

# Mobile Application Based Rehabilitation for hand Functions in Parkinsonism: A Review

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## Abstract

**Introduction:** Parkinson's disease is the most common neuro-degenerative disease. Diagnosis, assessment as well as treatment of these patients, on the other hand, is a complex process that necessitates constant monitoring. Mobile phones are helpful in control of this disease in this context.

**Objective:** Goal is to conduct a standard study on use of mobile applications in this disease.

**Materials and methods:** Study of the literature for articles announced in English between 2010 to 2015 that analysed, validated apps especially planned for and convenient in Parkinson's disease. We also searched the leading app stores for apps that could be useful for Parkinson's disease patients.

**Conclusions:** The app and literature searches gives a total of 125 apps, 55 are classified as potentially convenient in this disease, 70 were practically planned for this disease. A number of apps are potentially convenient in or partially planned for Parkinson's disease management. Though, medical confirmation supporting these utility is limited and bad nature. More research is required to confirm the device and control their use.

**Keywords:** Applications; Mobile phone applications; e Health; Parkinson's disease; m Health; Rehabilitation.

## INTRODUCTION

Parkinson's disease (PD) is a long-term neurodegenerative disorder that manifests itself into four motor structures: Postural instability, Tremor at rest, musculoskeletal rigidity and bradykinesia. Subjects, on the other hand, exhibit non-motor symptoms such as psychiatric changes, neuro vegetative symptoms, and cognitive alterations<sup>1</sup>. It is now the second most common form of neuro-degeneration. <sup>2</sup> WHO evaluated the global occurrence of Parkinson's disease in 2005 to be 4-20 cases per 10000 person/years, acceptance of 150-200 cases per 100 000 population.<sup>1</sup> According to European Parkinson's Disease Association's most recent report, there will be 8.5 million to 9.5 million cases worldwide in 2040. <sup>3</sup> Given this disease is persistent with continuously enhancing life hope in grown countries. The treatment of disease costs from 530000 to 1300 000 each patient each year related to the provenance used and the component examined.<sup>4,5,6</sup> Even if the cause of Parkinson's disease is unspecified, recent studies suggest that it is multi factorial, requiring a fusion of genetic susceptibility and variety of sustainable causes.<sup>7</sup> Because no biomarkers can verify existence of the disease, recognition of this disease is primarily based on clinical basis. It is an impediment in the different confirmation of Parkinson's disease, resulting in slow down of treatment.<sup>8</sup> In various patients, medication consists of mixture of dopaminergic drugs and levodopa which remember dopamine use, which is root cause of this disease.<sup>9</sup> Compatible rehabilitation therapy, such as physiotherapy, speech therapy, occupational therapy and psychological treatment is also required for these patients. Multidisciplinary disease management is critical: inclusion to medical treatment of signs, other medicinal methods focus to reduce disorder, raising patients practical level and quality of life to the greatest extent possible <sup>11</sup>. Neuro rehabilitation has been effective and plays major part in the management of this disease. <sup>12</sup> Evaluating the effects of the treatment necessitates ongoing, proper consideration with purpose tools, allowing us to give the proper care and treatment.<sup>13-30</sup>

The utilization of information technology in medical care has increased in recent years. In field of neurological conditions, new evaluation and management automation depends on telerehabilitation, motion analysis, virtual reality and robotic systems are being researched. However, regardless of their effectiveness, these solutions are frequently prohibitively expensive, limiting their use in clinical practise. The widespread use of mobiles begs the examination of utility as a medical tool. In Parkinson's disease, probable applications include increasing team collaboration, decreasing time-distance control in conviyence among patients and medical care executives and following patient progress.<sup>7</sup>

## OBJECTIVE:

We conducted the evaluation of released research on mobile applications that was straightly related to Parkinson's disease and could be effective in its care. Goal of the study is to characterise, examine and distribute the apps to gain a better grasp of the applications, they were identified

