Summer Internship

At

IIHMR, Delhi (April 1 to May 31st, 2020)

A Report on

PRIVACY RISK IN TELEMEDICINE APPS AVAILABLE IN INDIAN MARKET: CONTENT ANALYSIS OF PRIVACY POLICIES

By

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PG/19/043

Post-graduate Diploma in Hospital and Health Management

2019-2021

IIHMR DELHI

Completion of Summer Internship from IIHMR, Delhi

DECLARATION

I **Dr Manpreet Kaur**, hereby declare that this Internship Assignments entitled **Tata Trusts –Organization Profile, Swastha Bharat Prerak Program, Comparative Analysis Of Help-Seeking Behavior for Depression in Adolescents, Privacy Risk in Telemedicine Apps Available in Indian Market: Content Analysis Of Privacy Policies** is the outcome of my own study undertaken under the guidance of **Prof Dr Nishikant Bele**, IIHMR-New Delhi. It has not previously formed the basis for the award of any degree, diploma, or certificate of this Institute or of any other institute or university. I have duly acknowledged all the sources used by me in the preparation of this field internship report.

Date: 14/7/2020

Sign: Dr. Manpreet Kaur

Postgraduate Diploma in Hospital and Health Management

International Institute of Health Management Research

New Delhi

CERTIFICATE OF COMPLETION

The certificate is awarded to

Dr Manpreet Kaur (PG/19/043)

In recognition of having successfully completed her/ his Internship in the

IIHMR, Delhi

And has successfully completed her Project on Privacy Risk in Telemedicine Apps Available in Indian Market: Content Analysis of Privacy Policies

Date 14/7/2020

IIHMR, Delhi

She has found to be a committed, sincere and diligent student who has a strong drive & zeal for learning.

We wish him/her all the best for future endeavors

Dean- Academics & Student Affairs **Dr Pradeep Panda**

Certificate of Approval

The following Summer Internship Project titled **Privacy Risk In Telemedicine Apps Available In Indian Market: Content Analysis Of Privacy Policies** at **IIHMR, Delhi** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the report only for the purpose it is submitted.

Dr Nishikant Bele

Associate Professor

IIHMR, Delhi

ACKNOWLEDGEMENT

I pay my sincere thanks and a deep sense of gratitude to my Mentor, **Associate Professor Dr. Nishikant Bele** whose valuable guidance, kind supervision, suggestions, and encouragement led to the successful completion of the project.

I'm highly indebted to talented **Faculty at IIHMR, Delhi**, for their help in project presentation and critical appraisal, which further encouraged me to improve my project.

Lastly, But not least, my **parents** are also an essential inspiration for me. So, with due regards, I express my gratitude to them.

Dr Manpreet Kaur

PG/19/043

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Abbreviation

NCD: Non communicable Disease

SF-36: 36-Item Short Form Survey

WHO: World Health Organization

CASP-19: Control, Autonomy, Self-realization, and Pleasure – 19

POSHAN: Prime Minister's Overreaching Scheme for Holistic Nourishment

ICDS: Integrated Child Development Services

UNICEF: United Nations International Children's Emergency Fund

ILA: Incremental Learning approach

OS: Operating System

ORGANIZATION PROFILE – TATA TRUSTS

TATA TRUSTS

Tata Trusts is one of India's oldest philanthropic institutions serving diverse areas of community development. Following its establishment, Tata Trusts has performed a pivotal role in transforming conventional notions of philanthropy to building a powerful sustainable difference in the lives of the communities it serves. The Trusts promote and propel innovation in the spheres of education, nutrition and healthcare, agrarian livelihoods, management of natural resources, improving civil society and governance and communications, arts, crafts, and culture by the direct implementation, co-partnership approaches, and grant-making. The Founder of trust Jamsetji Tata's beliefs and foresight guides trust on the pathway of effective philanthropy and support the Trust's work to expedite societal advancement while also securing that actions and interventions have a significance to the nation.

The mission began when The Sir Ratan Tata Trust, was founded in 1918. It strives to advance the growth of education, learning, and industry. In 1932, The Sir Dorabji Tata Trust was instituted. The Trust is distinguished for nurturing institutions of national significance. The allied trusts of the Sir Dorabji Tata Trust comprises the RD Tata Trust, the Tata Education Trust, the Jamsetji Tata Trust, the JRD Tata Trust, the JRD Tata and Thelma Tata Trust, Tata Social Welfare Trust, the JN Tata Endowment, the Lady Meherbai Tata Memorial Trust, and the Lady Meherbai Tata Education Trust. In 1990 The Tata Social Welfare Trust and the Tata Education Trust were established. The Trusts' trustees chiefly belong to the family, although few executives are also elected.

Trust has more than 75% stake in Tata Sons, the holding company of Tata group. Rest originates from their lawful ventures.

GUIDING VISION:

"What advances a nation or a community is not so much to prop up its weakest and most helpless members but to lift up the best and the most gifted, so as to make them of the greatest service to the country."

MISSION:

By 2021, impact 100 million lives.

