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Snips from the Journals

Psychiatry, caught in the web of the internet

L Amarakoon, R Fernando

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In recent years, Sri Lankans were hit hard by successive tragedies that destabilised its socioeconomic balance. When people were thriving after the Easter bombing and the COVID-19 pandemic, the economic crisis added many more negative consequences. One such effect is the migration of medical professionals, leading to reduced human resources at various levels in delivering mental health care in the Sri Lankan context. Emerging clinical evidence also seems to be at a disadvantage level where increases in mental health issues are highlighted. Alwis et al., 2023 found that approximately 1 in 5 individuals in the Sri Lankan population meet the criteria for a depressive disorder, and the highest rate (39%) is seen in young (1).

In this background, Sri Lankan psychiatry has faced a significant challenge of exploring the options for effective service delivery to match the rising needs of mental health services amid inadequate resources. Turning towards the 'internet' may be a way to manage this need as the digital world is florid following the COVID-19 pandemic. Methods to reach people without physical presence have become accepted, familiar, and comfortable for many individuals. In relation to this, there have been recent developments in the field of psychiatry, including telemedicine, social media platforms, artificial intelligence, and Chatbot. If the effectiveness of these new technologies can be systematically explored, they can be effectively used for mental health promotion, identification and management of psychiatric conditions in the Sri Lankan population.

Telemedicine

Telemedicine is the use of electronic technologies to deliver health care when distance separates the participants (2). Although video conference of a medical review is the most used telemedicine practice, it is only a part of a spectrum of health care systems that range from a simple phone consultation to sophisticated telesurgery, where a surgeon receives tactile and visual information to guide a robot to perform the surgery at a distant site. The use of telemedicine can be broadly divided into 'real-time' diagnostic and therapeutic purposes (e.g. video consultation) and 'store and forward' technologies (e.g. getting an expert opinion on a CT using telemedicine). Another way of division of telemedicine is the 'clinical' and 'non-clinical' use. Clinical use includes all the patient care applications (e.g. diagnosis, treatment and other medical decisions), and non-clinical use has other uses that do not involve a decision about care for a particular patient (e.g. medical education, management meetings, etc.). However, infrastructure development, ensuring the safety and confidentiality of electrobic patient information, poor digital health literacy, and high cost of internet services can be identified as challenges in telemedicine (2). The other major challenge of delivering mental health services through telemedicine is, whether it can offer the same services that are available in person (3).

In the current Sri Lankan situation, where many medical experts are migrating, mental health services are being centralised. In this context, telemedicine can be used to manage patients with mental illnesses in rural areas. This may reduce speciality care costs and support primary care clinicians in delivering mental health services. Although there is good evidence about the effectiveness of telemedicine in mental health care in the West (4), it is essential to generate Sri Lanka specific data to see the effectiveness of telemedicine in our socio-cultural context.

Digital phenotyping

Digital phenotyping, also known as digital epidemiology, describes the process where an individual's behaviour is inferred using digital data generated through human interactions with individual devices (how that particular person used the internet, referring to search content, frequency, etc.). A wide range of digital data sources, such as mobile digital devices (e.g. smartphones, wearables, medical or experimental devices) and individual electronic activity (e.g. social media use, device activity, e-store use), are used to collect digital data. There are two main forms of digital phenotyping, namely active and passive. In active digital phenotyping, the individual is requested to perform an act or a task to capture the data (e.g. completing a survey). In contrast, in passive digital phenotyping, the individual's behaviour is analyzed through regular daily digital activity (5).

Experts explain the effective use of digital phenotyping in the early identification of mental health conditions such as depression, stress and addiction, in addition to general well-being and obesity (6). Also, it helps avoid recall bias and access new data like mobility patterns and environmental factors in relation to psychiatry. This may also be useful in populations where diagnostic boundaries are more unclear, such as early psychosis and presentation in adolescents (7). Positive evidence is emerging supporting the use of smartphone-based monitoring for early identification of bipolar disorder and unipolar depression. However, these trials found no effect on primary or secondary outcome measures, including the severity of symptoms or re-hospitalization rates (8).

Digital phenotyping is only effective if it correlates with clinical symptoms and functional outcomes. Some of the main problems of digital phenotyping are ensuring the privacy and confidentiality of personal data and information governance. Additionally, clinicians' and patients' lack of knowledge of technology and the requirement of infrastructure developments, research-level issues (different definitions used in various research, lack of placebo literacy in digital health, scarcity of studies in assessing clinical validity) are challenges in adopting digital phenotyping in clinical practice (7).

