H. Entrepreneurial ventures and whole-body donations: A regional perspective from the United States, *Social Science & Medicine* 2008; 66 (4):963 -69
 14. Ballal K, Shetty A, Bhat S. Knowledge, attitude and practices regarding whole body donation among medical professionals in a hospital in India. *Anatomical Sciences Education* 2001; 4(3):142-50
 15. Coster, Charles G. The Law of Cadavers and of Burial and Burial Places, *St. John's Law Review*: 2014; Vol. 11(1) : 35
 16. Winelmann A & Henry BM. Guidelines for reporting original studies-Quality and ethics, *Clin Anat.* 2016; 29(1):65-9
 17. Kahn PA, & Champrey TH. Incompatibility of use of unclaimed bodies with ethical anatomical education. *Anat. Sci. Edu.* 2017; 10 (2):200-1
 18. Henry BM, Vikse J, Pekala P, Loukas M, Tubbs RS & Walocha J. A Consensus guidelines for the uniform reporting of study ethics in anatomical research within the framework of the anatomical quality assurance (AQUA) checklist. *Clin Anat.* 2018; 31(4):521-4.

Acknowledgements

All the students of MBBS and BDS (2018 and 2017 batch) in BPKIHS, who voluntarily participated in this research work and their respective class representatives, who helped us in managing the time schedule between the vacant class and during SS for taking consent and data collection and UNESCO Bioethics Nepal Unit and steering committee members and Mr. Badri Gautam, Faculty of Law, T.U.

Conflict of interest: Nil

Funding: Nil

Biomedical Ethics and the COVID-19 Pandemic

Maria Coelho¹, Nicholas Antao², Rouen Mascarenhas³, Anu Kant Mital⁴

^{1,2,3,4}F.I.A.M.C. Biomedical Ethics Centre/ College Of Social Work (Nirmala Niketan)

Corresponding Author: Anu Kant Mital

E-mail: akmital@gmail.com

Introduction

The Covid-19 Pandemic has been a game changer. It is literally a showstopper. The first cases of COVID-19 were reported in Wuhan, Hubei Province, China on 31.12.2019. Soon thereafter, the virus engulfed over 185 countries. On 11.03.2020 the WHO declared COVID-19 a pandemic.

Everything the current generations knew and understood about the human condition- its limits and its challenges - have been tested. While the blame has been placed squarely on China's shoulders, the global spread has been perpetuated by ignorance, carelessness and in many cases, political or medical compliance. In this paper we will examine some hard facts and look at possible measures to mitigate these.

What We Are Dealing With

COVID-19 is an infectious disease pandemic that is spreading more rapidly than our healthcare resources can handle. The ethical issues of the pandemic, therefore, represent an intersection of the ethical problems of a contagious and highly morbid disease with the ethical concepts widely used in directing allocation of scarce resources [1].

This perfectly encapsulates the core issue that has been the heart of every economic problem i.e unlimited wants but limited resources. In pandemic terms, it would be understood as a major global health issue with severely limited resources – of knowledge about the virus, of the best possible response and of the material resources to contain, inhibit and eventually eradicate. Given that when the pandemic reared its ugly head around Dec 2019, there was absolutely little knowledge about the virility of this virus and its ability to jump across the globe. However, within a short span and several news reports of largescale deaths due to Covid-19 initially, especially in Italy, US, Brazil, France etc. the world knew it had a severe problem on its hands and no one could quite predict the way it would pan out.

The World Health Organization (WHO) which has been mandated to direct international health within the United Nations' system and to lead partners in global health responses [2], became the torchbearer for the nations in understanding and responding to this crisis. I remember checking the site as my organization quickly put in a Business Continuity Plan to respond to the situation. This was an official and respected node of information that we all referred to as we trudged along, and we still do.

As the Covid-19 crisis was declared a pandemic and nations (including India) went into lockdown the severity and gravity of the situation hit home. Such a direct social, economic, medical, psychological, and political impact was not experienced before by anyone alive today and a general state of fear prevailed at least in the first few months of the lockdown. Ignorance and misinformation also played a huge part and many an erroneous WhatsApp messages added to the confusion. People responded according to their educational levels, religious and superstitions beliefs, social and economic statuses. Job losses, shift to online education, severe social restrictions, lack of availability of food etc. led to increases in mental health issues, rise in domestic violence, sexual abuse especially of the vulnerable and children and such challenges.

Examining the bio-medical issues in the pandemic has to then be viewed, through this lens.

Issues

Unequal's Amongst Equals

As the days rolled on it became amply clear that those above 60 were the most vulnerable to the Covid-19 virus. Along with this age group, also those with existing co-morbidities became victims. Like in any largescale tragedy, whether a natural or man-made calamity, there is a direct correlation between the right to treatment and the availability of resources. Among those infected, who could get treatment, especially when requiring artificial respirators (which were limited) became an issue. Rumours of people being left to die because of non-availability of beds in hospitals or failure to get timely medical intervention due to the huge number of patients started doing the rounds. Those who could afford the expensive ICUs or those with political influence managed to get the much sought-after hospital beds. The poor and those who did not 'know' anyone, were made to go around in a miserable and sick state to hospitals trying to get in. The best solution here would be to re-allocate non-finite scarce resources, (that may be in short supply, but that can be resupplied) to the most medically deserving. However, the recovery process has been very slow and again corruption always remains a hidden push factor in such decisions.

A second medical dilemma was also about the efforts to save an elderly vis-à-vis a younger person. The ethical issue to using severely limited medical equipment in either case also must have been dealt with by many a medical professional.

In such cases the protocol followed in organ transplant could be of help. 'The social worth and the completeness of the recipient's life do not enter the equation because organs are allocated according to a strict protocol. This decision-making process is universally accepted and is regulated by tight oversight [3].

However, given the newness of the pandemic and coupled with the fact that there was no known medication that could help the patient, it was more of a wait and watch game rather than one of treat and heal. Added to this, the rough charges of treating covid patients would run into lakhs as per day charges in ICUs itself is quite high. Many insurance companies did not cover this pandemic and the economic burden on families wiped out the bank balances of many as well.

Though many hospitals started dedicated Covid wards and some even fully converting themselves to dedicated Covid treatment hospitals, this was not enough. The government in India prepared to house covid patients in specially designated areas set up on grounds, schools, and establishments as well.

When Covid-19 Takes Precedence Over Other Illnesses.