Value levers:

A. Pioneering
B. Nation Building

THE TATA TRUSTS APPROACH

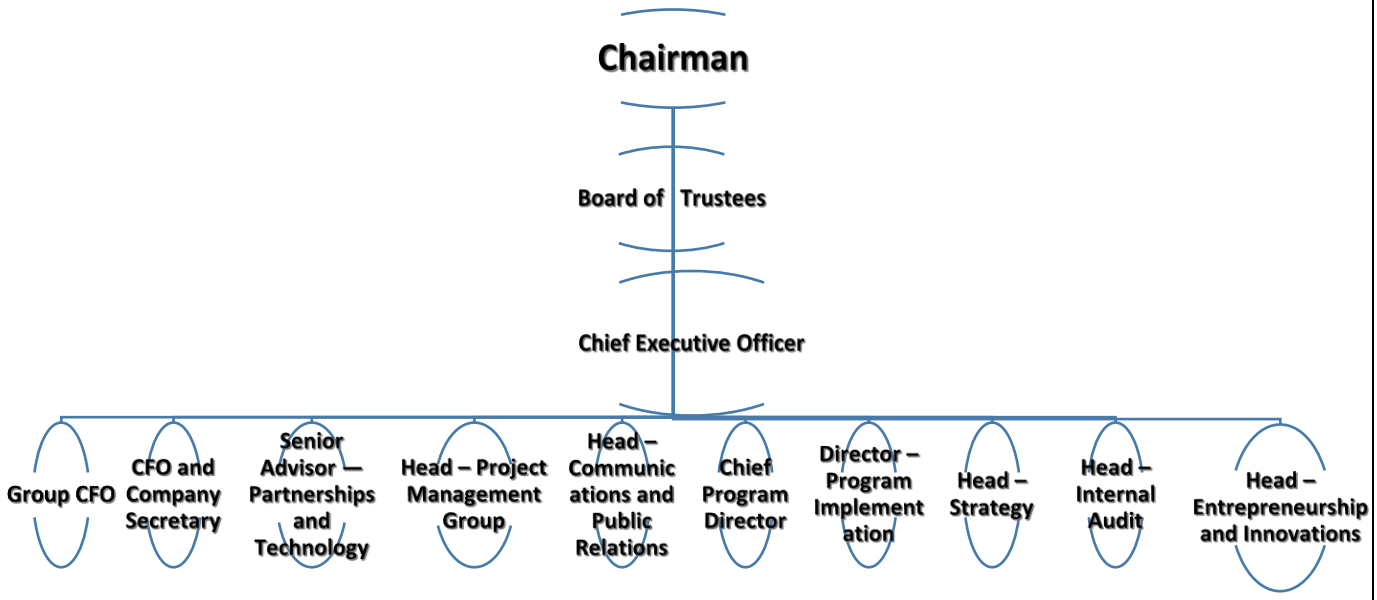
Yellow card approach

A five-point strategy trust would endeavor to include in supported commitments to transform the lives of people. The guidelines are :

A. Scale
B. Measurable impact
C. Finite exit route
D. Sustainability
E. Adoption and contextual application of the best way to doing things globally

Trust is also moving from only grant-making focused organization to implementation by employing technology and innovative solutions.

The organization structure of the trust is illustrated below



Ratan N Tata,chairman of Tata Trusts, leads trust with a vision to enable, empower and transform communities across India.

The Tata Trusts, under his leadership and guidance, have changed from being reactive foundations to one of the India's important charitable foundations. It attempts to change the lives of millions of people, through significant partnerships with non-profit institutions, communities, state and central government, corporates, and internationally funded bodies.

Board of Trustees oversee the overall management of the nonprofit organization and act in the trust's best interests. The managing trustee is R Venkatraman and the number of trustees is 20 altogether.

Tata Trust believes in supporting an open, flexible, engaging, synergetic and meritocratic work culture. It values and empower people with responsibility, freedom, and strength to envisage and change the future. The diversity of work at Tata Trust establishes a quality platform for shared learning and quality exposure, especially it terms of sourcing the best in matters of technology, consultancy and partnerships with international agencies and local NGOs. Career at Tata Trust creates a sense of fulfilment by the maintain balance between personal and professional goals – the former having a ripple effect on the latter. They reckon the

It promises fathomless satisfaction by promising work that makes a positive difference in the lives of others.

Tata Trust communicates with stakeholders and beneficiaries through timely press releases and publications. It has social media presence via Facebook, Twitter, Instagram and Youtube. Tata Trust website publishes the change maker's stories highlighting the impact of quality work trust is doing across various development sectors. Annual and financial reports are released yearly on official website. Tata Trust publishes In-house magazine called Horizons.

The team at Tata Trusts is stimulated, challenged and prepared every day to take on and therefore thrive by addressing real life challenges –from area of water & sanitation, health care, education, livelihoods, sustainability or any other aspect of human, infrastructure or economic development.

Trust supports individuals, government bodies, private sector organizations and international organizations to create a sustainable eco-system that collectively works across following areas:

a) **Healthcare**
b) **Nutrition**
c) **Water, Sanitation and Hygiene**
d) **Livelihood**
e) **Education**
f) **Digital Transformation**
g) **Environment and Energy**
h) **Sports**
i) **Skill Development**
j) **Migration & Urban Habitat**
k) **Social Justice & Inclusion**
l) **Arts & Culture**
m) **Disaster Relief and Rehabilitation**

Through co-partnership strategies, grant-making and direct implementation Tata Trust deploys valuable resources viz. grants, innovative solutions towards a broad spectrum of development programs throughout the country. Across Healthcare and nutrition sector it aims to address various challenges by building a healthy nation where patient centric, affordable and quality healthcare is accessible to all and grave impact of hunger and malnourishment is minimum.