Social media and Apps

Social media is the digital technology where people share information and ideas through networks and communities. Out of many social media platforms, the common ones include Facebook, WhatsApp, YouTube, Instagram and TikTok. According to DataReportal, there were 14.58 million internet users and 7.2 million social media users (32.95% of the total population) in Sri Lanka in early 2023 (9). Social media has its own benefits as a part of digital phenotyping and improving mental health literacy. However, stigma in social media is common, along with some ethical issues (10).

Mobile Apps or Applications are software programs used in smartphones or Tablets. There are 10,000 to 20,000 mental health and wellness apps available for smartphones, facilitating clinical care, personalised resources, peer support, emergency care and psychological therapies. However, only a few of these apps are backed with evidence for their effectiveness. Marshall et al., 2020, in their systematic review of 293 commercially available apps for depression and/or anxiety, found that only 55.3% of the apps indicate an evidence-based framework. Moreover, of the 162 apps that mentioned a theoretical framework for their app, only 6.2% had published evidence supporting their efficacy (11).

There is some promising evidence in some of these apps in mental health care. For example, the PRIME app promotes the functional recovery and mitigation of negative symptoms in people with schizophrenia through a supportive, personalised network and the Moderated Online Social Therapy (MOST) digital platform offers personalised therapy combined with social connections (12,13). Smartphone apps can be a low-cost, easily accessible mechanism to deliver effective self-management interventions for symptoms of depression and anxiety in the non-clinical population (14). However, evidence-based treatment for clinical depression and anxiety has not been established with these apps. Mobile applications can be used effectively in mental health services by involving professionals in the development of apps, testing apps in local care settings, frequently assessing efficacy with well-designed randomised control trials, and using validated treatment modalities within the app (8).

Chatbot

A chatbot is a computer program designed to simulate a conversation with another human being. There are various types of Chatbots, some of which are ChatGPT, Amazon's Alexa and Apple's Siri. Chatbots in mental health or 'robot therapists' are intelligent automated systems developed to listen and respond to people's mental health needs. Most of these are text-based, but animated videos and physical robot versions have also been researched (8).

It is interesting to know whether this 'digital therapeutic alliance' is acceptable and effective for humans. Early research has shown promising evidence that some people are more comfortable conversing anonymously with a Chatbot at a high satisfactory rate (15). Many of the studies about chatbots were done in relation to depression. Few were done in anxiety, post-traumatic stress disorder (PTSD), schizophrenia and autism spectrum disorder. Though some studies show mental health benefits, findings are inconsistent across studies. Some drawbacks of these studies include small sample sizes, short duration and lack of follow-up studies (8). Studies have also found that there is a deficiency in appropriate contextual responses to complex language and a failure to identify and deliver appropriate responses to serious mental health issues, such as suicidal ideation and domestic violence (16). According to the currently available evidence, Chatbot is best used only as a supportive means in the broader treatment plan.

Artificial intelligence (AI)

John McCarthy, the computer scientist who originally coined the term artificial intelligence (AI), defined it as the science and engineering of making intelligent machines (17). AI is increasingly used in the fields of radiology, oncology, ophthalmology and dermatology

to facilitate the faster detection of abnormalities and diseases, widen the understanding of disease progression, enhance treatments and discover innovative treatments (18). In some fields of medicine where pattern recognition is important, AI algorithms have exhibited comparable or superior performance to experienced human beings.

The use of AI is much restricted in the field of psychiatry as the practice of psychiatry relies more on soft skills, such as establishing rapport, developing therapeutic relationships and observing the behaviours and emotions of patients. Furthermore, the subjective and qualitative nature of clinical data in mental health limits the use of AI. However, recent research focuses on the use of AI in diagnosing mental illnesses, identifying individuals at risk of developing mental illnesses and using AI tools in treatment programs (19). Saeedi et al., 2021 demonstrated using an EEG-based deep learning framework of artificial intelligence to accurately discriminate major depressive disorder patients from healthy controls (20). Similarly, machine learning algorithms have shown success in differentiating psychotic disorder patients from healthy controls with more than 70% accuracy (21). In addition to the predictive and diagnostic purposes, AI-powered tools are being tested successfully for treating mental illnesses. For example, the use of virtual reality-assisted therapy through an AI avatar encourages schizophrenia patients to engage with auditory hallucinations. Robot-mediated interventions are being used to help patients with dementia and autism spectrum disorder (17).

Studies related to AI and mental health are limited in Sri Lanka. Although the initial cost of establishing artificial intelligence-based systems is expensive, the eventual benefits, such as patient's ease of divulging symptoms without the fear of being judged, the ability to deliver services to remote areas, limiting unwarranted variation of clinical practice and preventing avoidable medical errors, outweigh the initial cost (22). In the context of increasing numbers of mental health issues and reducing human resources, research is needed regarding the use of AI in mental health in Sri Lanka.

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