SUMMER TRAINING REPORT

BY

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ORIGIN AND THE EXISTENCE OF TELEMEDICINE AS AN EFFECTIVE HEALTHCARE SOLUTION IN INDIA

MBA (HOSPITAL AND HEALTH MANAGEMENT)

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Guides

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INTRODUCTION

Telemedicine is a term coined by an American named Thomas Bird in 1970's which meant "healing from a distance'. Telemedicine can be explained as the delivery of Realtime diagnostic and therapeutic services through various technological applications such as interactive audio video conferencing and online diagnostic tools when the patient and the doctor are not present in the same place. The Centres for Medicare & Medicaid Services (CMS), USA defines telemedicine as the "provision of clinical services to patients by practitioners from a distance via electronic communication".

HISTORICAL PERSPECTIVE

In India, Telemedicine was formally launched in March 2000 when the former USA president Bill Clinton commissioned the first unit with Apollo group of health services in association with ISRO starting a pilot project in a secondary hospital level with CT, ultrasound, Echocardiography, and 6 MBBS speciality doctors, 1 general surgeon and 1 paediatrician in a village named Aragonda 16 kms from Chittor, Andra Pradesh.

When talking about telemedicine in India, ISRO has played a great role in providing telehealth even to the rural parts of the India with the aid of HEALTHSAT where 75% of the country's population exists. Till recently, ISRO has covered 384 hospitals with 60 speciality hospitals connected to 306 remote/rural/district/medical college hospitals and 18 Mobile Telemedicine units across the country through its geo-stationary satellite which has marked a continuous improvement in quality of healthcare in rural India[(8)]. This covers diverse areas of Cardiology, Radiology, Diabetology, Mammography, Ophthalmology, General medicine, Maternal and Child healthcare [(8)].

UTILITY OF TELEMEDICINE

- Patients who require home care and ambulatory treatment can be easily monitored by the doctors during essential times.
- With growing advancement of medical facilities, the need of updating the recent technologies among the doctors and paramedical staffs are essential, thus conducting CME's and research with telemedicine is much accessible.
- Using telemedicine in peripheral health set-ups can significantly reduce the time and costs of patient transportation [(8)].
- Telemedicine had played a major role in disaster management by connecting the people in need with the emergency specialists. Amrita Institute of Medical Sciences, Kochi sent its disaster management team and few telemedicine units to the Jammu and Kashmir floods in 2016, a medical relief camp was set up in Bandipore district of Jammu and Kashmir. A team of 15 paramedics and medical professionals providing critical medical care to flood victims in the worst-affected areas of the district including Ashtingoo Ghat, Kulhama, Laharwalpora.
- Follow-ups for the patients and even complex case interactions among the doctors can be done easily.
- Tele- mentored procedures like surgery using hand robots providing the treatment via robots to the patients and monitoring through web cam. Professor Marescaux et al performed the first successful telerobotic surgery done on endocrine on September 7, 2001 with a commercially available robotic surgery system, called Zeus T.
- It also plays a major role in the field of epidemiology by disease surveillance and program tracking, this includes structuring and gathering epidemiological data from primary and secondary data and then mapping and reporting this data to public health organization. Some of the applications for e.g., HealthMap and ProMed mail are two web-based services that help in tracking the global cases of disease outbreaks.

- It provides an opportunity for the countries to give its citizens a standard and equal medical service irrespective of their geographical area and accessibility by setting up telemedicine unit in peripheral hospitals connecting cities.
- Telemedicine can be proven as an asset for routine monitoring and for various therapies such as counselling sessions.
- Several advantages of telemedicine include electronic data storage, monitoring and remote analysis which helps in reducing cost and saving money. It also helps in eliminating the transportation expenses. Thus, easing accessibility, and reducing nosocomial infections therefore, focussing on preventive care approach.

CURRENT SCENARIO OF TELEMEDICINE IN INDIA

According to the economic survey of India 2019-2020, the doctor patient ratio in India is 1:1456 with respect to WHO standards of 1:1000. The census 2001 revealed that the density of all doctors which includes Homeopathic, Ayurveda , allopathic and unani calculated for the entire nation was found to be 80 doctors per lakh population . District-wise, the inequalities were counted to be extremely massive. The sum up of allopathic doctors with any level of education in the 30 districts with least doctors availability were listed and more than half of which were identified in north-eastern States and the rest in central States it was a little over 9.4 doctors per lakh of the population whereas, in the list of highest 30 districts, it was 159 doctors per lakh of population In order to provide optimal level of quality health care, [(11)]On 31st March 2019, the Rural health statistics report released by the Ministry of Health and Family Welfare Government of India states that for every 3000 to 5000 there should be a Sub centre and for every 20000-35000 population there should be a Primary health centre and for every 80000-160000 there should be a community health centre ,which are not currently satisfying the norms of IPHS (Indian Public Health Standards) But these standard dynamics do not satisfy the norms of Indian Public Health Standards (IPHS) . There is a gap between the availability of medical needs to the patients in the rural areas. One of the major factors that causes this inaccessibility is our larger geographical landscape with 65% of our population still living in the rural areas. Therefore, telemedicine will be a favourable solution for

providing timely care. It majorly cuts down the cost that they would spend to reach the hospital.

A report by Industry Journal 24 says the telemedicine market of Indian is growing tremendously and is affecting the international economy in terms of revenue and global market share from healthcare sector showing its greatest robustness. India is facing a substantial growth in the space of telemedicine, as it has broad rural-urban population whereas, the remote India is a destitute from medical amenities. Rural areas not only present several challenges for the service providers but also for the families who are ready to exercise these services because of their traditional ways of practicing medicine of facing the doctor face to face and their hesitation towards new practice of technology.