Themes in healthcare portfolio are:

a) **Cancer care**
b) **Non Communicable disease**
c) **Communicable disease**
d) **Elder Care**
e) **Mental Health**
f) **Reproductive, Maternal, Neonatal, Child and Adolescent Healthcare**
g) **Health System Strengthening**

Themes in Nutrition Portfolio

a) **System Strengthening**
b) **Fortification**
c) **Policy and Advocacy**

Tata Trust strives to break the boundaries through its innovative projects and path breaking initiatives. Few of them are mentioned below:

a) Digital Record Keeping: at Urban Primary Health Centre (UPHC) in Nagpur the entire value chain for patient is made paperless.
b) MMU-TMU(Tele Medicine Unit) model for NCD management: MMUs go from village to village for screening common NCDs and patients are referred to nearest TMU for regular follow-up treatment
c) Monitoring the health status of elderly population at Odisha's spoke center as per WHO recommended SF-36 questionnaire. Appropriate actions are recommended based on their score.
d) Monitoring the wellbeing and happiness of elderly population across 4 parameters using CASP-19 questionnaire at spoke center.
e) Patient Advisory groups modeled on the award-winning Patient Reference Group from King's College, UK. India's very first Patient Advisory Group (PAG) in Assam was introduced in October 2018. The aim of the PAG is to get direct advice, feedback and inputs from patients, survivors and caregivers on all aspects of the patient's cancer journey .This allow program members to bring about a difference and implement solutions for the patient.
f) Deployment of Swasth Bharat Preraks or catalysts of change to support implementation of POSHAN abhiyan at Centre, state and district levels and for strengthening the ICDS delivery system
g) To reduce micronutrient deficiency in population and to ensure holistic promotion of fortification trust has set up the Food Fortification Resource Centre.

With Headquarters in Mumbai, Tata Trust influence of work is spread across 638 districts of 33 states and Union Territories. In North India principal focus is on public health, migration, education, livelihoods, Strengthening the Green Revolution, water security, and dairy management. While in West India trust focuses on digital literacy, skill development, education, livelihoods, health care, crafts, sanitation, and migration. In South India, improving agriculture, health, agriculture, sanitation, nutrition, digital literacy, and education. In East India tourism, sports, handloom cottage industry, crafts, and education. It partners with more than 800 organizations for different purposes and impacts millions of households.

With global partners Tata Trust implement best practices in development of communities across the nation. Few of these global partners includes MIT, The University of Chicago, The Global Fund and many more

Impact of Tata Trusts touches millions of homes in India with nearly 900 schemes being completed through 450 partners.

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SWASTH BHARAT PRERAK PROGRAM

Tata Trusts &

Ministry of Women and Child Development

OVERVIEW:

Despite achieving tremendous economic and social growth, worlds remain home to a high number of malnourished people. Globally, it is estimated that 9 million children are wasted whereas around 17 million are severely wasted. Also, 45% of deaths under the age of five is due to malnourishment, predominantly occurring in low and middle income countries of the world. According to different national and international surveys and reports, India's performance remains poor on key malnutrition indicators. According to UNICEF, malnutrition in India caused 69 percent mortality in below five age group whereas 35 percent is stunted and 17 percent wasted (UNICEF, 2019). In below five age group category, every second child is affected by some form of malnutrition.

Over the years various government initiatives are launched which target to enhance the nutrition status within the country. These are the Integrated Child Development Services (ICDS), the Janani Suraksha Yojana, the National Health Mission, the Mid-Day Meal Scheme , the Matritva Sahyog Yojana, , and the National Food Security Mission, among others (Rao, 2017). In 2017, Government of India launched Prime Minister's Overreaching Scheme for Holistic Nourishment (POSHAN) Abhiyaan to address the problem of malnutrition and adopted life-cycle and result-oriented approach for better outcomes. POSHAN Abhiyan's goal is to improve in the nutritional condition of children, adolescent girls, women who are pregnant and nursing mothers within 3 years. To supplement POSHAN Abhiyaan Swasth Bharat Prerak Program was launched in 2018 which is a collaboration of Tata trust with Ministry of Women & Child Development. Program support state plus district administration involved in the implementation of Abhiyaan.

SWASTH BHARAT PRERAK PROGRAMME

In January 2018, Tata Trusts and the Ministry of Women & Child Development (WCD) together launched The Swasth Bharat Prerak (SBP) program. This program is modeled on the Zila Swachh Bharat Prerak program, a collaboration between Tata Trusts and Ministry of Drinking Water and Sanitation that has aided in the success of the country's sanitation goal. It extends support to various components of Prime Minister's Overreaching Scheme for Holistic Nourishment Abhiyaan, path-breaking mission of WCD (Ministry of Women & Child Development.

Its aim is to strengthen the capacity of districts by providing the technical and management tools as they work towards achieving nutrition goals laid down by the Abhiyaan

OBJECTIVES:

Efficient resource – Providing services at the level of districts through Preraks, who operate as both a synergist to successfully implement Abhiyaan features.