In the midst of all the high drama about the Covid-19 virus, with news reports, social discussions, business agenda, political statements etc. all making it their sole focus, the reality of the existence of other critical diseases like cancer, heart ailments, kidney failures, organ transplants, Alzheimer's, Parkinson's, motor neuron diseases, blindness and those undergoing rehabilitation etc. – all suddenly disappeared from conversations. It became as though they ceased to exist.

Pertinently, these major illnesses requiring medical intervention were postponed or called off because of again, non-availability of medical staff and resources or simply due to the high risk for co-morbid patients to the Covid-19 virus.

In any case, the untold misery, pain, and suffering that these patients have had to undergo is also a big ethical concern. Further several patients who did get admitted for their treatments also apparently contracted covid during their stay. As one could not really verify the authenticity of the reports, families would have no option but to rely on the hospital and believe them. This also added to aggravated medical costs.

Unverified rumours of organ harvesting as family members were not allowed to view the body of the deceased due to Covid-19 protocols also made the rounds. The severe lack of transparency along with the previous deficit of faith in hospitals who inflated medical costs added to the deepening of the fear factor.

The only solution in such cases is to provide authentic medical reports and transparency in dealings between the patient/ deceased's families and the hospitals.

Now, the government has encouraged health insurance companies to extend their medical cover to covid cases in a bid to stem this problem. Renewal premiums have also escalated.

Front Line and Health Care Workers

Lack of protection and care. While a health care worker cannot shirk away from the responsibility to providing health care to a patient who had contracted the virus, the question that needs to be asked is can he/she also refuse to assist? There were reports that those doctors who resigned to avert treating Covid-19 patients were threatened with legal action. The sheer numbers that inundated the hospitals and covid centers far outnumbered the medical professionals available. Most of them worked round the clock severely compromising their immunity due to long working hours, stress and exposure to the disease.

There were also several instances where medical workers were threatened by family members when they got patients to be compulsorily quarantined to avert the spread of infection. Some health care workers were also being evicted from the residences by their neighbors on account of the fear that they would spread the disease, apart from being subject to ostracization and discrimination [4].

There was also a severe shortage of PPE gear as well, which meant double exposure both to the medical staff as well as the patients. Governmental authorities were caught on a back foot with respect to protecting the medical front line staff. Most did not have appropriate PPE and were using alternatives like rainwear, helmets etc. A newspaper reports that as on April 9, 2020, nearly one-third of those infected in India were health care workers. It required the intervention of the Supreme Court to direct all State governments to provide proper PPE to the hospital staff. 'The order came to be passed with the following directions to provide all health care workers, amongst other things, with Personal Protection Equipment (PPE) to protect against Corona Virus, COVID-19, to provide them necessary police security to protect them from any violence, register offences against those who had perpetrated acts of violence against health care workers and to explore alternate local arrangements to augment domestic production for the production of the PPE' [5]. There are also many NGOs operating in the health care sector, SENHA being one of them in Mumbai. My organization recognized their need for PPE kits and as part of the CSR donated the same.

Several independent organizations working in this field receive little or no governmental assistance and must rely on Corporate and Private donations to fund their Covid-19 outreaches – which has a major impact in containing the virus spread.

Interestingly, even though the Supreme Court did pass the order, provision of the PPEs remains a challenge and relies largely on private charitable donations. The Centre in May 2020 ordered for 2.22 crore personal protective equipment (PPE), of which around 1.42 crore was to be bought from domestic manufacturers and the rest imported [6].

While on the PPE, the same applied to ventilators and other medical equipment and medicines such as Hydroxychloroquine and availability remains a core issue.

The important aspect of medical insurance for medical workers too is a taboo topic.

The scheme rolled out under the Pradhan Mantri Garib Kalyan Package covers loss of life due to COVID-19 and accidental death on account of COVID-19. No expenses on their treatment such as hospitalization and doctor consultation would get reimbursed if they were to recover after treatment [7].

While the medical workers are expected to put their lives at risk to treat Covid-19 patients, little is done to secure their own health.

A definitive bill by an Act of Parliament needs to be passed offering front line medical workers better packages, comprehensive insurance and suitable assistance as required if we are to encourage and support their service.

Further counselling, mental health services for these warriors should also be offered free of cost as they could face trauma, anxiety and stress related diseases resulting out of this situation.

Countries like Germany, Romania, Lithuania provided mental health, childcare, financial and other assistance to their medical workers during the pandemic. India needs to take a leaf from their book!

Reporting of Positive Cases

Patient confidentiality became a critical issue during the pandemic with the need to protect others at risk by association. Given that anyone can contract the covid-19 virus and it is class, status, gender, or age neutral, it has been easier to break the news. However, especially during the earlier days of the pandemic, social ostracization in several residential areas were reported leading to severe distress to the patients and their families.

As mentioned earlier, health care workers were also viewed with suspicion and access to their homes was also denied by neighbours largely out of fear and misinformation.

While it is not mandatory to declare one's covid status, it is still beneficial to the society around and also a good way to seek assistance especially if the family is in quarantine and needs supplies. In several areas though the societal stigma causes this declaration to become a more distressing situation and is also a reason many prefer not to declare the same.

A pathology lab worker who collects home samples for the RT PCR test also mentioned that when they visit societies, they are asked several questions by the security staff as to the covid status of the family they are visiting. Today however, with RT PCR tests becoming mandatory for travel etc., this line of questioning may reduce considerably.

Another emerging issue with regards to the RT PCR tests are the reported corrupt practices that are also on the rise. Several cases of using old negative reports by simply editing the date of testing are being reported. This is again putting the person as well as his/ her co-travellers at risk as in the event of being a covid-19 asymptomatic (and worse symptomatic) carrier, it will only cause more issues. This situation unfortunately can only be mitigated once the vaccination drive is towards completion, or a majority of the citizens get vaccinated.

Celebrities also play a big part in encouraging a collaborative mindset when they post their covid positive status over social media. It often makes the situation more acceptable to the general public. Government awareness drives in local languages, through educational and public institutions, public transport etc. are excellent ways to gain social acceptability of covid positive situations.

Clinical Trials, Vaccinations, And the Race to Commercial Profits

As there was no known cure when the pandemic hit, several pharmaceutical companies got into the race for clinical trials to bring out a vaccine. While it was still unclear, in the research processes, there were reports of deliberately infecting humans with the corona virus as part of the clinical trials in some parts of the globe with a view to accelerating these trials. Such reports however remain unverified.