Telemedicine has expanded to a greater extent in India in the last decade. This sector is at an ever-growing stage with high scope of development. This prompt growth in the last few years represents telemedicine as the next benchmark in the healthcare. In Next five years a substantial increase in telemedicine services can be seen with the use of AI. In future, this will help in identifying issues related to medical health and diagnosing them. Constantly through IOT (internet of things) perspective medical emergencies like Asthma attack, heart failure and stroke can be diagnosed through connected devices and with constant observation of the doctors it can be given proper diagnosis at the essential time.

Telemedicine is the ground plan for providing updated medical care to reach the rural India. NITI Aayog provides us with, the National Health Stack (NHS) a virtual digital platform to provide better healthcare for our nation and to help achieve the desired Continuum of Care across primary, secondary and tertiary care.(17) The National Health Stack is a collection of cloud-based services. Each service provides just one capability across multiple health services, accessible via simple open APIs compatible with global standards.(17)The scope of the National Health Stack includes the following subjects: Induction of Private Hospitals and Private Practitioners into the Primary and Secondary healthcare ecosystem; Focus on Non-Communicable Diseases (NCD); Disease Surveillance; Health Schemes Management Systems; Nutrition Management; School Health Schemes; Emergency Management; e-Learning Platform for health, LMS, Telehealth, Tele-radiology; Diagnostic Equipment; Health Call Centre(s) etc. the NHS study focusses to have digital health records of every citizen of India by 2022 to make telemedicine and E-Health easy. Once implemented, it will significantly bring down the

costs of health protection, converge disparate systems to ensure a cashless and seamless experience for the poorest beneficiaries, and promote wellness across the population.

With widespread use of telemedicine in various fields, teleophthalmology played a great role in India with two successive projects running in the southern states Sankara Netralaya Teleophthalmology Project (SNTOP) and Aravind Teleophthalmology Network (ATN). Two hospitals, spaced by about 2 km, were connected via a LAN using fibre optic cables. About 100 patients were examined by the ophthalmologist using teleophthalmology concept, and video images were analysed. Based on the results of the above trials, in 2002, a Teleophthalmology Consultation Centre was set up at 300 km from Chennai. The connectivity was made using three ISDN lines at 384 Kbps and Satellite link. About 300 teleconsultations were done. The project was partially funded by ISRO. Initially, the districts surrounding the tertiary hospital were traced out. From the district, selected villages, which do not have the access to hospitals or doctors, were identified. As the first step, two social workers from the tertiary hospital visited the villages 3 months prior and obtained approvals from the village panchayat. Similarly, a schedule for about 12 villages was established. Once the approvals for conducting the camp in those villages was obtained, awareness about the mobile van's visit to the villages was made through local cable television, cinema theatres. The mobile van was designed to conduct a camp for 12 days continuously. Then the process was repeated. Thereby, the van was used for screening for 24 days in a month. The cost for conducting one camp was 18,000 INR. This service was given at no cost to the patients. Funding was provided through sponsorship. Currently, at least 150 patients are screened per day using this mobile services. Based on the results of screening, 30 patients are selected for teleconsultation with the central hub. Photographs are obtained with the fundus and indirect ophthalmoscope. Along with patients details, these images are transferred to Sankara Nethralaya central hub (batch of five patients) in a store-and forward method. After twelve patient's images and history are transmitted, the videoconferencing unit is connected with the central hub. Patients, the refractionist, and the consultant at central hub (Sankara Nethralaya) discuss the patient's condition. The ophthalmologist at Sankara Nethralaya makes the final diagnosis and prescribes the treatment. Trained personnel make suitable lens with the help of the grinding machine, mounts the lens in the frames chosen by the patients, and delivers the finished spectacles to the patients on the spot. Apart from this, the patients are counselled at the campsite. In order to create awareness

on eye donation, diabetic retinopathy, cataract, and glaucoma, regular awareness meetings are conducted in the campsite. Later a survey for satisfaction of this service is conducted.

The Aarogya Setu app is an example of a economically effective digital application that has been made available widely accessible software to be installed among citizens of the nation and also to keep track of the patients during the COVID19 pandemic. It was developed by the National Informatics Centre under the Ministry of Electronics and Information Technology (MeitY).The app was launched in order to trace the transmission and ensure the safety of each person and saw at a number of50 million downloads since its arrival to the market.

CASE STUDIES

There has been a significant growth in India in implementing telemedicine. But there has been a void in closing gaps in creating awareness, knowledge and attitude. Research on the use of telemedicine to broaden our perspectives, needs to be expediated.

Case study 1

A cross sectional study, Evaluation of patient and doctor perception towards telemedicine in India (Rajesh Acharya and Jasuma,2016) [(5)] was conducted to evaluate the effects telemedicine on patients and medical specialists. It was pilot study conducted in a nodal Telemedicine Speciality Centre (TSC) in Apollo Hospital, Hyderabad, Telangana, India. The study was conducted in two phases – the first phase was a separate questionnaire for the medical specialists from different branches of medicine. The second phase was questions for the patients from the North Eastern states of India. The questionnaire consisted of 13 questions pertaining to specialist perception and 9 questions concerning patient's point of view on satisfaction of the quality of service, economic feasibility in telemedicine and problems related to it.

The first phase of the study included 71 specialists from different branches of medicine who worked in TSC, Apollo Hospital, Hyderabad. For the second phase of the study, 51 respondents were chosen from the North Eastern Regions of India (Assam, Nagaland, Siliguri, Sikkim, and Manipur). Patients were selected randomly from the registry of

Apollo Telemedicine Consulting Centre (TCC) who were using telemedicine. The process of telemedicine included connectivity between a TCC and a TSC. The consulting centre had a high-end digital imaging and communications in medicine scanner for scanning X-rays and reports, for transmitting them to the specialty centre, a web camera for net meetings, and video conferencing equipment for video conference between the patients at TCC and the specialist at the TSC. The connectivity from the TCC to the TSC was done through either internet protocol leased line Integrated Service Digital Networks, or Very Small Aperture Terminal.