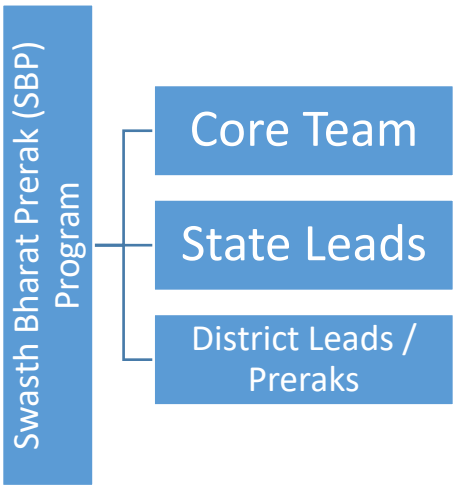
Support – to provide the necessary support to the district officials to remove gaps in crucial nutrition projects and schemes.

Opportunity – To provide lifetime opportunities to young men and women in nation-building.

PROGRAM STRUCTURE

Swasth Bharat Prerak (SBP) Program has 3 tier structure:

Core Team
State Leads
District Leads / Prerak.



IMPLEMENTATION:

The Core team works at the top level and it includes Program director, Program officer, and Program assistant. This team works in synergy with the Central Project Management Unit (CPMU) for the efficient implementation of POSHAN Abhiyaan. Technical as well as managerial assistance is provided to state and district leads supporting Project Management Units (PMUs), district administration as well as ICDS.

State Leads work hand-in-hand with State Project Management Units (SPMU) for Poshan Abhiyaan and support state officials with technical and managerial support. State Leads aid and support District Leads and ensure periodic reports.

District Lead/ Prerak coordinate with the administration at District Level and ensure implementation of various components of POSHAN Abhiyaan which are mainly – Convergence, ILA, ICDS-CAS, Innovation, and Jan Andolan. Preraks document and reports in a timely manner to appropriate authorities.

ROLES AND RESPONSIBILITIES OF PRERAKS

It involves – analysis, report and intervene through appropriate channels. Data and numbers that are received every month are analyzed to see whether the program is working. A comprehensive

report is prepared by Preraks on program delivery, gaps, and failures. They also identify the bottlenecks and report it to relevant authorities so that the program works efficiently and according to design.

Preraks formulate and test hypotheses and techniques and present results to senior bureaucrats and implement appropriate recommendations in collaboration with officials at District and Block Level.

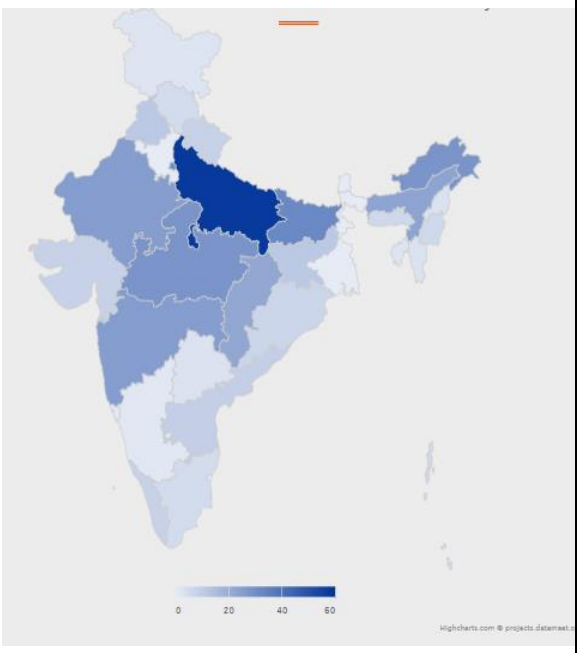
Preraks on a daily basis interact with the wider community including women and children, anganwadi (or childcare) workers, officials, and village councils.

The Prerak join the District Magistrate/Collector office and assign to work in teams to manage and implement the Poshan Abhiyaan (National Nutrition Mission) in the District.

At the District and State Level the Prerak work in teams contributing in all aspects of Government engagement to enhance the nutrition status of the district and thus contributing to the larger vision of a healthy India

COVERAGE:

Across India, 333 committed young men and women are pushing India's nutrition goal towards success. Driven by enthusiasm and vision of healthier India, they are making a difference to the lives and future of millions. They are making change happen. Innovation and 'can do and will do' are their mantras. They are Swasth Bharat Preraks, working at the grassroots level with local administration and community. Preraks are playing a big role in accelerating the impact of POSHAN Abhiyan. Presently, Preraks have been spread throughout 36 states and union territories of India including 78 aspirational districts.

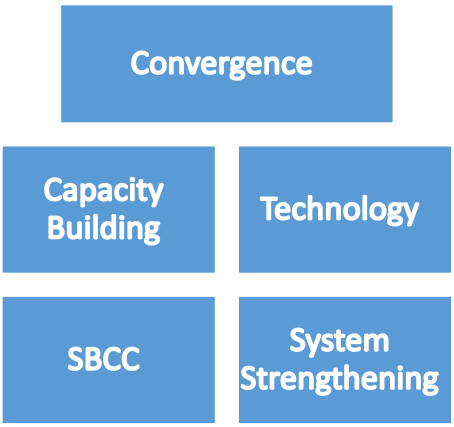


IMPACT:

Impact of Swasth Bharat Prerak (SBP) Program span across Convergence, capacity building, technology deployment, SBCC and system strengthening.