Two vaccines that have been granted emergency use authorization by the Central Drugs Standard Control Organization (CDSCO) in India are Covishield® (AstraZeneca's vaccine manufactured by Serum Institute of India) and Covaxin® (manufactured by Bharat Biotech Limited). Both the Indian COVID-19 vaccines have completed their Phase I & II trials. Covishield® has completed its Phase III trials in UK and the bridging trial in India [8].

Second major issue lies with the equitable distribution of these vaccines. While most countries have affirmed their commitment to fair access for all the citizens and residents to the vaccine, it is only possible if the vaccines are mass produced and made available. The economic power of countries to purchase the vaccines for all their people will severely limit the scale and use of these vaccines in their lands, pushing up the economically forward in the hierarchy to receive the doses much before the poorer sections.

Fair distribution of a pandemic vaccine is unlikely without a solid ethical framework for allocation. This ultimately depends on 4 factors: the ability to develop or purchase; reciprocity; ability to implement; and distributive justice.

Further, especially in a huge country like India, misinformation is a chief cause of ignorant responses to the acceptance of the vaccines which have eventually rolled out.

Fear feeds on ignorance. Social media has played a huge part in this. However, with the government giving a push, creating awareness campaigns, and organizing the vaccination drives in an orderly fashion it is becoming more acceptable. Not to mention the requirement for vaccination certificates for renewal of all health insurances, further encouraging the acceptance.

The cause for concern is the continued availability of the vaccines through legal channels to avoid black marketeering, which usually occurs in such situations.

Not just availability but affordability is also an important criterion that needs to be looked at. Thankfully the covid vaccines offered by the government are in the Rs. 200/- range. The COVID-19 vaccine was launched on 16th January 2021. The first group included healthcare and frontline workers. The second group to receive COVID-19 vaccine are persons over 60 years of age as of January 1st, 2022, and persons between 45 and 59 years with comorbid conditions. This group started receiving vaccinations from March 1st, 2021. Those who are above 45 years of age will be able to take the vaccination from April 1st, 2021.

The vaccine roll outs are also predominantly in the urban areas with online registration being the mode of securing the spot. If anyone does not have access to the online mode, it will be a long wait to get vaccinated. India stands second in the world in terms of the number of vaccine doses administered (as on 25th March 2021 with 8 states having administered highest number of Covid-19 vaccine doses - source Hindustan Times).

SOPS And Requirements

Another common challenge especially at the onset of the pandemic was the clear standard operating procedures to stem the spread. It took some time and learning from the infected countries after the virus had claimed thousands of lives to understand the basic procedures of sanitizing, washing hands with water and soap, wearing masks and the most commonly used measure of a lockdown.

However, there were quite some challenges with these.

Access to clean water and sanitary conditions for a country like India itself is a non-reality. Soap and sanitizers and proper masks were still beyond the reach of many. To expect adherence without provisioning on the part of the government is fallacious. We are still a country where spitting, defecating in the open and living in slums is acceptable. In such a scenario, the spread of the virus is a given.

Further, declaring a lockdown with no reaction time hit millions of citizens very badly. The most vulnerable of the lot were the very young, elderly, single and the sick. Each was left to his own with fear and anxiety playing havoc on many.

Conclusion

I have attempted to capture some of the challenges and ethical issues that we have encountered over 2020. Needless to say, there is hope on the horizon but the danger is still not over. As the vaccines roll out, at least in India, witnessing the process it is heartening to note that the exercise has a method. However, we have a really long way to go to normalize life and recover in every way – emotionally, economically, psychologically, socially and mentally from this event. Meanwhile, we live another day, grateful to be alive and hopeful of a bright future.

References

1. Ethics in the Time of Coronavirus: Recommendations in the COVID-19 Pandemic. Jessica B. Kramer, MD, Douglas E. Brown, PhD, and Piroos K. Kopar, MD* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7194670/>
2. <https://www.who.int/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7194670/>
4. <https://www.theleaflet.in/supreme-court-directs-the-government-to-provide-ppe-to-health-care-workers/#>
5. Business line, April 8,2020 <https://www.thehindubusinessline.com/news/covid-19-insurance-only-death-cover-not-treatment-expenses-for-health-workers/article31288553.ece>
6. https://www.mohfw.gov.in/covid_vaccination/vaccination/faqs.html#vaccine-registration
7. <https://pubmed.ncbi.nlm.nih.gov/32532826/>
8. <https://www.who.int/teams/health-ethics-governance/diseases/covid-19>

Solidarity And Justice in an Individualistic World ?

María de la Luz Casas Martínez¹

¹Interdisciplinary Center for Bioethics, Universidad Panamericana, Mexico

Corresponding Author: Maria de la Luz Martinez

E-mail: mcasas@up.edu.mx

ABSTRACT

Human vulnerability has come to light in recent years because today's individualistic and hedonistic society has not been able to ignore the fact that it is weak compared to nature and that science, although powerful, cannot completely avoid human suffering.

Martha Nussbaum provides us with an informative reflective basis from which we can see that individual and collective suffering should lead us, through solidarity and altruism, to attempts to subsidize the social effects of suffering. We should not only understand suffering, but also remedy it, and one way to do so is found in politics. Vulnerability and justice are necessary approaches in our society.

Key words: Vulnerability, justice, empathy, suffering, bioethics.

The current problem

As of March 2021, the SARS-CoV-2 pandemic resulted in more than 115 million positive cases and 2.5 million deaths worldwide. In the absence of a vaccine, building herd immunity against SARS-CoV-2 through natural infection was theoretically impossible.

The herd immunity threshold depends on the basic reproduction number (R_0) and is defined as $1 - 1/R_0$. The more contagious a pathogen is, the higher its R_0 and the greater the proportion of the population that must be immune in order to block transmission on a sustained basis. The herd immunity threshold may vary among populations given that R_0 depends on several factors, such as population density and structure.

In the case of SARS-CoV-2, several studies have estimated an R_0 between 2 and 6. Assuming an estimated R_0 of 3, the threshold for herd immunity is 67%. This means that the incidence of infection would begin to decline when the proportion of persons with acquired immunity to SARS-CoV-2 exceeds 0.67. This model is based on assumptions that are unlikely to be met in reality, such as homogeneous population mixing and uniform immunity in recovered persons across all demographic groups.