Perception on telemedicine practice

Apollo Tele Health Services provides infrastructure to the 116 specialists who practice telemedicine in the TSC and to the patients in TCC. A total of 51 specialists took part in this questionnaire survey. Seventy-one patients took part in the study. The complaints of patients varied from a headache to consultation and treatment in Orthopaedics, Neurology, Cardiology, Psychiatry, Urology, Dermatology, General Medicine, Obstetrics and Gynecology, Rheumatology, and Oncology.

[(5)]55% of the participants had 10–20 consultations per day, 22% had more than 20 consultations per day. 65% of participants devoted 1–2 hour per day of their time for consultation using telemedicine. All the doctors were satisfied with the treatment given through TSC. 94%of the respondents answered that they got desirable results on the diagnosis of patient's condition. Recall percent of patients in this study was 71%. About 94% of providers were open to promote telemedicine.

[(5)]About 90% of the respondents said their appointment was scheduled according to their convenience, 82% of the participants were satisfied with the treatment. 54%of the patients acknowledged that they did not have a problem in understanding the usage of telemedicine.

Cost-effectiveness on telemedicine

[(5)]About 89% of the patients stated that the treatment was both feasible and convenient; 7% felt treatment through telemedicine was costly for them but convenient, and 4% of the participants felt it was economical but not convenient.

S.no	Questions	Answers	n	%
1.	Was scheduling od appointment appropriate?	Yes	64	90
2.	Was detailed consent and history was taken before the treatment?	Yes	71	100
3.	Are you satisfied with the treatment given through telemedicine?	Yes	58	82
4.	Did you find the telemedicine service			
4a.	Feasible	Yes	3	4
4b.	Convenient	Yes	5	7
4c.	Feasible and convenient	Yes	63	89
5.	Would you like to recommend the telemedicine service to others?	Yes	63	89
6.	Did you find difficulty in understanding the process of telemedicine	No	38	54

Table:1: Questionnaire to the patients for perception towards telemedicine.

S.No	Questions	Answers	n	%
1.	Does telemedicine provide you with desirable results in patients diagnosis/treatment	Yes	48	94
2.	Patient consent with the treatment through telemedicine	Yes	51	100
3.	Patient’s turnup promptly for the recall checkup	Yes	36	71
4.	Patients flow for the telemedicine consultation since the commencement			
4a.	Increased	Yes	31	61
4b.	No change	Yes	18	35
4c.	Decreased	Yes	2	4
5.	Is telemedicine beneficial for your practice	Yes	45	90
6.	Would like to promote your colleagues towards telemedicine service	Yes	47	94

Table 2 : Questionnaire for the specialists for perception towards telemedicine

[5]About 90% of the specialists reported that telemedicine was beneficial for them, and 61% patient's inflow increased since the commencement of telemedicine practice as compared to 35% who reported no change.

Problems underwent by patients and doctors in telemedicine

[5]Issues faced by patients with the use of telemedicine were 24% on technical issues, and 18% were not satisfied with the treatment provided. Some of the reasons included uncomfortable using the camera, lack of personal face to face contact with the doctor.

Questions	No Problem	Technical	Information Inadequacy	Cannot understand TCC doctor	Uncomfortable in the face of camera	Lack of face to face contact with doctor
n	38	17	3	3	4	6
%	54	24	4	23	31	46

Table 3: Problems encountered by patients

PROBLEMS UNDERWENT BY DOCTORS

Technical n=24(47%)

Problem	n	%
Hardware	4	16.6
Software	3	12.5
Speed and clarity issues	17	70.9

Table 4 : Problems faced due to technical issues

Time schedule n=20(39%)

Problem	n	%
Delayed information	14	70
Time constraints	6	30

Table 5: Problems faced due Time scheduling

Communication lapse n=7 (14%)

Problem	n	%
Cant understand TCC doctor	4	57
Cant understand due to network problem	3	43

Table 5: Problems faced due to communication lapse

During the consultation, the doctors faced issues on the technical subject (47%), time scheduling (39%), and few of them (14%) had problems with communication lapse. None of the respondents had problems with the staff in TSC or TCC.

The feedback from this survey helped to learn and evaluate the facets of telemedicine and its limitation. This will improve telemedicine care and make it faster, handier, and easy to use. Telemedicine can benefit both the practitioner as well as the patient, but less is known in relation to financial benefit for both the doctor and the patient. The study was performed keeping all these points in mind.

Case study 2

Another cross sectional study “The attitude knowledge and skills of telemedicine among the health professional faculty working in teaching institutions”(Zayapragassarazan and Kumar, 2016). The main objective of this study was to assess the awareness, knowledge, attitude, and skills of telemedicine among the health professionals working in the teaching hospitals of Puducherry Region of India.

[(2)]A total of 120 volunteers from eight medical colleges took part in this study. Based on the available e-mail database of participants who attended the National Course on Educational Science for Teachers of Health Professionals conducted by the Department of Medical Education since 2007, a request to participate in the survey was sent to the 178 faculties, via e-mail, working in eight medical colleges in Puducherry region. A total of 136 faculties showed willingness to participate in the study. The questionnaire was based to assess the Awareness, Knowledge, Attitude and Skills of the respondents. Finally, 120 questionnaires were received that were complete in all the respects and were taken for analysis as per the study objectives.