Convergence:

POSHAN Abhiyaan adopts a comprehensive approach of converging related programs and schemes to ensure effective service delivery, monitoring, and timely interventions. Swasth Bharat Prerak (SBP) Program through Preraks supports convergence as they have the advantage of not being confined to any particular department. This helps in breaking silos and bring about convergence at various levels.



Capacity Building:

Capacity Building is one of the crucial components of POSHAN Abhiyaan. It ensures effective delivery of nutrition related services. Preraks in cognizant of this need ensures implementation of training in accordance with the mandate of Poshan Abhiyaan. Also, Preraks continuously identify the need for training of functionaries posted at the front line. This ensures streamline of service delivery and brings greater awareness for improved nutrition, sanitation, and health.

Technology application:

POSHAN Abhiyaan recognizes the advantage of the appropriate use of technology to address previous challenges encountered during the implementation of different nutrition related programs and schemes. Usage of CAS (Common Application Software) helps in strengthen service delivery and enables monitoring of services in real time. All frontline functionaries associated with Abhiyaan are provided smartphones and trained for monitoring the services with technology. Preraks play important role in the deployment of CAS. They also identify and implement viable technology solutions to address gaps across nutrition service delivery.

Social and behavior change communication:

The success rate of any program depends on the extent of the behavior and attitude of the intended recipient changed. POSHAN Abhiyaan incorporated SBCC as a crucial component and thereby tries to alter the attitude of people and bring greater awareness about importance of health, hygiene, and nutrition. The Preraks acts as agent of change by influencing local leaders and frontline workers. They also make sure awareness creation and social change goals are met as set by POSHAN Abhiyan.

System strengthening:

Preraks extend support to the District office by identifying areas where improvement is needed in nutrition related programs. They also support district and local officials in implementing mitigation strategies. The overall goal is to make a clear difference in the quality of services.

KEY ACHIEVEMENTS:

POSHAN Maah or the National Nutrition month – The Preraks promoted the project '4 Hafte 4 Charche' unveiled during the POSHAN Maah. The initiative presented important appeals to all the participants including teenage girls, local leaders, and lactating mothers by over 200 Preraks on ground.

Jan Andolan at Kumbh Mela report – In Uttar Pradesh the Preraks used the Kumbh Mela as a platform to educate people about relevance of nutrition. Within 24 hours Preraks coordinated 100 nukkad nataks in 24 hours.

First anniversary celebrations of POSHAN Abhiyaan – Preraks at large scale participated and successfully demonstrated communication and behavior-change activities. More than 2500 activities were directly facilitated by the Preraks over various districts. These included the Poshan mela, cycle and Poshan rallies, school-based activities, awareness campaigns for adolescent girls, youth group meetings, haat bazaar activities, prabhat pherees and many more (Trust, 2019). A unit of Preraks created material for the Ministry of Women & Child Development's social media accounts such as Facebook and Twitter, and successfully achieved over five lakh mentions for #PoshanPakhwad

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COMPARITIVE ANALYSIS OF HELP-SEEKING BEHAVIOUR FOR DEPRESSION IN ADOLOSCENTS

INTRODUCTION:

Worldwide, every sixth individual is aged between 10 - 19 years old. Mental health problems account for 16% of global burden of illness and disability in people 10-19 years of age. Adolescents is a special period, a period of development. Various bodily, psychological and social changes can make adolescents susceptible to mental health issues. Protecting them from adverse experiences and promoting psychological well-being is critical for their optimum physical and mental health in adulthood. In adolescents, the high vulnerability to developing mental illness is combined with avoidance to seek medical assistance. There are several explanations for understanding why adolescents in the general population are not seeking medical assistance for serious mental illnesses such as depression. To better understand the behavior of not seeking professional help amongst adolescents across the world, a comparative study is undertaken. This study compares various barriers to help-seeking for depression amongst adolescents by contrasting their attitude towards sources of help and barriers to help-seeking.

OBJECTIVE: To compare help-seeking attitude in school going adolescents for depression.

METHODOLOGY:

Eligibility criteria:

Inclusion criteria: Publication between 1st January, 2009 and 31st December 2019 in English language. There was no clear criteria for geographic representation and goal was to incorporate studies from all parts of the world. Age criteria restricted for participants between the ages of 10 and 19 years. Articles reporting help-seeking attitude for depression included. All the qualitative studies and research articles which did not mention the variable of significance were not considered. In this comparative study, articles not yet published are excluded.

Search strategy for identification of studies:

4 databases were searched, namely PubMed, Medline, Science Direct; and Google Scholar, for selecting studies on help-seeking attitude in adolescents for depression. In each database a Boolean search was carried out using the search terms: adolescence, attitude to mental health, and depression. The concept of adolescent was broadened with MeSH words: “Adolescence” OR “Minors” or “Teen” OR “Youth”

The behavior of help-seeking was broadened with MeSH words: “Attitude” OR “Seeking Help” OR “Attitude to Health”.

The concept of Depression was broadened with MeSH words; “Depressive Disorder” OR “Depressive state” OR “Symptom of Depression”.

Study selection:

For this comparative study, names ,abstracts and full texts were filtered to exclude studies that did not meet the required criteria .Further the significance of papers were checked in detail.s

Data extraction:

Following information extracted: country, year of publication, setting characteristics and method of data collection. Further variables were classified into following 2 components: Barriers towards sources of help and barriers to seeking help and on the basis of which data for variable is extracted.

