

Chapter 17

Real-Time Mental Health Monitoring: The Indian Scenario

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ABSTRACT

Mental disorders have been identified as one among the leading causes of the global disease burden. Despite being one of the first nations in the world to identify mental health as an important indicator of personal well-being and having adequate plans and policies for ensuring the same, one in every seven Indians is affected by mental disorders of varying severity. Through this manuscript we try to analyze how real-time mental health monitoring has helped improve productivity among the global workforce as well as prevented deterioration of individual mental health across the globe. Our main plan of this study is to identify the significant efforts in mental health monitoring across the globe and then chalk out a real-time mental health monitoring framework for India. We also propose a real-time mental health monitoring smartphone-based framework for India we name as SmartMHealth. We describe the basic components of this framework in this study itself.

INTRODUCTION

As per the World Health Organization estimations varied mental health issues cost the world economy approximately an annual \$1 trillion loss in global productivity ("India is the most depressed country

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in the world,” 2018; James, 2019). About 450 million people globally experience some form of mental health disorders (“Augmented Mental Health,” n.d.). \$467 billion is the burden of mental disorders on the US economy annually. Given these startling estimates it is important to realize that a mentally healthy population is a key contributor in the success of any nation. Mental health is a key marker of the emotional, psychological and social well-being of an individual. As per World Health Organization (WHO) estimates, at least 6.5 per cent of the Indian inhabitants experiences some type of severe mental disorder, with no distinctive rural-urban discrepancy (World Health Organization, 2007). Positive mental health is a significant indicator of an individual’s well-being at each stage of life (Vihan Sanyal, 2018). In fact, it is a fact that good mental health is one the underlying facets to prolonged and fruitful human life. Varied factors like stress, depression, social anxiety, drug addiction, obsessive compulsive disorder and other personality disorders may add to mental health issues leading to mental illness (“Mental health in India,” 2017).

Hence, in the current times when competitive, technologically-driven social life is governing most people it has become imperative to verify the inception of mental illness to retain normal life balance. In an era when augmented mental health is emerging as the new paradigm in mental healthcare through data and digital therapeutics. Achieve early detection and prediction of human mental health is no longer a distant dream. Several machine learning algorithms and artificial intelligence have and can be applied for this realisation (Gurjit & Neena, 2006; Hillestad et al., 2005; Kumar & Hancke, 2015; Paul et al., 2018; Price et al., 2014). Such application when applied in real time shall profit the society at large by serving as a monitoring and control tool to identify onset of deviant or malicious behaviour among otherwise healthy and productive individuals.

The rest of the manuscript is structured as follows: Section I discusses the current scenario of world mental health. Section II highlights the need of effective mental health monitoring solutions. Section III stresses and analyzes the varied available mental health monitoring mechanisms. Section IV details the Indian state of affairs in mental health monitoring. Section V proposes SmartMHealth framework for real-time mental health monitoring. Section VI concludes the discussion.

Need of Mental Health Monitoring

As per global statistics (Kamdar & Wu, 2017), Neuropsychiatric or mental disorders along with cardiovascular diseases, cancer and other communicable diseases are a major contributor to the global burden of diseases and disease-related mortality. Table 1 below lists certain major neuropsychiatric disorders that are currently daunting the human race.

Though these disorder types contribute more than 10% to the prevalent disorders and diseases, however, research in monitoring or control of these disorders is still lagging behind (Kamdar & Wu, 2017). As per WHO estimates many developing and developed nations across the world are bearing the burden of mental disorders. Outcome based monitoring and feedback systems on therapeutic mechanisms have become popular in recent times and have been implemented by several health care providers all over the world. However, these don’t seem to be implemented widely in mental health care (“India is the most depressed country in the world,” 2018) (Birla, 2019). Mental healthcare as opposed to other non-communicable diseases requires continuous monitoring on a regular basis. Patients with psychiatric disorders may suffer behavioral symptom on a relapsing basis. Hence, to provide optimal care to such patients it is important to have some low-cost, widely available, real-time monitoring mechanisms in

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