The questionnaire was constructed by the authors after a review of the literature pertaining to telemedicine and ICT skills and consultation with professionals with

expertise in the field of telemedicine. The face validity and content validity of the tool was evaluated by an expert panel during and after development to ensure that the respondents had a complete comprehension of the tool used in the study. After establishing the conceptual framework, six purposely chosen experts including a statistician, an educationist, two medical consultants, a communication engineer and two faculty in-charge of telemedicine unit who can contribute to questionnaire design, telemedicine and e-health were asked to review the draft items of questionnaire to ensure it was consistent with the conceptual framework. Each reviewer independently rated the relevance of each item in the questionnaire to the conceptual framework using a 4-point Likert scale (1=not relevant, 2=somewhat relevant, 3=relevant, 4=very relevant). The Content Validity Index (CVI) was used to estimate the validity of the items.

Awareness

Degree	N	%
Low≤49%	14	12
Average≤50-70%	30	25
High≤71-100%	76	63

Table 6:Statistics for the degree of awareness among the faculty

[(2)]The awareness level shows that 12% of the respondents have low level of awareness, 25% have average level of awareness and 63% have high level of awareness.

Knowledge

Degree	N	%
Low≤49%	29	24
Average≤50-70%	42	35
High≤71-100%	49	41

Table 7: Statistics for the degree of knowledge among the faculty

[(2)]The knowledge level shows that 24% of the respondents have low level of knowledge of telemedicine, 35% have moderate level of knowledge and 41% have high level of knowledge of telemedicine.

Attitude

Degree	N	%
Low≤49%	36	30
Average≤50-70%	37	31
High≤71-100%	47	39

Table 7: Statistics for the degree of attitude among the faculty

[2]With respect to the attitude level 30% of the respondents have low level of attitude towards telemedicine, 31% had moderate level of attitude and 39% had high attitude level towards telemedicine.

Skills

Degree	N	%
Low≤49%	67	56
Average≤50-70%	30	25
High≤71-100%	23	19

Table 8 : Statistics for the degree of skills among the faculty

[2]With respect to the skill of telemedicine, 56% don't have adequate skills of telemedicine, 25% possess moderate skills of telemedicine and only 19% have adequate skills of telemedicine.

CASE study 3

A cross sectional study, [1]Awareness and attitudes towards telemedicine among doctors and patients in India (Sushil K Meher, Rajeshwar S Tyagi) was conducted. 143 doctors at 14 different hospitals in India, and from 121 patients participated. .The main objectives of the study was , to study the awareness and opinions of rural patients regarding telemedicine, and to identify the benefits of telemedicine and the barriers to its use were also evaluated.

The questionnaire was given to 143 doctors at 14 different hospitals. Three hospitals were in New Delhi and 11 hospitals were in different states of India (92 doctors were from

Delhi and 51 from other states of India). The questionnaire was also given to 121 patients who had come to New Delhi for treatment from other parts of India.

(1) Only three of the 14 hospitals had not implemented telemedicine. Telemedicine was used by more than half of the doctors. Most doctors were aware of telemedicine technology. A total of 86 doctors had used telemedicine which is of 71 %. Of those 86 doctors, the majority stated that they were willing to cooperate with other centres. About half of the respondents disagreed that their lack of knowledge of telemedicine prevented them from practising it. More than half of doctors disagreed that telemedicine was a waste of time. Three quarters of the doctors agreed that telemedicine should be available at the desktop.

(1) Two-thirds of doctors stated that they would feel uncomfortable in talking to remote doctors. Over half of the doctors felt that a monthly roster for the use of telemedicine would be helpful, so that they could re-schedule their work to make best use of telemedicine. The majority of the 121 respondents (100) were not aware of telemedicine. However, when the concept was explained, most patients had a positive attitude towards telemedicine. 85% respondents answered that they would use telemedicine if it was provided in their town. Almost 68% wanted telemedicine to be implemented in hospitals. 88% who had previously used telemedicine found it satisfactory . Patients were asked how much they would be willing to pay for a teleconsultation if it was available at a hospital near to their residence. Most of the respondents were willing to pay up to Rs.100, but some were willing to pay more that Rs.200 if required.

RECOMMENDATIONS

Recommendation from these studies suggest that, telemedicine should be implemented decisively in tier I, II, III cities as a prelude to popularize this technology all over the nation .Professional credits, financial incentives could be extended for practicing telemedicine which will encourage the practitioners to adopt telemedicine in their career. The current use of e-health tools by Indian physicians does not appear to be widespread. However, Indian doctors are keen to obtain further specific training in the field and are of the view that telemedicine and online learning would be promising tools. In the near future, specific ‘physician-friendly’ training may help Indian doctors to embrace e-health initiatives more widely Telemedicine could be made mandatory during internship and

must be included in the UG and PG curriculum to develop required skills at the grassroot level. Training programmes are the need of the hour to popularize telemedicine. Funding of research to boost quality and lower costs of telehealth programs. While growth of telehealth is moving quickly, it is important that what eventually becomes standard improves patient care and decreases the costs of healthcare practices. Conduct more number of continued medical education programs and effective campaigns by the government to promote telemedicine awareness.

GOVERNMENT INITIATIVES-

Recently NITI AYOG in March 2020 has released the "Guidelines for telemedicine practice" for virtual consultations, which had the following highlights, a patient can now consult doctors over text, video and voice calls.

The doctors will have to complete an online course which will be developed and made available by the Board of Governors in supersession of Medical Council of India, which needs to be completed within three years after which they would be certified and allowed to practice for online consultations.

Going forward, all doctors who provide teleconsultation will have to display their registration number in all communications exchanged with the patient for example, in emails or WhatsApp messages, on prescriptions and on fee receipts. Doctors will also have to be careful while issuing a prescription during teleconsultation.

Before proceeding with the teleconsultation, the doctor should exercise professional judgement to decide whether the teleconsultation is, in fact, appropriate and in the interest of the patient. If the answer is yes, then the doctor should evaluate which medium would be preferred for the teleconsultation.

LIMITATIONS

As any other technology even telemedicine has its own limitations such as it may not be good enough to be used for general follow ups but its application in the diagnosis and treatment of diseases like cancer, heart diseases and other super specialty areas is still not clear.