KEYWORDS: Adolescent, Depression, Help-seeking, personal barrier

COMPARISON:

Author	Study Design	Place of Study	Sample Size	Variables	Tools used to measure outcome	Outcomes [Help-seeking attitude]	
						Preferred Source of Help	Barriers to seeking help
(D. I. Lubman, 16 August 2017)	Cross Sectional	Australia	2456	Attitudes towards help sources, Attitude towards obstacles to finding support.	Vignette-based questions, GHSQ-V, BASH-B	Father, mother ,school counsellor, relative or family member, Mental health professional outside of school, telephonic help line, teacher, doctor, friend.	Self-support (prefer solving own problem by himself/herself), Embarrassment (too embarrassed to Speak with counsellor, not wanting family to learn about problem)

(Cecilia Olivaria, 2017)	Cross Sectional	Chile	793	Attitudes towards help sources	GHSQ-V	Father or mother (highest mean score), friend, boyfriend and girlfriend.	
(Lam, 2014)	Cross Sectional	China	1678	Attitudes towards help sources, Attitude towards obstacles to finding support.	MHL and stigma Questionnaire	Both parents (57.1%), other people.	Perception that other people might feel negatively towards you (29%), too Embarrassed or shy (29%), what the person might say is wrong
(Malvika Sharma, 2017)	Cross Sectional	India	354	Attitudes towards help sources, Attitude towards obstacles to finding support.	MHL and stigma Questionnaire	Psychologist/counsellor (25–30%) family/friends 21.5%	Embarassed or feel anxious about asking for support (40–45%), don't know where to go for help. (19%)
(Kennedy, 2010)	Cross Sectional	United States	281	Attitudes towards help sources.	MHL Survey	School counsellor(83%), nurse, family doctor, psychiatrist	

RESULTS:

Two important types of help sources – informal and formal are analyzed in selected research articles. Informal sources of help such as family and friends preferred by adolescents for mental health problems such as depression. Among formal sources of help counselors are most preferred. Adolescents experienced many attitudinal obstacles to seeking assistance such as feeling humiliated, nervous or embarrassed, attempting to cope with the issue by themselves, concerned about other negative attitude of others. In United States due to easy accessibility to a counsellor in school majority of adolescents preferred formal help.

OUTCOME

Among adolescents stigma exist for seeking support and help for issues of such as depression. There is a need to address mental health issues and raise awareness among adolescents about alternative ways to seek support through community programs and tailored school-based

programs. Approaches targeting adolescents and other actors including parents and teachers could be successful in long run in reducing the effect of mental health issues.

Improving the degree of mental health awareness can be seen as an significant preventive tool for young people's mental health issues.

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PRIVACY RISK IN TELEMEDICINE APPS AVAILABLE IN INDIAN MARKET:

CONTENT ANALYSIS OF PRIVACY POLICIES

ABSTRACT

Background: The rise in the usage of mobile-based telemedicine services enabled the patients to access health services remotely. As more companies stepping forth to bring telemedicine through mobile applications, the privacy policies of such apps need an examination to assess issues related to privacy and security.
Methods: Following app selection criteria, 13 Indian telemedicine app finally selected. The privacy policies studied and evaluated for data collection, handling, and storage practices. Results: 12/13 (92%) apps disclosed the nature of the patient data collected from the user yet, only 2/13 (15%) apps characterize the data into personal and sensitive type. All policies disclosed sharing information with third parties however, location is not disclosed by 7/13 (53%) apps. 8/13 (66 %) app policies stated right of the users to access, correct or modify, and delete their personal information.12/13 (92%) app policies contain no specific details for the storage location of the collected data.
Conclusion: The policies lack clarity and full disclosure of privacy practices related to patient's confidential data. Lack of sufficient information prevents the users of such apps way they utilize telemedicine services with full responsibility. Indian laws regulating telemedicine apps require patient-oriented amendments.

INTRODUCTION:

According to the International Telecommunication Union (ITU), by the end of 2019, 53.6% of the global population is going to be online, and 93% of the world population will live within the coverage area of a 3G or higher network. In 2018, India had 1.2 billion people with mobile subscriptions and a 560 million internet subscription. Additionally, 354 million have smartphone devices, and 12.3 billion apps downloaded on smartphones in 2018 alone.

The growing use of smartphones with access to the internet has transformed the definition of traditional health care delivery and the physician-patient relationship. Telemedicine, which offers remote delivery of health services, including diagnosis, treatment, and prevention of various

diseases by health care professionals using IT tools and smartphone devices, has reemerged as a useful application for the benefit of the health of individuals.

On Google Play and Apple app store alone, over 318,000 apps are available, out of which 48% apps focus on health condition management, including apps that provide disease-specific information, medicine reminders, and access to care.

Users, patient as well as health care provider, benefit in many ways from telemedicine mobile apps. Key benefits help users transcend geographical and temporal boundaries, reduce the cost of seeking health services, increase patient comfort and satisfaction, and digitalize health communication However, privacy and security risks associated with such apps, primarily concerning health data collection, use, and disclosure remain unaddressed, hence limiting the growth of telemedicine.