The most relevant measure for assessing the social consequences of achieving herd immunity is the overall SARS-CoV-2 case fatality rate (TLI) (the proportion of SARS-CoV-2 deaths among infected persons). By combining the TLI with an estimate of the number of persons needed to achieve herd immunity, the number of deaths expected as a result of reaching this threshold can be calculated. The TLI of COVID-19 remains uncertain given that all cases are not detected (especially asymptomatic and mild cases). The authors assumed a TLI of 0.6%, and, together with a herd immunity threshold of 67% ($R_0 = 3$), estimated that the absolute number of expected deaths worldwide would exceed 30 million people.

Given this estimate, and taking into account uncertainty around how long protective immunity lasts after an infection, it would be too risky to bet on achieving herd immunity. Such a bet would likely cause millions of deaths, making an effective vaccine the most logical option in the face of this pandemic.

Although the WHO mobilized a network of partners, through the R&D Blueprint for Epidemics, to identify, prioritize and accelerate the development of diagnostics, vaccines and treatments needed to fight the virus in the long term, one foreseen problem centers on subsidiary and solidarity-based access. This is because, while the coronavirus poses equal threat to all countries, more developed nations are better prepared to contain the virus where and when it appears. Poor or emerging countries, for their part, lack the most basic means for detecting and preventing new pathogens, including surveillance systems, diagnostic capabilities and infection prevention and control.

The fact is that this pandemic was caused by globalization and can only be contained by the same mechanism, namely the achievement of global immunity through vaccines.

Success fundamentally depends on global solidarity and a collaborative commitment to protect health across the board, as Lederer points out.

It is understandable that each country prioritizes the protection of its population, but vaccine hoarding has happened before. In the current situation and according to Reuters, rich countries have secured 1 billion more doses of the Covid-19 vaccine than they need, leaving poorer nations with little chance of obtaining it.

Tedros Ghebreyesus, Director General of the World Health Organization, already denounced this phenomenon, calling on the G7 countries to fulfill their commitments to Covax, the WHO-led global initiative to ensure equitable access to COVID-19 vaccines worldwide.

Ghebreyesus stated, "You should talk to your constituents saying: 'The best way to protect yourself is not only to vaccinate yourself, but to vaccinate the rest of the world, to share the vaccine with the rest of the world. If this virus is not defeated everywhere, we can't defeat it globally. It will have a safe haven somewhere and will be able to fight back.'"

Last week, UN Secretary General Antonio Guterres warned against global inequality related to vaccine distribution, noting that 10 high-income countries have cornered up to 75% of all vaccines, while more than 130 countries have not received a single dose.

Pope Francis echoed a call to heads of state, saying: "I ask everyone, heads of state, companies, international organizations, to promote cooperation and not competition, and to seek a solution for all: vaccines for all, especially for the most vulnerable and needy in all regions of the planet. First and foremost, the most vulnerable and needy."

The problem is clear, as is the solution: without solidarity, sustainable progress in the face of this pandemic will remain unattainable. Nationalism will only prolong the problem.

Can Altruism Be Expected in an Individualistic Society

The actions associated with solidarity and subsidiarity are based on altruism, which, in turn, is based on empathy. The latter relates to an individual's cognitive and emotional ability to put him or herself in the emotional situation of another and understand the other. From that understanding, the desire to help arises. On the other end of spectrum, we find individualism and selfishness. Unfortunately, our society encourages behaviors associated with the latter, but desires the former. Today, big cities separate community members, fragmenting them into close, but small, groups of family, friends, neighbors, activity partners, etc.; real coexistence with those outside of these groups is lacking and they are considered strangers with whom emotional ties are nonexistent. This is why it is important to point out that empathy is not just a form of sympathy. Recognizing in others a commitment to solidarity should not just be based on closeness and emotional ties, but should also include a ethical and social commitment to the idea that we as a group survive in true community (common-unity) where we feel co-responsible for the welfare of others, rather than in just any kind of organization.

In terms of bioethics, this approach is summarized in the principles of solidarity and subsidiarity. We can all give, but this does not exclude the fact that we are also needy. Ethical alienation is one of the main factors associated with dehumanization.

Donation contains a strong element of altruistic giving. The fostering of related empathy has several components: one-part stems from the personality of the donor-subject and his ethical experiences, another from social imitation, as well as from formal, moral or religious education. Empathy is evident through action, which is currently studied as pro-social behavior. Empathy, then, is a disposition and intention towards pro-social behavior that includes supportive action. Pro-social behavior is shaped by actions that seek to benefit others without the expectation of external reward. These actions involve cost, sacrifice, or risk to the individual, and are a response to rational motivations and positive emotional states that come from mature and healthy personalities. Given that these behaviors have an educational component, it is important to encourage pro-sociality and, in connection with this, empathy in children and adolescents, stimulating a progressive decentering of the ego. As Calvo points out, actions that encourage this include the following:

- Sensitization to other people's feelings
- Explanation of the consequences that one's own behavior may have for others and oneself.
- Observation of empathic models accompanied by moral reflection on them.
- Observation of successful role models that support the conviction that following such conduct will provide the individual and society with an ethical benefit.

Within the phenomenological perspective, ethics is given by the recognition of the "I" and of "another I, with whom I identify myself as a human being," which is the "you." By recognizing our similarities, we develop ethical bonds, i.e., a reciprocal recognition of obligations of beneficence.

Some currents that explain altruism do so on this basis of recognition between similarities, called unity. Feeling empathy for someone produces a union between the "self" and the "self of the other." When unity is achieved, helping the other person is equivalent to doing something positive for oneself. Promoting empathetic attitudes in a utilitarian and pragmatic society is a challenge, and a necessity, for a more humane coexistence.

How can altruism be encouraged?

This is undoubtedly one of the keys to the realization of free and adequate systems. The first point involves combating individualism with solid social education in the sense of promoting the values that the community shares at school, in the family and in the media. It also involves promoting free, individual decision-making that includes conviction of social duty and a recognition that forming part of a community confers responsibilities and rights.

Another very important aspect involves adequate communication and transparency on the part of the institutions involved since society, convinced that justice will be applied, will thus be willing to make certain sacrifices in favor of others in need.

When it comes to the achievement of expeditious worldwide vaccination coverage, political decisions prevail, and so it is essential that certain actions be aimed at raising public awareness of this need, explaining not only the moral value of associated acts, but also the pragmatic implications.