For the doctors , as a thumb rule, prescribing medicines for chronic diseases (such as asthma, diabetes or hypertension) should be avoided during teleconsultation, unless it is

an add-on or refill of an earlier prescription obtained during an in-person consultation less than six months ago.

If a prescription for chronic diseases is to be issued, then the teleconsultation should be done strictly via video. A prescription can be sent through any electronic medium such as email, WhatsApp etc. as a photo/scan / digital copy of a signed prescription or an e-prescription.

This process depend totally on the internet service providers and poor internet connection can lead to 'possible patient mismanagement.

Some people are more into the 'personal touch' that they experience from the doctor even for any simple check-ups, which can sometimes lead to unsatisfactory results during teleconsultation.

It can be more cost crucial for any organization. As the range works from setting up the department to maintaining the equipment till the recruitment of IT staffs, it takes both time and money for building an effective telemedicine programme in a hospital.

HEALTHCARE STARTUPS: THE FUTURE OF TELEMEDICINE IN INDIA.

In India, several Healthtech start-ups are working towards technological advancements in health. There are more than 150 healthcare-based start-ups in India. Practo outshines as an example offering teleconsultation. Another start-up HD Medical is a medical R&D firm empowering medical practitioners & organisations with perfect products specialising in screening and early detection of cardiac conditions. A medical innovation company, Rijuven India, has introduced smart healthcare with a mission to transform and revolutionize healthcare through innovative medical products and services. In terms of online consultancy, TeleRad provides accurate teleradiology, remote radiology, and radiology outsourcing solutions at very economical costs. Other Start-ups such as MedCords connects doctors, patients and pharmacies for smooth access and sharing of medical data. Live health is an online platform which helps in maintaining the medical health reports and storing them securely for easy access in future for patients and doctors. 5C Network is an online portal providing radiodiagnosis through technology which makes it affordable and easily accessible even when a radiologist is not present. It provides its services to more than 20 lakh users, across Uttar Pradesh, Madhya Pradesh, Gujarat, Bihar, Rajasthan.

CONCLUSION

In a developing country like India, there is a lot of room for such development. With the communication industry evolving at such a rapid pace, telemedicine sector is bound to develop too. Telemedicine by its nature may be associated with a lot of ethical issues. Issues of major concern are related to security and confidentiality of patient data and so appropriate knowledge and training in telemedicine ethics and medico-legal issues in telemedicine would solve this issue. This corroborates with the expressions made by the respondents of various studies.

Telemedicine offers solution for emergency medical assistance, long distance consultation, administration and logistics and supervision, quality assurance and training for health care professionals

Telemedicine needs to be implemented carefully. The impact of telemedicine on the healthcare structures can be significant. In respect, it can be seen as a tool that is being used to build up a new healthcare horizon.

The need of the hour is better dissemination of information using research and development in telemedicine and to intensify training workshops for health professionals and improve telemedicine facilities to reach the unreached.

While Indian Government is trying to achieve the motto of ‘Health for all’, telemedicine is a breakthrough in the healthcare technology assessment. Telemedicine provides an aperture, to strengthen the infrastructure which could prove an asset to achieve a robust healthcare for its citizens.

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ANNEXURES

This article was published by CHD group- A leading organisation working with UN and Government of India. This organisation also works with the Atlantic Council. It was a privilege to publish this article with them. Below is the link for the article,

https://www.chdefforts.org/telemedicine-as-an-effective-strategy-for-india/

A REPORT

BY

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MBA HOSPITAL AND HEALTH MANAGEMENT

2019-2021

REPORT ON INTRODUCTION TO GLOBAL HEALTH

NAME OF THE COURSE: An introduction to Global Health

Hours: 16hours

Credits: Coursera from the University of Copenhagen.

Course Description:

This course provides us with an overview of the most important health challenges the world is facing today. It gives us insights into how challenges have perceived over time and explains us about the determinants of such changes and examine future projections.

LEARNING METHODOLOGY

The course was provided through online lecture videos. It totally comprised of 17 hours carried out for 6 weeks. It consists of 14 modules (2 module per week) and each week was assessed with a quiz. It involved case studies and reading materials which were fully accessible in the course.

KEY LEARNINGS

- What are the biggest health challenges and how each country is striving to overcome it, also how the changing polices of a country help in the health condition of the citizens of the country?
- How communicable diseases from being the major threat to the population is now shifted to the NCD.
- Environment, climate and migrating changes playing a major factor in the lifestyle and health status of the people.
- Importance of maternal health and child health.
- The concept of financing of heath coverages and global health governance.

Modules

Global health: an introduction

- How changing policies impact global health?
- Epidemiological and demographical transition
- Disease-specific risk factors and determinants all of relevance for the changing patterns of global disease burden
- Infectious diseases
- Non communicable diseases
- Sexual and reproduction health
- Migrants and health
- Food and nutrition
- Financing universal health coverage
- Global health governance

Global Health: An Introduction

Global health is defined as "an area of study, research and practice that places a priority on improving health and achieving health equity for all people worldwide". It is also defined as "those health issues that transcend national boundaries and governments and call for actions on the global forces that determine the health of people".

In the past decades, the world has seen significant progress in human health, especially in relation to control of infectious diseases. Life expectancy has increased; fertility rates have dropped, and the quality of life improved for millions.

Despite this significant progress, there are millions of people living in extreme poverty, with lacking the most basic amenities such as water and sanitation. Poverty, malnutrition, infectious diseases, and reproductive health are still some fundamental basic needs that needs to be reached for millions of people.

Some people do not have proper shelter due to wars and conflicts. At the same time, the aging population, urbanization and changing diets are among the driving factors for a non-communicable disease, such as cancer and diabetes.