These apps generally rely on third-party service providers for various services, from enhancing user experience to monetizing with ad integration. Most often, app users are unaware of the fact that third-party service providers collect information that may be confidential and privacy-sensitive.

With the above concerns in view, privacy policies of apps assume a critical role. Without a fair understanding of privacy-related policies, users might be unknowingly submitting sensitive health data. The risk is real, with security breaches or leakages becoming ubiquitous.

The study aims to analyze the content or privacy policies of mobile telemedicine apps available in India to estimate the level of threat to privacy. To date, a limited number of studies have securitized privacy policies and data handling practices, including sharing, disclosure, and transfer of information to third parties. In India, with no specific guidelines in place to check gaps in existing policies and data sharing practices, henceforth present study tries to provide evidence for required reforms.

The research paper tries to find answers for the following three key research questions by assessing the privacy policy content:

1. How many apps disclose the type of information collected from the patient?
2. How many apps share information with the 3rd party service providers?

3. How many apps give users the right to handle their personal information?

MATERIALS AND METHODS:

App selection process:

The most popular app store on Android OS, Google Play Store, was searched for applications providing telemedicine services using keywords “Telemedicine”, “Teleconsultation”. The search was conducted in Delhi, India, between May 26, 2020, and June 3, 2020. Google Play, from any search, presents a maximum of 250 results, therefore all the apps were selected and studied for inclusion criteria. The goal is to analyze apps most commonly downloaded by patients. As most users prefer to download apps from the top 10 results, the initial search which is limited to 250 apps seems to be sufficient for this research

Inclusion and Exclusion Criteria:

A structured app selection process adopted following inclusion and exclusion criteria. Apps met inclusion criteria only if, 1) free to download; 2) in the English language; 3) provide services in India or any Indian state; 4) downloaded more than 1,00,000 times, and 5) used to establish communication between patient and doctor. Apps excluded if, 1) provide fitness or other health-based

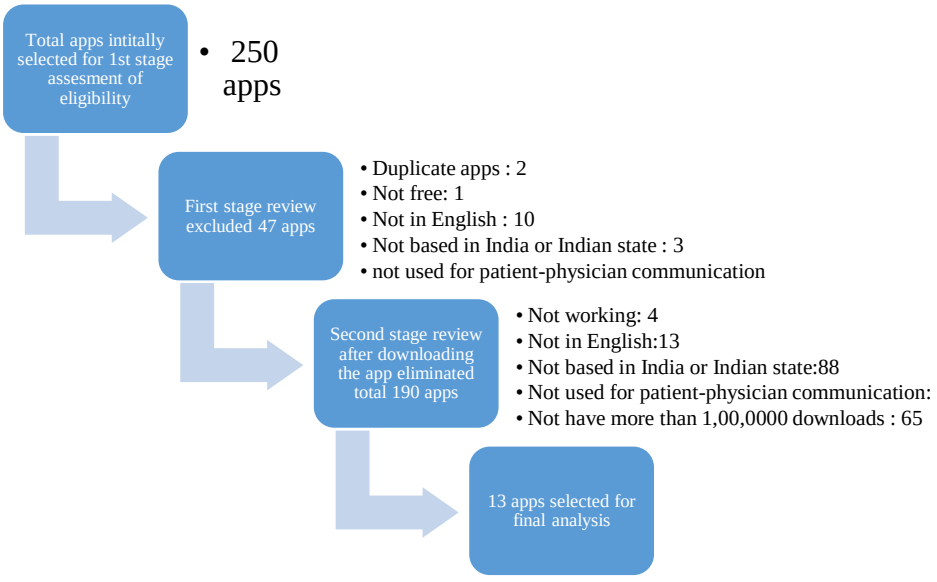

FIGURE 1: App selection process

services and do not establish a direct connection between patient and doctor; 2) Apps providing services in India but operating from outside India, and 3) non-function apps. At the initial step, apps name and short descriptions reviewed to assess whether or not apps meet inclusion criteria. Duplicate apps are also identified and eliminated at the same time. In the second step, apps downloaded and a full description of apps analyzed. The total number of downloads further checked at this stage as per the inclusion criteria. After stage 1, a total of 47 apps excluded. And in the second stage, a total of 190 apps eliminated from the scope of the study.

Assessment methodology:

Set of criteria developed by selecting the rubric from *Rosenfeld et al's* review of privacy policies for dementia apps. The criteria to evaluate telemedicine apps' privacy policies considered both general characteristics and individual-level data. It was examined whether privacy policies explicitly stated the type of data collected and distinguish personal from the sensitive kind of information. All the policies searched for "encrypt, encryption" to assess the existence of security measures. We documented whether policies acknowledged sharing information with third parties, as shown by the use of the following term; "advisers, affiliates, business partners, service providers, third parties." The location of such parties also noted. Regarding selling or renting the data, any mention of "transfer, exchange, share" is noted. Further, the right of a user to handle the data evaluated by reviewing each policy to see if the user could access, change, or delete the data. Whether each of these criteria was met or not met, or not mentioned in the privacy policy is noted.

RESULTS:

Of 13 apps selected, only a single app displayed its privacy policy in the full text before a user proceed to sign up for services. Remaining 12 requires to agree with privacy policies along with terms and conditions by checking the box provided separately.