It should not be forgotten that ethical actions (ethics of maxims) arise from individuals' moral conviction; therefore, they enter the field of freedom and are not always the first choice of action. To promote this kind of action, institutions concerned with the common good through non-maleficence and justice are required.

If each population were to understand that, due to globalization's role in the transmission of germs, acceptable immunity in each country will only be achieved if social (herd) immunity is achieved for the whole world, there would not be as much social pressure on the State to accumulate vaccines. Thus, the subsidiary principle could be more easily exercised.

Therefore, regardless of the perspective, whether it be an ethics of maximums or of minimums, or a personalist or utilitarian approach, all agree on the need for high-income countries to show solidarity with those who do not have sufficient income to broadly access the vaccines needed.

Conclusion

Solidarity exercised by high-income countries with poor or developing countries is both a moral and an epidemiological necessity. Highly developed countries' decision to support underdeveloped ones can be based both on a personalist ethic that is respectful of human rights and the dignity of each person— and, therefore, holds an obligation of subsidiarity, -- and from a utilitarian stance since other countries require universal coverage in order to achieve lower rates of contagion in one's own community. Often, bioethical decision-making processes, which respect plurality, do not always agree on the philosophical bases of argumentation, but agreement can be reached regarding the recommended actions since, for one reason or another, the resulting decisions that positively impact individuals and societies.

Therefore, for altruistic reasons, based on solidarity, as well as for pragmatic or utilitarian ones, which prioritize action that conveniently achieves an end, the equitable distribution of vaccines is imperative. In practice, acts of solidarity should be based on ethical reasons as well as those based on social convenience in an effort to help people recognize that they contain both personal and social benefit.

We all live on the same planet, our home, and only together can we face the challenges that impact each and every one of us in this global world.

REFERENCES

1. World Health Organization (WHO) How is WHO responding to COVID-19. 2021. Available in <https://www.who.int/es/emergencies/diseases/novel-coronavirus-2019>.
2. Randolph HE Barreiro LB. Herd Immunity: Understanding COVID-19. *Immunity*. 2020 ;52(5):737-741.
3. World Health Organization (WHO). An R&D Blueprint for Action to prevent Epidemics. 2020. Available in https://www.who.int/bluerint/what/improvingcoordination/workstream_5_document_on_financing.pdf.
4. Lederer Edith. UN criticizes that 10 countries have administered 75% of all doses. Rich countries stockpile 1 billion more vaccines than they need. February 2021. Available in: <https://www.forbes.com.mx/mundo-paises-ricos-1000-millones-vacunas-mas-necesarias/>.
5. Reuters. Rich countries have stockpiled 1 billion more coronavirus vaccines than they need. 2021. Available in: <https://www.reuters.com/article/salud-coronavirus-vacunas-idLTAKBN2AJ15A>
6. Ghebreyesus T. Appeal to pay attention. Available in: <https://www.who.int/es/news/item/03-02-2021-michael-r.-bloomberg-and-dr-tedros-adhanom-ghebreyesus-call-for-global-focus-on-noncommunicable-diseases-to-save-lives-from-covid-19>
7. Simsek Ayhan (2021). WHO urges solidarity to bring anti-COVID-19 vaccines to poor countries Available in <https://www.aa.com.tr/es/mundo/la-oms-insta-a-la-solidaridad-para-llevar-vacunas-anti-covid-19-a-los-paises-pobres/2153428>.
8. Los Angeles Times. 2021. Available in: <https://www.latimes.com/espanol/internacional/articulo/2021-02-17/la-onu-pide-revertir-acceso-desigual-a-vacunas-contr-covid-19>.
9. Pope Francis. Urges people to receive Covid-19 vaccine. 2021. Available in: <https://www.vaticannews.va/en/pope/news/2021-08/pope-francis-appeal-covid-19-vaccines-act-of-love.html>
10. De la Herran Gascón Manuel. Selfishness, cooperation and altruism. 2019. Accessed 5 Sept. Available at: <http://polired.upm.es/index.php/boletincfs/article/view/2197>.
11. Calvo, Patricio. Cordial reciprocity the ethical foundation of cooperation. *Ideas and Values*. 2017; 66(165):85-109.
12. Dugatkin LA. What is altruism: the scientific search for the origin of generosity. 2007. Madrid. Katz Editores / Katz Barpal S.L
13. Cialdini, RB, Brown SL, Lewis BP, Luce C, Neuberg SL. Reinterpreting the empathy–altruism relationship: When one into one equals oneness. *J Personal Soc Psychol* 1997;73(3):481–94.

Acknowledgements: Nil; Conflict of Interest: Nil; Funding: Nil

Designing a Workshop on Advocating Research Ethics Teaching Skills to Trainers in Academic Institutions of Developing Countries

Gebeyehu Tsega Nebek¹, Yawkal Tsega Nebek², Belete Fenta Kebede³, Khin Thet Wai⁴

¹Assistant Professor, Department of Health Systems Management and Health Economics, School of Public Health, Bahir Dar University, Bahidir, Ethiopia.

²Lecturer, School of Public Health, Wollo University, Dessie, Ethiopia.

³School of Midwifery, Institute of Health College of Medical Science, Jimma University, Jimma, Ethiopia.

⁴Director (Retired)/Independent Consultant, Chairperson, Institutional Review Board, Department of Medical Research, Myanmar.

Corresponding Author: Gebeyehu Tsega Nebek

E-mail: gebishts@gmail.com

Research ethics is a part of bioethics alongside medical ethics. It is an important discipline to study by researchers, academia, Institutional Review Boards, Research Ethics Committees (IRBs/RECs) and health care professionals apart from under graduate and post graduate students at the academic institutions of both western and non-western societies [1-2]. Research ethics and integrity are fundamental for other competencies and requirements in conducting research. In light of bioethics, the approach to problematization is envisioned as lifelong learning [3]. The notions of morality, moral learning, moral sensibility, narrative imagination, cultural values and human rights are central to ethics teaching. These are critical for reaching a moral agreement or consensus by clarifying morally acceptable solutions in different scenarios [4].