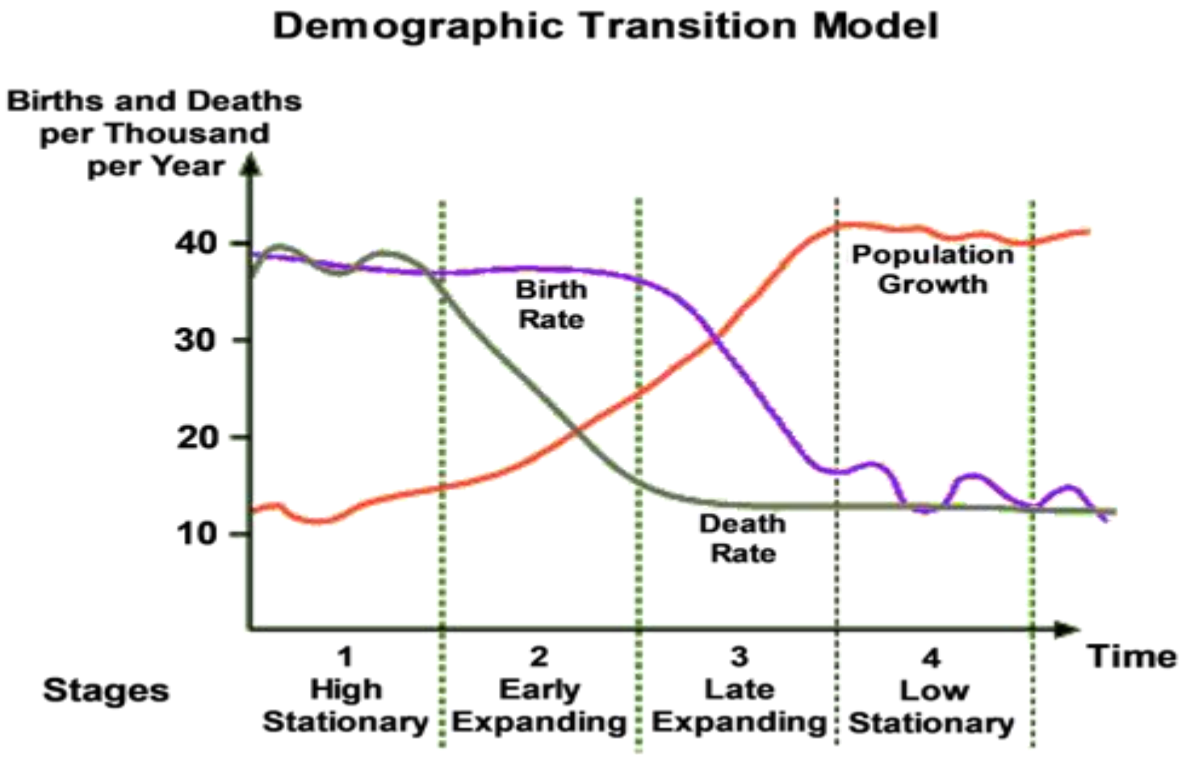
There is an increasing burden of mental health diseases rising due to social networking, domestic violence, drug abuse, trafficking and several other factors which needs an urgent attention from all the sectors to shut the taboos associated with it.

How changing policies impact Global health?

In 1969, Uganda faced several major health delivery issues as delivery of immunization programmes, infectious disease management. The people even had to walk more than 17 kilometres to reach basic amenities of health services. With the continuous support of the government and international agencies there has been a remarkable progress in development of immunization programs. The Ugandan government was only covering 7% of the cost of fighting AIDS. And so, the Uganda government called for donors from all over the world to fight against the deadly disease. And 93% of funding came from donors. So that is an incredible dependence on external funding. It gave people a new hope towards the deadly disease, that first, there were these miraculous returns to health. People who were literally reduced to skin, and bones and rashes in a few months had gained weight and looked healthy and fine. And they got a second chance to live, and biomedicine did that.

Epidemiological and demographical transition:

The disease burdens related to infectious diseases over time is replaced with disease burdens related to non-communicable chronic diseases. This is known as epidemiological transition.



The theory of demographic transition refers to" the historical shift from high birth rates and high infant death rates in societies with minimal technology, education (especially of women) and economic development, to low birth rates and low death rates in societies with advanced technology, education and economic development. This trend is known as demographic transition as a country develops from a preindustrial to an industrialized economic system. Because of modernization, economic development and improved health systems, disease burdens and deaths related to infectious diseases will decline, and more individuals will survive to an older age. So, the disease burden related to infectious diseases will decrease and shift towards to non-communicable diseases.

INFECTIOUS DISEASES:

Infectious disease has been a great factor for the mortality in the early days, with diseases like diarrhoea and malnutrition pertaining in children. tuberculosis and malaria which caused a great death toll in Europe in the 17th century. They were highly related to lack of sanitation and water hygiene practices but there also high mortality for women during and post labour, not only because of bleeding and other obstetric complications, but women also died from childbed fever or puerperal sepsis.

Methods for managing diarrheal diseases.

It is estimated that 58% of diarrheal disease deaths can be ascribed to unsafe water, poor sanitation, and hygiene. Rotavirus and vibrio cholerae were considered as the major etiological agents prior to the development of the vaccine in 1998, rotavirus being one of the major causes of deaths in children around the world with almost 2,15,000 deaths annually. Rotavirus spreads very fast among infants and young children. The virus can cause severe watery diarrhoea, vomiting, fever, and abdominal pain. Children who get rotavirus disease can become dehydrated easily and may need to be hospitalized immediately. In recent development, Vaccines for rotavirus have shown an efficacy of 78%. For example, in the USA, a measurable decrease was seen in the number of rotavirus gastroenteritis hospitalizations accompanied by a suggested herd effect protecting older non-vaccinated children, while in Mexico a decline of up to 50% in diarrhoeal deaths in children under 5 years of age was attributed directly to the use of the vaccine.