## MATERIALS AND METHODS:

The study looked at data in biological dictionary, mobile apps and latest technology-specific sources

## LITERATURE SEARCH:

We collected technically published articles on the plan, evolution and assessment of PD-related mobile applications. The Jadad scale is used to evaluate the high-tech nature of the added studies. This scale is known as Oxford Quality Scoring System<sup>14</sup> are confirmed, easy to use and quick to apply. To classify studies by methodological classification, a number of questions are used: even if the study is systematic and the randomization method is described; if the study is double blind and the blinding method is described; and if withdrawals and dropouts are described. The methodological quality result of 4 or more indicates sustainable methodological excellence. SEARCH OF OTHER SOURCE: Inclusion to study, we focus on mobile applications associated with this disease on major app business (Google Play, Windows Store and Apple App Store). Because no specific method for finding and categorising mobile applications has been reported.

Firstly we included all apps related to neurorehabilitation described in these study, in any case of speech or development of country. We later found the terms "Parkinson's disease" and "Parkinson" in above-mentioned business for apps that were directly related to disease or likely applicable in disease management, selecting apps that were available. The use, quality, design, usability and content of the approach all considered during this process. Finally apps are categorised according to following classification:

1. Apps used for Parkinson's disease: apps that are not specifically created for Parkinson's disease or may be used in management of the disease.
2. Applications designed especially for patients with Parkinson's disease: three subcategories:
  - Apps which provide disease information to healthcare professionals, patients, families, or caregivers are examples of information apps.
  - Apps that include many tests for evaluating patients with Parkinson's disease, such as gait, balance, speech, tremor and upper limb integration, one of the other parameters.
  - Apps which gives patient and medical care executive a set of instructions for drug management of Parkinson's disease and neurorehabilitation, such as physiotherapy, speech therapy and cognitive therapy. The group is concern to request discovered during the literature study. It is recognized that some applications may be allocate to one or more category. Few requests need the utilization of outer appliances such as additional sensors or joint movements.

## DISCUSSION:

"EHealth" refers to utilization of information technology in the subject of health, also in disease surveillance and management, public health view and analysing stimulation.<sup>17</sup> The most difficult challenge of this disease may be addressed by new technology: Patient evaluation and long-term treatment viability. Another benefit of this device is - it improve connections between healthcare professionals and patients and between both groups. Because disease primarily work on motor function, the number of patients have difficulties that prevent them from managing discussion and experiancing continuous follow-up. The WHO defines mHealth, a subdivision of eHealth, as "common health or medical practice with the utilization of mobile devices and organisation placed into the devices."<sup>19</sup> Mobile device sallings has increased in recent years, over 7.5 billion mobile phones sold in 2015, more than one for every person on the planet. <sup>9</sup> Around 97, 000 are committed to health and medicine.<sup>16</sup> In this study, we choose requests mentioned in study listed in medical databases or recorded on the app business related to PD. Apps may contain those assigned with physical exercise, comprehensive tasks, medication or diet. As per the latest information, the broadly using applications are providing health information observed by apps aiming on physical exercise, medication management (66%) and diet (66%). Look of major app marketplaces gives 105 apps that is a medication used to treat Parkinson's disease among which 50 are only for Apple devices, 40 for Android devices and 5 for Windows Phone devices; 10 are available both for Apple and for Android devices; and one is available for all 3 operating systems. Seventy-four apps are free of cost and 29 are paid, 45 target patients with PD, 34 target healthcare professionals, and 24 target both groups.<sup>30-44</sup>

## CONCLUSION:

A number of applications is practically useful or especially planed to manage this disease. Low methodological grade studies recognized stops us to more utilization of these apps. We found 120 applications mentioned in published studies in medical table and app business; 50 are used in Parkinson's disease and 70 were specially planned for the disease. Potential benefits and risks of mHealth requires regulation and additional study of field; it may provide both medical workers and patients with safe, dependable device for the care and management in Parkinson's disease.

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