Four cardinal principles of ethical framework: autonomy, beneficence, non-maleficence and justice govern research ethics practice in a given social, cultural, and economic context. The applicability of theoretical models for research ethics practices in medical and health related fields changes over time in response to unethical research practices, such as misconduct-plagiarism, falsification and fabrication (FFP)- and questionable research practices, globally and in the local context of resource limited developing countries [5-6]. An evolution of the research ethics curriculum in academic institutions for undergraduate and postgraduate courses calls for the inclusion of an effective and sustainable approach to facilitate the moral learning process [7]. The UNESCO is responsible for implementing bioethics education in academic institutions. In addition, the United Nations Agency has supported Ethics Teacher Training Courses globally since 2004 and has highlighted relevant teaching/learning skills and methodology.

Situation Analysis: Problem Identification and Determinants

In developing countries of Africa, Asia and the Pacific, and Latin America, current programmers address research ethics teaching by adopting a variety of approaches (training courses conferring degrees/diplomas, workshops, seminars, and lectures) [8-9]. A conventional Socratic method used by facilitators during the group work might enforce the participants' behavior as desired in teaching ethics. Nevertheless, there are some limitations which is reflected by increasing research misconduct such as plagiarism, falsification and fabrication in these contexts [7]. New and innovative educational tools such as case-based teaching and flipped classroom are applicable to teach bioethics inclusive of research ethics to cultivate research integrity among academia. In this regard, the role of casuistry and artistic representations mobilizes emotions and facilitates learning process and critical thinking ability requires meticulous attention in ethics teaching [8-9]. However,

anecdotal evidences indicate weaknesses and incompetence in teaching skills in research ethics. Likely determinants include lack of proper training courses (and curriculum), incompetent facilitators/instructors, lack of infrastructure, administrators' commitment to train teachers in research ethics, not given priority to research ethics compared to other disciplines, and inadequate technical and financial resources to conduct regular training workshops in developing countries.

Justification and Feasibility

It is mandatory to strengthen the capacity of research ethics teaching skills in developing countries [10] where there is an emerging and re-emerging public health problems and increase in fund flow by giant pharmaceutical firms, vaccine and diagnostics companies by means of regular workshops for trainers. In a real life situation, it will happen only by technical and financial support and sharing of material resources in terms of north-south and south-south collaboration between academic institutions of Africa, Asia and the Pacific and Latin America. A case-based learning model incorporated in this workshop approach could mobilize small group discussions, arguments, dialogues, reflections and deliberations to elucidate the array of opinions, perceptions and their practical experiences [11-12]. Those outputs could influence and stimulate further ethical reflections sometimes in more insightful and deeper thoughts. This will enhance a reciprocal learning process when teaching moral and ethics concepts and issues. It is expected that improved teaching skills of qualified and competent teachers will help improved adult learners/students in profound understanding of the research ethics principles, standards, challenges and dilemmas to protect vulnerable populations and building trust on science/research (free from misconduct and questionable research questions) when conducting research. Cognizant of this, our team of four participants proposed this workshop intervention to champion research ethics in global south by means of competency that we have learned through the SACCADE project (Strategic And Collaborative Capacity Development in Ethiopia and Africa). Moreover, this project intervention will serve as a template at the regional level for strengthening the capacity of a core group of trainers in ethics teaching skills.

Objectives of the project intervention

General Learning Objective

To acquire the relevant knowledge and skills related to pedagogic tools and procedures in teaching research ethics and to gain insight on underlying theoretical framework at the academic institutions of developing countries of the respective region (Asia and the Pacific, Africa and Latin America)

Specific Learning Objectives

At the end of the 5-day workshop, the learners/attendees will be able to:

- Aware of the role of morality, narrative imagination, moral sensibility, culture, values, human rights principles and critical thinking quality in teaching research ethics;
- Gain knowledge and competency required for how to incorporate artistic representations (audio, visual, audiovisual) in teaching research ethics through Socratic Method and Case-based model;
- Understand the pros and cons of each pedagogic tool in teaching research ethics;
- Strengthen their capacity/skills in teaching research ethics in different scenarios by appropriate use of multiple pedagogical techniques

Proposed Activities

The virtual workshop of 5 days is aimed for senior researchers, senior academic staff, doctoral students, IRB/REC members, senior healthcare professionals of the respective region with prior training and or attained a degree in bioethics/research ethics. The workshop will cover three major topics, one forum for deliberation, two group works that reflect case-based models and two plenary sessions.

Human resources responsible for the activities will include the assigned well experienced two Lecturers/Facilitators of the Academic Institutes and accredited REC/IRBs within the specified Region and two invited International Lecturers/Facilitators with expertise in bioethics/research ethics. There will be a group of web masters, technical assistants to handle audio-visual (AV) aids, video clips and a secretariat to manage required e-learning materials, facilities for breakout sessions and plenary sessions. For each didactic lecture, there will be 60 minutes of presentation and 60 minutes of discussion.

A forum for deliberation will last for three days. The duration of time given for each group work will be one hour and each plenary session will last for two hours. There will be one event every year and will be able to train 30 participants per training course. The faculty of the Academic Institute in developing countries which already has the capacity to host the training courses or the Academic Institute will act as the host for this training course.

Topic 1: Theoretical Foundation: morality, moral sensibility, narrative imagination, culture, values, vulnerability, human rights principles, and critical thinking ability in teaching research ethics;

Topic 2: Pathways to gain moral and ethical knowledge: Socratic Method, Case-based model, dialogue, deliberations, debate, artistic representations

Topic 3: Selecting multiple pedagogic tools: pros and cons of each pedagogic tool, developing country specific artistic representations prepared for teaching research ethics.

The relevant material resources for the training course are expected to be shared by north-south collaborative partnership between the host Institute and the Centre for Medical Ethics, University of Oslo, Norway.

Evaluation Plan for Course Attendees

For achievement of the course objectives and the expected outcome, the following indicators are to be measured:

- Frequency of participation of each attendee in a forum for deliberation
- Improved awareness, knowledge and understanding towards research ethics teaching skills to be measured by a structured questionnaire (before and after the workshop)
- In the course evaluation questionnaire in a 5- point Likert scale, the following will be included:
- To what extent do you think yourself about understanding research ethics; morality, cultural values, moral sensibility, narrative imagination, vulnerability and research ethics;
- To what extent are you confident in your understanding of pathways to gain moral and ethical knowledge (include Socratic Method, Case-based model, dialogue, deliberations, debate, artistic representations);
- To what extent are you confident in how to use multiple pedagogic tools in teaching research ethics?