An infestation with vibrio cholerae bacteria leads to the disease cholera. Most cholera cases are reported from Africa, Southeast Asia, and Haiti. The treatment for infection with cholera involves rehydration with oral rehydration solutions or IV, and the administration of antibiotics such as Doxycycline and Azithromycin. Risk of infection with cholera can be significantly reduced by improving sanitation and hygiene measures at both personal and community levels.

NON COMMUNICABLES DISEASES

NCDs are a group is diseases that “share common risk factors, common causes and determinants and therefore share opportunities for mitigation and prevention”.

There are four major diseases with four modifiable risk factors. The four diseases are diabetes, heart disease, cancer and respiratory diseases, chronic lung diseases. The risk factors are tobacco use, unhealthy diet, physical inactivity, and the harmful use of alcohol respectively.

NCDs cause more deaths than HIV, TB, malaria, and all other diseases combined. NCDs are not diseases of the rich. In fact, the vast majority of NCDs occur in the world's poorest populations. That is, low- and middle-income countries, but in addition, it's important to remember that even in high income countries, there is a link between poverty and NCDs.

we know that 80% of diabetes and heart disease and a third of cancers can in fact be prevented today with the tools, knowledge, and opportunities that we currently possess.

Determinants and Drivers of NCDs

The social determinants of health are the conditions in which people are born. Poverty is almost universally linked to higher rates of smoking, alcohol consumption and in most regions, obesity and NCDs themselves. Lack of education lead to a lack of understanding around how to avoid NCDs, what to eat and how to access treatments.

80% of NCDs can be prevented through primary prevention. By modifying risk factors and behaviours, such as reducing tobacco consumption, fat, alcohol, and salt intake, they can be prevented. Promoting physical activity and improving environmental conditions such as air quality and urban planning holds a positive effect on health.

SEXUAL AND REPRODUCTION RIGHTS

Rights activists had been advocating for decades that women and men should have access to contraception. In developing countries, only about 10% of women were using modern contraception in the back 1960s.Finally in 1968, The Human Rights Conference in Tehran declared that it was a human right for men and women to be able to decide on the number of their children.

In 2004, the World Health Organization Health Assembly adopted a strategy which included five priority areas of this broad approach of reproductive healthcare. First is improving antenatal, delivery, postpartum and new-born care. Second, is providing high-quality services for family planning, including infertility services. Third is eliminating unsafe abortion. fourth, is combating sexually transmitted infections including HIV, reproductive tract infections, cervical cancers, and other gynaecological morbidities. Fifth is promoting sexual health. The 2015 Global Strategy for Women's and Children's and Adolescent's Health built on these components. So altogether we have come a long way in developing a practical and concrete consensus on many areas of sexual and reproductive health and rights, which are supported by universal human rights and frameworks.

ENVIRONMENTAL HEALTH AND CHALLENGES

Environmental health comprises of those aspects of human health, including quality of life. That are determined by physical, chemical, biological, social, and psychosocial factors in the environment. It also refers to the theory and "practice of assessing, correcting, controlling, preventing those factors in the environment that can potentially affect the health of present and future generations".

THE MODERN HAZARDS ASSOCIATED WITH UNSUSTAINABLE DEVELOPMENT.

- Poor quality water, insufficient access to water, lack of appropriate sanitation and poor personal hygiene. Especially the insufficient hand washing with soap, among the essential environmental factors impacting human health. And several other water and hygiene related problems. In addition, lack of access to basic sanitation, insufficient water supply also plays a wide role in healthcare.
- Air quality is an alarming concern. Air pollution during transportation and workplace contributes to more than 68% of hazardous risk factors. Cooking and heating with solid fuels and open fires or traditional stoves, in often poorly ventilated rooms, result in high levels of indoor health damaging air pollutants.
- Rapidly unplanned and unsustainable patterns of urban development are making developing cities focal points for emerging environmental hazards. This includes solid waste disposal, wastewater management, provision of safe water, sanitation, noise.

  Shrinking forest cover, unsustainable production system, climate change, and poor management of natural resources significantly impact on livelihood, food security, migration patterns, and of course human health.

At national and local level, countries have established departments and programs to address environmental health challenges. But many such programs are significantly under resourced due to weak policy frameworks, poor implementation strategies.

MIGRATION AND REFUGEES

" Human migration is the movement of people from one place to another with the intentions of settling, permanently or temporarily, at a new location (geographic region)".There are many of reasons that the health situation of displaced populations is of

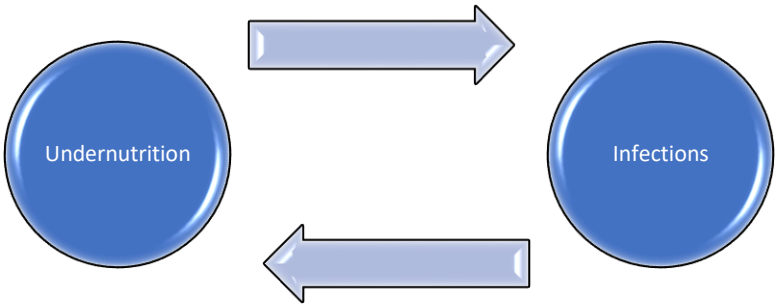
particular concern. Poor housing, lack of access to food, water and sanitation, crowding, exhaustion, loss of protective structures, language barriers and violence.
The 1951 Refugee Convention states that refugees should enjoy access to health services equivalent to that of the host population. Displacement is often related to what is sometimes called fragile states. The World Bank estimates that about 1.5 billion people are living in situations which may be called fragile situations. And implicit in this definition is that health systems have broken down or are not reaching parts of the population.

MIGRANTS AND HEALTH

In recent decades, the proportion of international migrants who migrate from less developed to more developed regions, have increased with an average of 35 % throughout the world. These migrants are usually with the median age 39 and their major health concern is reproductive health. Host countries are worried about the presence of infectious diseases in migrants, and screening of migrants (though a contentious human rights issue) has been adopted, to varying degrees, by several countries throughout the world. While some migrants may be generally healthier than the population, other migrants may have pre-existing health conditions that can strain local health care systems. For example, increasing retirement migration (where older adults, who often require more health care, migrate to warmer destinations - e.g. Spain, Florida), can present a challenge for recipient health care systems. when considering the health of migrants, it is very important to recognize the great differences which exist among the different groups of migrants. And this is also reflected in their health conditions as well as in the possibilities which we must address their health.

FOOD AND NUTRITION

Under nutrition and infections are common in low income settings and usually coexist. This coexistence is part, is partly due to poverty being a determinant of both. But it is also reflecting a causal bidirectional relationship, that undernutrition may lead to infections, and infections to undernutrition.



Several million children die each year due to undernutrition. Most of them dont die from infections. But they die from these trivial infections because of underlying undernutrition. Infections impair nutritional status through reduced appetite and reduced absorption of nutrients, as well as increased utilization and excretion of nutrients.

On the other hand, undernutrition increases the risk and severity of infections by impairing the immune system. First, the starch rich maize requires a lot of water to be added to reduce its viscosity. Second, maize contains so called anti nutrients which will prevent the absorption of important minerals like iron, zinc, and phosphorus. So even with access to enough foods, the intake of energy and micronutrients may be inadequate to maintain micronutrient stores and to maintain growth in children, and weight in adults. Consequently, people will have micro- nutrient deficiencies.

Micronutrient supplementation is basically unphysiological. It typically provides a single nutrient in a very high dose, and not embedded in a food matrix. Given to individuals who are deficient in a whole range of nutrients and energy, an undernourished body may be overwhelmed and unable to handle the nutrients effectively and safely.

Thus, when these nutrients are given to any undernutrition person who is affected with any infectious disease, consequently, the nutrient may benefit the pathogen rather than the host. The result is that the patients will not recover functionally in terms of physical activity in working capacity and immunity. We need quality supplements that match the nutritional requirements, support regain of the tissues that have been lost, and optimize functional recovery. Ideally, we need a supplement with effects on a range of infection's specific and general outcomes.

FINANCING UNIVERSAL HEALTH COVERAGE

UHC is the strategy to ensure that all people obtain the health services that they need without suffering financial hardship when they pay for them.

UHC is getting increasing global attention strongly promoted by the WHO, and the strategy is a corner stone of the global post 2015 agenda for health.

With our adoption of the sustainable development goals in September 2015 UHC became a separate target under goal 3 to ensure healthy lives, and promote well-being for all. Currently, 1.3 billion people in the world extremely poor do not have an access to effective and affordable diagnostics, drugs, surgeries, and other health services, and WHO has estimated that about 100 million people are driven below the poverty line every year because of out of pocket payments for health services.

To address these global inequities, the UHC must address three distinct challenges. First, is ensuring that all people can get the health services they need.

Second, ensuring that services are of sufficient quality to be effective, and third, ensuring that the use of these services does not expose the user to financial hardship.

A typical Low-Income Country, for example Tanzania, collects about 12% of GDP in tax which amounts to 80 US $per capita per year. The government of Tanzania must finance all of its excess from the 80US$ leaving only limited public funds for health. On average, high income countries have a tax revenue as a percentage of GDP of around 22%. The second strategy is to raise more revenues for health by budget allocations. The third strategy is to implement sin taxes. Sin taxes are taxes specifically levied on certain goods deemed harmful to the society. For example, alcohol and tobacco.

Sin taxes are used to increase the price of these goods to reduce their use and related negative affect on public health. The fourth and last broad strategy is to advocate for more development assistance for health.

GLOBAL HEALTH GOVERNANCE

Epidemics have spread across the globe for hundreds of years and nations have historically established measures to protect themselves from such threats. Quarantine approach are one such measure. At the strategic level, the Millennium Development Goals known as the MDGs which reformulated in 2001 and revised in 2007 arguably one of the most powerful shared global sets of development goals which the world has ever seen.

Global Health Governance plays a concern in managing the solutions to global health challenges. At the national level, governments play a central role, by adopting and implementing laws, collecting taxes, undertaking programs and implementing them.

At the global level, although intergovernmental organizations, such as the United Nations play an important role. A great deal relies on consensus processes such as establishing the sustainable development goals. A few legally binding conventions such as the tobacco convention. Technical standards such as the international system for the classification of disease. And obligations to act, such as for the international health regulations.
Then, there also various volunteer codes of conduct. As well, as guidelines, concerning the intellectual property related to the pharmaceuticals. There are many challenges in this complex government's framework. One is sovereignty, the global government system of the United Nations is built up around the principle of the sovereignty of nations. Establishing legally binding or more informal mechanisms which could be infringing on that sovereignty can be quite problematic. Another challenge is accountability. For WHO, its governance is composed of member state governments, which arguably have some accountability to their populations. Some of the new health initiatives have very inclusive governance structure including, for example, civil society organizations, inter-governmental panels, and non- profit organisations.

CONCLUSION.

The world community is finding better ways to confront major health threats. WHO proposes new guidance and promotes cooperation between developed and developing countries on emerging health issues of global importance through which they believe the economically better doing countries can help the developing countries to achieve the concept of “health for all”.

The ever-growing list of global health issues can be overwhelming, but we should not lose hope. There are motivated, passionate, and intelligent individuals and organizations working toward solutions to build on the idea that every individual and every voice matters in the advancement of global health. “Everyone can make a difference. Small contributions quickly add up if enough people take up the cause,” Macpherson asserts. As which each step we take can reflect to better healthy world we wish to see tomorrow.