MENTAL HEALTH TECHNOLOGY – WHAT'S IN STORE?

Arun Gopalakrishnan[1], Minu Jayan[2].
[1]Senior Resident, KMCT Medical College, Mukkam.
[2]Consultant Psychiatrist, PVS Hospital, Calicut.
Correspondence: Dept. Psychiatry, KMCT Medical College, Mukkam. E-mail: drarungk85@gmail.com

ABSTRACT

Technology is an indispensible part of everyday life. It has affected all walks of modern life, medicine being no exception. Smart phones have penetrated our society to an astonishing extent. With the growing influence of this technology, it was only a matter of time before applications and gadgets were incorporated to smart phones for daily usage. The rapid growth in the use of smart phones has opened a new world of opportunities for use in health care and more recently in behavioural health care. This article deals with the smart phone applications in mental health and future prospects in this regard.

Keywords: mobile mental health, mental health technology

INTRODUCTION

We take pride in psychiatry being a branch of medicine dealing with human behaviour and thus closely related to the societal life. It acts as a bridge between the social and medical sciences and evolves with each and every advent in the society. With new technologies come changes that affect our lives, and in turn, psychiatry. So it becomes imperative that clinicians are more aware of technological advances around them.

Technology is an indispensable part of everyday life. It has influenced all walks of modern life, medicine being no exception. Technological advances have been more pronounced in fields of medicine other than psychiatry. In psychiatry, there has been a recent and rapid spurt in technology useful both in investigation and psychopharmacology.[1] Technology has affected the way we learn and teach to the extent that e-learning is now considered a second revolution in psychiatry.[2]

BACKGROUND

Internet is now much affordable and easily available. According to the 2015 statistics, Asia accounts for 48.2% of the global internet users and India accounts for 22.6% of it.[3] Majority of users in India are under 35 years of age.[4] We are looking at a new generation of patients who spend a lot of time online. This is bound to affect the way they present themselves to the psychiatrist. They would have read and researched about their symptoms, the possible diagnosis, and available treatment options. The focus of this article will be largely on mobile internet based applications and their relevance in mental healthcare.

SMART PHONES

Smart phones have changed our concept about phones. From being a device which was a luxury targeted at the elite, it has gathered popularity and found itself in all walks of the society. With the introduction of smart phones, there have been

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massive developments in digital technologies over the past decade.[5]

Statistics from 2015 reveal that 75% of Indians are mobile phone users and that we have 200 million active mobile internet users.[6] Smart phone use has increased exponentially in India in the recent years. Smartphone users in India is expected to reach 651 million by 2019.[7]

As people are becoming more aware and concerned about their health, applications and gadgets concerning health are being incorporated to smart phones for daily usage. There has been a recent surge in attention on mobile health technologies.[8] This enthusiasm is partly due to the fact that more and more clinicians have started using smartphones, and also due to the stream of mobile medical apps and devices being created.[9] The rapid growth in the use of smart phones has opened a new world of opportunities for use in behavioural health care. Smartphone apps provide useful functions that can be integrated into conventional manualized treatment.[10] Patients within the mental health system increasingly own smart phones and are interested in using these devices to monitor their health.[11]

APPLICATIONS

A wide array of applications (apps) pertaining to mental health are available in smart phones, across both Android and iOS platforms. Authors have tried to summarise a few of the available applications in Tables 1 and 2.

Applications like Pacifica and many more have been developed by a group of individuals comprising of mental health professionals as well. All apps do come with a warning that they should not be the sole line of treatment and should not be substituted for a trained therapist or a clinician.

Code Blue is an app that is being developed and will be launched soon in the UK. It is an app which targets teenage depression and can send alerts to the support group. There are other applications like the eMoods Bipolar Mood Tracker app by Gigaram Technologies too. This consists of a daily tracking system that enables users to input and keep track of

Table 1: *Applications meant for professional use*

NAME	DEVELOPER	FEATURES
PsycEssentials	American Psychological Ass.	Assessment tests, referral resources, and drug information
PAR Assessment Tool Kit	PAR, Inc	Bell curve, age calculator for standardized assessments
Drugs.com Medication Guide	Drugs.com	Drug information
APA Monitor On Psychology	APA	Magazine – Monitor on Psychology, Monthly updates, offline reading
Clinical Scales	Psychiatric Times	Scales
DSM – 5 Diagnostic Criteria	APA	Criteria and codes
Depression	Doctot	Scales, email integration
APA Journals	American Psychological Ass.	Journal
Concise Cognitive Screening Exam	Central Florida Psychological Consultants	Dementia. Simple questions with yes or no answer