13/13 apps stated that, by providing consent for the privacy policy, the user approves various data handling practices outlined in the policy text, which implies no separate permission requested from the user. 12/13 (92%) apps disclosed the nature of the patient data collected from the user yet, only 2/13 (15%) apps characterize the data into personal and sensitive type.

Sensitive information included password; financial information such as bank account or credit card or debit card or other payment instrument details; physical, physiological and mental health condition; sexual orientation; medical records and history; biometric information; any detail relating to the above.

Of the technical information, device information including model number, IMEI number and OS, IP address, and browser type, 7/13 apps disclosed collecting such information.

All of the policies mentioned cases in which user data would be shared with third parties. The location of third parties, however, is not disclosed in 7/13 (53%) apps. Remaining 6/13 (46 %) clearly stated that the location of such parties might or might not be outside India.

5 of 13 policies (34 %) acknowledged selling or renting user's data. 66 % (8/13) policies used the terms share, transfer, or exchange to disclose selling of data.

Nearly 84 % of app policies (11/13) mentioned that the company is not liable for any collection or disclosure of personal information when users visit external links provided on their platform. And 16% (2/13) app policies did not specify whether external links can collect or disclose data.

The right of the users to access, correct or modify, and delete their personal information specified in all 8/13 (66 %) app policies.5/13 policies (34 %) stated various exceptions to request to delete personal data.

Only a single app policy specified the approximate duration of data storage, and after such period data is de-identified and used by the company. 12/13 app policies contain no specific details for the storage location of the collected data. Table 1 provides detail of the privacy practices of 13 apps concerning the duration of storage of personal data.

To manage complaints regarding data handling or other related issues, only 4/13 apps (30%) specify the grievance redressal mechanism in full detail- Officer's name, address, email ID, and contact number.

NO. OF APPS	DURATION OF STORAGE
1	3 years or as long as necessary to provide user with services or as may be required under any law.
6	As long as necessary to provide user with services or as may be required under any law.
6	Do not mention duration of storage

Table 1. Duration of storage of user information as specified in privacy policies (n=13)

DISCUSSION:

Our findings suggest that the availability of a full-text privacy policy for reading and understanding purposes before signing up exist in a single app only. The non-existence of the requirement to compulsorily check privacy policy before using the app substantially increases the chances that the user will agree to terms without ever reviewing them. In a study conducted on 15 menstruation-tracking apps, no apps required that the privacy policies be viewed before use.

The data once shared with third parties gets a life of its own therefore user relies on trust build by companies to guide their decision. In India, the data controller is free to handle data and share it with the third parties once the consent is obtained. This principle underlies the consent-based

model. The results point that consent to share information with third parties is usually obtained simultaneously with initial approval of the privacy policy. No separate consent was taken from the users. It is critical to inform the users about the location of such entities as laws overseeing personal information changes with the change of jurisdiction. Current rules do not govern foreign companies if they deal with personal data of individuals in India. It is significant as our result infers that almost half of the apps share, transfer, or exchange data with parties that may be located outside India. Users should have more sweeping rights based on how, where, and in what form personal data could be shared.

At present, In India, the usage and transfer of personal data regulated under the Information Technology Act, 2000. Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules which was notified in 2011 requires that personal information collected from user distinguished from sensitive personal information. Processing sensitive personal data necessitates the explicit consent of the user. However, 85% of apps do not mention the type of sensitive information gathered by them. Moreover, the conservative definition of sensitive personal data provided under the rules places the majority of confidential data outside of legal scrutiny.

Grievance redressal mechanism to remedy any lapses in handling, storage, or any other grievances is either inadequate or remain absent from most of the privacy policies. It is in contravention to current rules which mandates corporate entities must assign a grievance officer to address all discrepancies or grievances reported to the data controller.

FUTURE RESEARCH QUESTIONS AND CHALLENGES:

The digitalization of the health sector is happening at a rate never seen before. Many independent developers or small start-ups are coming up with telemedicine apps with no or less experience in privacy practices. This fragmentation of the health market has complicated the complacency efforts of government and regulatory bodies. In this new age of technology, the methods of handling personal data are becoming redundant. Health data contains information that is mostly confidential and sensitive. The potential of harm in case of leakage or malicious use is inconceivable. Gaps in current legislation that regulate how personal information is collected,

processed, and handled through these apps in India have weakened the patients' right to protect themselves. As the field of mobile-based health applications grows, the policymakers and program managers need to evaluate legitimate concerns about the security of citizen data/information and develop and implement appropriate policies and strategies.

The capability and convenience of technology have created more health data. With the rising number of health-related data breaches, the tools adopted to secure sensitive health information need to evolve with time. On the other side, the policy should address data ownership and the extent to which information can be collected and used for business purposes without violating privacy.

More research in the field of data security and privacy of Indian mobile health apps is needed to generate evidence that can make aware and guide users, businesses, and governments about challenges and need to formulate and enforce strict data protection laws.

CONCLUSION:

The results of this study are in coherence with similar researches conducted around the world. The privacy policies found to have grave deficiencies and suggest an immediate need for improvements to secure public confidence in the IT systems. Modern telehealth platforms provide new ways and opportunities for delivering health care services at any location. However, there is a requirement for technological and policy safeguards to mitigate risks originating from sharing of data with third parties, incomplete disclosure, transfer of data outside the country of origin and lack of safe security practices .The digitalization of health will not be able to reach its full potential until the issue of data privacy is solved.

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