Conclusion

Research ethics and research integrity education for those who are engaged in research are critical components in preventing research misconduct. Improving research ethics teaching skills by myriad of approaches is desirable and requires sustainability. The implications of this proposed intervention incorporating multiple pedagogical techniques appropriate for the given context require close monitoring and evaluation when implemented.

REFERENCES

1. Moges Gebreegziabher Woldu | Michael William Scott (Reviewing editor). Unpacking research ethical stands and practices in academic institutions: A case study of a university from Ethiopia, *Cogent Social Sciences*, 2019. 5:1,
2. Khowaja-Punjwani S. Issues of Research Ethics in Developing World. *EJAIB* 2016;26(1).

3. Vidal S. Education: Lifelong Learning. In: H. Ten Have (ed.), Encyclopedia of Global Bioethics, 2015.
4. Solbakk JH. Therapeutic doubt and moral dialogue. J Med Philos 2004;29(1):93-118.
5. Beauchamp TL, Childress JF: Principles of Biomedical Ethics. 2008, USA: Oxford University Press, 5th Edition.
6. Rijal S and Bibek Dahal B. Building Capacity for Research Ethics: Policy Insights For Nepal. J Educ Res 2022;12(1):13-32.
7. Dadi LS, Thandar M, Thwin TG, Wai KT. Introducing a Transformative Intervention for Trainers of Research Ethics Education in Medical and Health Related Field in Developing Regions: A viewpoint. Global Bioethics Enquiry 2022;10(2):101-104.
8. Birnbacher D. The Socratic method in teaching medical ethics: potentials and limitations. Med Health Care Philos 1999;2(3):219-24.
9. Sharma N, Lau CS, Doherty J, Harbutt D. How we flipped the medical classroom. Medical Teacher. 2015;37:327–30.
10. Chowning JT, Griswold JC, Kovarik DN, Collins LJ. Fostering Critical Thinking, Reasoning, and Argumentation Skills through Bioethics Education. PLoS One 2012;7(5):e36791.
11. Tammeleht A, Rodríguez-Triana MJ, Koort K. et al. Collaborative case-based learning process in research ethics. Int J Educ Integr 2019;15(6).
12. Tammeleht, A., Rodríguez-Triana, M.J., Koort, K. et al. Scaffolding Collaborative Case-Based Learning during Research Ethics Training. J Acad Ethics 2021;19:229–52.

Acknowledgements: Authors are grateful to Professor Jan Helge Solbakk, Professor Anne Kari Tolo Hagedsted, Professor Soren Holme of Centre for Medical Ethics (CME), University of Oslo (UIO), Norway and last but not the least our heart-felt thanks go to Dr. Susana M Vidal who is the guest researcher at CME-UIO cum Coordinator of the Virtual Modality and Pedagogic Approach for their sharing of innovative thoughts, meticulous attention, guidance and facilitation throughout this 5-week “Virtual Training Course for Teachers in Bioethics-How to teach Bioethics” (VTCTE) (October-November 2022) and the approval of the final project.

Conflict of Interest: Nil;

Funding: Nil

Scope of the Journal & Instructions to the Authors

Global Bioethics Enquiry is a journal of the UNESCO Chair in Bioethics and publishes reviews, original research papers, commentaries and case studies related to all issues in the field of Bioethics. Original viewpoints and narratives as well as poems in the field of bioethics are welcome. The journal also has a student section where articles in the field of bioethics written by undergraduate and post graduate students are considered.

THE EDITORIAL PROCESS

The manuscripts received shall be peer reviewed for possible publication with the understanding that they are being submitted to only this journal and not simultaneously submitted or accepted for publication elsewhere. The Editors shall review all submitted manuscripts initially. Manuscripts with scientific flaws or vague research designs may often be rejected. The journal will not return any unaccepted manuscripts. The reviewers shall review all papers in a blind review and convey their decision to the Editors. Within a period of 8-12 weeks, the contributors shall receive comments, need for corrections and notice regarding acceptance or rejection of the manuscript. Other journals appropriate for the paper may be suggested in some cases of rejection. Articles accepted would be copy edited for grammar, punctuation, print style, and proofs for correction shall be sent to the author prior to publication. Authors will be asked to sign a copyright form and undertaking for plagiarism in case of accepted manuscripts. Only upon receipt of corrected proofs from the authors and completion of all form required, will a paper be published in the journal.

TYPES OF ARTICLES

- **Original Research Papers or Article:** These papers should only include original research findings from planned research studies such as case-control series, surveys with high response rates, randomized controlled trials and treatment based intervention studies. Meta analyses shall be included in this section. The word limit is 6000 words excluding references and an abstract (structured format) of not more than 250 words with 4-6 key words.
- **Case Reports:** These should contain reports of new, interesting or rare cases of clinical significance or with implications for management. It could also include case reports where novel management methods were used. It has a word count of 1500 words with up to 15 references and an abstract of not more than 150 words.
- **Review Papers:** These are systematic and critical assessments of the literature which will be invited. Authors wishing to submit a review paper will have to contact the editor and seek permission for submission of the review. Only after permission has been sought will the article be accepted for peer review. The review article has a word limit of 8000 words and must be state of the art in every respect. Only invited reviews will be published. However exceptionally interesting topics even if uninvited when submitted may be considered.
- **Personal Subject Related Viewpoint:** These should be experience-based views and opinions on controversial issues that affect the profession. They could also be part of clinical problems that confront people in routine practice. The author should have sufficient experience or must have some unique personal experience based on the subject being considered. The word limit is 2500 words.
- **Announcements:** Information regarding conferences, meetings, courses, awards and other items likely to be of interest to readers should be submitted with the name and address of the person from whom additional information can be obtained (up to 200 words).

- **Book or Movie Review:** Exceptionally readable and good books and movies or documentaries which shall be academic and otherwise in the field of mental health shall be considered in this section. The word limit shall be 1500 words.
- **Poems:** Poems related to various themes in bioethics and allied sciences shall be considered based on their merit for this section.
- The journal is in evolution and newer concepts shall be considered from time to time.

SUBMISSION OF PAPERS

Send soft copy of the manuscript along with a covering letter in Microsoft Word 2007 or 2010. Name and designation of all authors with designation and name of the corresponding author must be mentioned. Copies of any permission(s) to reproduce published material, and to use illustrations or report information about identifiable people must accompany the manuscript.

All the manuscripts should be submitted via e-mail to the editor at email – russell.f.dsouza@gmail.com or avinashdes888@gmail.com

For online submission articles should be prepared in two files (first page file and article file). Images should be submitted separately.