Table 2: Applications for non-professionals

NAME	DEVELOPER	FUNCTIONS
Code Blue	Melon Health	Teenage Depression, bullying and alerts support groups
Pacifica	Chris Goettel	Stress, anxiety, depression based on CBT, Relaxation, mood charting
Breathe2Relax		Stress management, relaxation techniques
PTSD Coach	Department of Veterans Affairs' National Centre for PTSD	Self-assessment, personal support, suicide hotline
Talkspace Therapy	Groop Internet Platform inc.	Chat with a therapist anytime
Elevate	Jesse Pickard	Cognitive training tool, game based. App of the year 2014
My Journey	Youth Mental Health Network	Monitor drug schedules and functioning in Schizophrenia
Big White Wall		Discussion boards, reference articles, self-assessment tests.

subjective mood ratings in an electronic mood journal and can also generate reports that can be sent to a family member, caregiver, or clinician.[12]

Even though there are numerous applications related to mental health available online, only few have been formally evaluated.[13] There have been only a few studies concerning these applications, hence there is still a paucity of data regarding negative outcomes with such technologies.[14] Mobile mental health is an ever dynamic field and because of this reason, it is often difficult to define the boundaries of such technologies as apps. But it is important to remember that every intervention carries a fair amount of risk and future research in this direction will be much welcome.

FUTURE TRENDS

Psychiatrist and therapists are now available for online consultation. This is now advocated as a special facility. However, this may become standard in the near future. Many appointments will be fixed online, saving time and increasing access. The consultations will be done using an app in a smart phone or a tablet, and consultant and the patient will be available at the time slotted. This will ensure consultations at the comfort of your home or anywhere comfortable for the patient as well as the therapist and would therefore help neutralise the stigma.

There will be development of on-body embedded implanted sensors which will connect patients wirelessly to the internet, help clinicians get regular monitoring and initiate preventive interventions.[15] These sensors can be in the form of wearable computing like glasses or wrist bands or prosthetics. We might witness development of facilities which will directly mail this information to the consultant aiding in accurate monitoring and recording. The data so received can be saved and when the patient comes for the next visit, it might be automatically displayed on the consultant's phone or computer. This, to an extent, will help us to monitor drug compliance as well. Regular tracking of one's own health status can help in earlier intervention.

There is going to be an upsurge in big data analytics.[16] This includes large scale data collection, storage, and analytics. Information thus gathered can be shared and used for patient empowerment.[17] Access to one's own records and up-to-date information on care will increase in importance.

There is bound to be an interest to develop in 'Metadata'. Metadata, in essence, is data of data which will give an idea about the reason for creation of data, purpose of the data created, time and date stamps, and so on. This implies that the amount and type of internet usage by a person can be tracked and analysed. Unfortunately, metadata has not been used much by health care. But given metadata's potential to support health care, it is just a matter of time when we will see further movement in this direction.

GPS or global positioning system can also be used in tracking patients, as done now in mood disorders,[18] and will find its importance in other disorders, especially dementia. AV recording, data storage and speech and video processing is another field to look forward in the future. The convenience, portability, and excellent quality of digital audio and video recording on today's smart phones make them an ideal choice for recording sessions. Such recordings can be later viewed by the patients for review of any specific advices. Consultants can too view this in an attempt to improve further sessions or to view goals set in the therapy session.

Many Smart phones have the capability to connect to external hardware devices, such as biofeedback sensors, for monitoring physiological signals. The PLX xWave, for example, is a portable sensor that attaches to an iPhone, iPad, or iPod Touch that can track the various brain waves to provide neurofeedback.[12]

Games are amongst the most downloaded applications over any platform. Video game technologies to promote health-related behaviours are being focused upon now.[19] Many applications, like Elevate, use a game like theme and interface and provide cognitive retraining. Games can also be used for therapeutic effects.

Mobile phones will also be increasingly used for sensing and inferring individuals' emotions as well as their activities, proximity, and verbal and nonverbal interactions among members of social groups, whereby it will be possible to asses if your patient has been spending more money recently, or has been gambling or was particularly active or withdrawn from social media.[20]

The issues of privacy, correlation, and consent over uses of large data are future key challenges in this area.[21,22] More advanced databases like the Hippocratic databases provide less intrusive surveys which helps in maintaining privacy.[17] There have been efforts to maintain confidentiality and access to data by several organisations.[23]

Technological advances indeed pave exciting times ahead for psychiatrists. We may be witnessing a second revolution in psychiatry which will change the face of mental health care as we know it. However, it would do us well to remember the words of Christian Lous Lange "Technology is a useful servant but a dangerous master".

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