

Startup in the Physiotherapy Profession and its Impact on Growth and Development of Indian Economy

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These days many people are suffering from lots of lifestyle diseases which occur due to poor hygiene, physical inability and eating unhealthy food including tobacco and alcohol. These problems emphasized the importance of physical activity and self care to improve health. There are lots of advancement in physical therapy like gamification, artificial intelligence, visual based rehabilitation, augmented reality and robotic assistance which are playing advance role in putting physical therapy to a new world of technology. Apart from technology, these advancements are influencing many aspect of society like social, economic, health, legal and education and which may have a significant impact on public sector specially

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health. It may improve the economic sector of India. Physiotherapist in upcoming near future will be working with information network and thereby using these technologies to analyze and interpret the data. This paper will describe some technologies based on physical therapy practice and how it will impact the growth and development of Indian economy.

[**Keywords** : Startup, Physiotherapy profession, Lifestyle diseases, Indian economy]

1. Introduction

As per the World Health Organization (WHO), India has a population of 1.295 billion and still growing, public health expenditure sums to 30% of total expenditure which includes expenditure on curative as well as preventive services, among others.¹ Rehabilitation needs are growing in tandem with global population growth.⁴ These days many people are suffering from lots of lifestyle diseases which occur due to poor hygiene, physical inability and eating unhealthy food including tobacco and alcohol. These problems emphasized the importance of physical activity and self care to improve health.

Using the Global Burden Disease study (GBD), it has been found that there is increase of 17.6 % from 2005 to 2015 in Year Life Disabilities (YLD) for health concern associated with severe disability [5]. It has also been found that there is 75% of rehabilitation is required in these YLD cases.⁵ It has been found in a study that there is 66.2% growth was found in estimated in YLD counts amenable to physiotherapy which has shown a significant linear growth of around 5.1 billion YLD's per year.⁶

Health economy is evolving and it required proper allocation of resources for better health and development. It is an important factor for health care providers to evaluate economics on basis of identify, measure, value and compared the cost and consequences of alternative treatment[8]. When economic cost is discussed, it is refers to direct cost, indirect cost and intangible cost.⁷

- **Direct costs** : relate to those costs involved in the provision of the health service such as salaries, blood test and X-rays costs, treatment costs such as radiotherapy, medication costs, travel expenses and capital costs;
- **Indirect costs** : are those costs associated with lost productivity due to inability to work or days lost while receiving treatment.

- **Intangible costs** : refer to the costs associated with the symptoms of disease such as pain and depression.⁹

2. Field of Physiotherapy

Field of physiotherapy is evolving with Evidence Based Practice (EBP) for patient care and improvement in health care system. Incorporation of EBP has lead to procurement of increased funding in physiotherapy. It has been done by identifying the effective service and better treatment plans.⁷

According to recently published Pharmaion report, "India Physiotherapy Equipment Market Opportunities, 2010 - 2020", the physiotherapy equipment market in India is projected to grow at a CAGR of over 12% during 2015 - 2020. There are several startup physiotherapy technology which are emerging the world and playing advance role in putting physical therapy to a new world of technology such as gamificaton, artificial intelligence, visual based rehabilitation, augmented reality and robotic assistance. Physiotherapy is an elastic market in health care system which makes it vulnerable to economic changes.⁴

Modalities which are being recently used in physiotherapy include supervised and unsupervised exercises but recent advancement in technologies is opening new horizons. These may include Virtual Reality (VR), Augmented Reality (AR), Gamificaton and Telerehabilitation.¹⁰ Apart from these advance technologies there are other technologies which help a person before and after surgery. These technologies bring quality of life in person's life. Through advancement in rehabilitation technology post injuries rehab protocol bring the hopes in expedited recovery which reduces the recovery time and disability and standardization of treatment. These technologies include blood flow restriction technique, force plate, motion capture, instrumented insoles and joint arthroplasty.¹⁶

VR and AR deceived the human brain by making them believe they are in different place which is different from the real place. In VR, patients interact with environment and stimulate activities which are relatable to real life. In AR, virtual reality and real reality overlap.¹¹ In VR there is more risk if injuries as patient is unaware of the real world whereas in AR risk of injury is less and patient is aware of potent danger.¹²

Telerehabilitation is a branch of telemedicine that allows patients to communicate with their health care provider remotely during rehabilitation session.¹³

Gamification is 3D rehabilitation program which is a game based design element in a non game context that has been used in patient with several diseases like knee and hip arthroplasty, stroke, idiopathic scoliosis.² Old commercial games were updated into patient based games for treatment purposes. These games based program use the movement of patients.³

Blood flow restriction technique has gain popularity in limiting disuse atrophy and gain muscle strength and quality. Recent guidelines suggest personalize cuff according to patient with low load exercise to regain strength.¹⁶ BFR has been recommended in every population that is for both adult and elderly.¹⁷ Although exact mechanism is unknown but it has been suggested that large and fast twitched fibers recruits during the hypoxic state thus it create a muscle metabolic milieu that increase muscle protein synthesis.¹⁸ Researches on BFR suggested muscle adaptation and improve tendon stiffness. BFR is considering similar to high intensity training.

Force plates are used to measure force production during kinetic movement of lower extremities. Force-Time curve has been used to identify deficit in kinetic movement. During rehabilitation treatment, deficit in kinetic functional movement has been identified via comparing bilateral tasks.¹⁶ Video or motion capture synchronization can also help to detect the joint position. These finding help to target or plan the rehabilitation plan. Although force plates are majorly used in clinical and research settings, we expect it as a growing technique in individual profile setting for improvement in both musculoskeletal and sports training.¹⁶

Motion video capture is now freely available among everyone and even there are smart phone applications which help to detect biomechanics of joints.¹⁶ Both these technologies improve patient awareness of their movements. Researches have also shown greater effects in motor learning.¹⁶

Recent advancement in biomechanical laboratories has found insoles for both clinical and free living setup. They are available at low cost; provide data in real time in smart phone. This advancement helps patients with arthroplasty to improve compensatory movements.¹⁹ Insoles help in improving movement quality, increase lower

limb loading, and benefit gait mechanisms, facilitate limb loading in early phase of treatment, limit maladaptive gait pattern.²⁰ This technology in a great deal orthopedics and musculoskeletal rehabilitation.

All these technologies reduce patient efforts, hospitalization time and cost. It also increase the numbers of patients who can be treated at the same time.¹⁴ It has an another positive aspect that is direct and continuous interaction between physiotherapist and the patient which put a positive impact on compliance of treatment.¹⁵

3. Conclusion

Therefore new technologies promise for growth but have some barriers and issues which need to overcome in the field of physiotherapy. All these technologies improve remote monitoring which has implication in improving both physical activity and rehab protocol and apart from emerging technologies, these advancements are influencing many aspect of society like social, economic, health, legal and education and which may have a significant impact on public sector specially health. It may improve the economic sector of India. Physiotherapist in upcoming near future will be working with information network and thereby using these technologies to analyze and interpret the data. This paper will describe some technologies based on physical therapy practice and how it will impact the growth and development of Indian economy.

Further more studies should establish the areas of physiotherapy and technology and its impact on emerging economic value. There is raise in development and growth of economic value in field of physiotherapy but it required more evidence based researches to prove the fact.

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