First Page File: Prepare the title page, covering letter, acknowledgement, etc. using a word processor program. All information which can reveal your identity should be here. Use doc/pdf files. Please do not zip the files.

Article file: The main text of the article, beginning from Abstract till References (including tables) should be in this file. Do not include any information (such as acknowledgement, your names in page headers, etc.) in this file. Use doc/pdf files. Do not zip the files. Limit the file size to 400 kb. Do not incorporate images in the file. If file size is large, graphs can be submitted as images separately without incorporating them in the article file to reduce the size of the file.

Images and Tables: Submit good quality colour images. Each image should be less than 400 kb in size. Size of the image can be reduced by decreasing the actual height and width of the images (keep up to 800 pixels or 4 inches). All image formats (jpeg, tiff, gif, bmp, png, eps, etc.) are acceptable; jpeg is most suitable. Do not zip the files. All tables, figures and images must be duly labelled.

Contributor's form: If the manuscript is submitted online, the contributors' form has to be submitted in original with the signatures of all the contributors within two weeks from submission. The scanned copyright form can also be submitted via e mail.

Copyright: All authors retain exclusive copyright of the material published in the journal. A copyright form on the journals website must also be signed by the authors in the same regard.

PREPARATION OF THE RESEARCH PAPER (MANUSCRIPT)

Please use A4 size (212 × 297 mm) on Microsoft Word, with margins of 1 inch from all the four sides. If sending a hard copy, type or print on only one side of the paper. Use double spacing throughout. Number pages consecutively, beginning with the title page. The language should be British English or American English.

Language

For all purposes the journal shall follow the language pattern of American English.

Title Page

1. Type of manuscript (Original/Review/Case etc)
2. The title of the article, which should be concise, but informative;
3. Running title or short title not more than 50 characters;
4. The name by which each contributor is known with institutional affiliation;
5. The name of the department(s) and institution(s) to which the work should be attributed;
6. The name, address, phone numbers, facsimile numbers and e-mail address of the contributor responsible for correspondence;
7. The total number of pages, photographs and word counts separately for abstract and for the text (excluding the references and abstract).
8. Acknowledgements: Specify contributions that need acknowledging but do not justify authorship, such as general support by a departmental chair and acknowledgments of technical, financial and material support. Also mention financial grants received or conflict of interest if any.
9. If the manuscript was presented as part at a meeting, the organisation, place, and exact date on which it was read along with mention of any award it may have received.

Abstract Page

The second page should carry the full title of the manuscript and an abstract (no more than the number of words already specified). For abstract we follow an unstructured abstract format that should not exceed 250 words. Below the abstract should provide 3 to 6 key words.

Text of the article

State the purpose of the article and summarize the rationale for the study or observation in Introduction. For case reports give incidence of similar cases in past. Describe the selection of the observational or experimental subjects clearly in Patients and Methods section. Identify the age, sex, and other important characteristics of the subjects. Identify the methods, apparatus (give the manufacturer's name and address in parentheses), and procedures in sufficient detail. Give references to established methods, describe new or substantially modified methods, give reasons for using them, and evaluate their limitations. Identify precisely all drugs and chemicals used, including generic name(s), dose(s), and route(s) of administration. Reports of randomised clinical trials should be based on the **CONSORT statement** (<http://www.consort-statement.org>).

When reporting experiments on human subjects, procedures followed should be in accordance with the standards ethical committee on human experimentation and with the Helsinki Declaration of 1975, as revised in 2000 (http://www.wma.net/e/policy/17-c_e.html). Do not use patients' names, initials, or hospital numbers, especially in illustrative material. Present the results in logical sequence in the text, tables, and illustrations. Do not repeat in the text all the data in the tables or illustrations; emphasise or summarise only important observations. Use standard guidelines for statistics (See *Ann Intern Med* 1988;108:266-73).

Emphasize the new and important aspects of the study and the conclusions that follow from them along with implications of the findings and their limitations in the Discussion section.

References

References should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by Arabic numerals in brackets (). References cited only in tables or figure legends should be numbered in accordance with the sequence established by the first identification in the text of the particular table or figure. The titles of journals should be abbreviated according to the style used in *Index Medicus*. Avoid

using abstracts, unpublished observations, and personal communication as references. Please refer <http://www.icmje.org> for other types of references such as electronic media, newspaper items, etc.

1. Standard journal article: Seshadri L, George SS, Vasudevan B, Krishna S. Cervical intraepithelial neoplasia and human papilloma virus infection in renal transplant recipients. *Indian J Cancer* 2001;38:92-5.
2. List the first six contributors followed by et al.
3. Personal author(s): Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.
4. Chapter in a book: Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. pp 465-78.

Tables

- Tables should be self-explanatory and should not duplicate textual material. Tables with more than 10 columns and 25 rows are not acceptable. Limit the number to minimum required.
- Number tables, in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.
- Place explanatory matter in footnotes, not in the heading. Explain in footnotes all non-standard abbreviations that are used in each table. For footnotes use the following symbols, in this sequence: *, **, ***
- Obtain permission for all fully borrowed, adapted, and modified tables and provide a credit line in the footnote.

Illustrations (Figures)

- Submit three sets of sharp, glossy, un-mounted, colour photographic prints, with height of 4 inches and width of 6 inches.
- Computerised colour printouts are not acceptable.
- Figures should be numbered consecutively according to the order in which they have been first cited in the text.
- Each figure should have a label pasted on its back indicating the number of the figure, the running title, top of the figure and the legends of the figure. Do not write on the back of figures, scratch, or mark them by using paper clips.
- If a figure has been published, acknowledge the original source and submit written permission from the copyright holder to reproduce the material. A credit line should appear in the legend for figures for such figures.

Reprints

Journal does not provide any free printed reprints. Reprints can be purchased. Articles may be accessed online and pdf format will be sent to the authors. Contact the editor for any queries. Authors wishing to procure a hard copy of the journal may send their requests to the editor via email.

Plagiarism Policy

All articles will be examined by computer software for plagiarism. If it is found that a paper that has been submitted has been copied in parts or fully from an earlier published paper the authors will be duly informed and the paper may be rejected. Action against the erring authors may be taken as per recommendation of the editorial board.

Open Access Policy

The author grants free, irrevocable, worldwide, perpetual right of access to and a license to copy, use, distribute, transmit, and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship.