Journal of
Modern Rehabilitation
October 2023, Volume 17, Number 4

Letter to Editor

Introducing Educational Application of Neurodevelopmental Treatment for Children with Cerebral Palsy

Sina Mostowfi[1], Hamid Dalvand[1*], Mohammad-Reza Hadian Rasanani[2], Abbas Sheikhtaheri[3], Kheirolah Rahsepar Fard[4]

1. Department of Occupational Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.
2. Department of Physiotherapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.
3. Department of Health Information Management, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran.
4. Department of Computer Engineering and Information Technology, School of. Information Technology, University of Qom, Qom, Iran.

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Citation Mostowfi S, Dalvand H, Hadian Rasanani MR, Sheikhtaheri A, Rahsepar Fard K. Introducing Educational Application of Neurodevelopmental Treatment for Children with Cerebral Palsy. Journal of Modern Rehabilitation. 2023; 17(4):349-351. http://dx.doi.org/10.18502/jmr.v17i4.13882

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Dear Editor in Chief

The educational approaches have significantly changed and facilitated the teaching and learning process through the advent of novel technologies [1]. In the last years, learning through smartphones along with web-based learning has become 2 main types of e-learning platforms, especially during the COVID-19 pandemic; however, smartphones are a more acceptable approach compared to web-based learning because of their availability and easy use. Accordingly, developing smartphone-based learning packages may promote the participation of students in learning procedures. Currently, there are 16 billion mobile phones worldwide, of which about 42% are smartphones [2].

Mobile health support, known as using cell phones and communication technology in health, is one of the most important technologies in public healthcare, namely the latest developments in wireless technologies, such as Bluetooth and Wi-Fi [3, 4]. According to the last statistical analysis, the number of mobile health users has increased significantly compared to the past few years [5].

Today, smartphones are used as a learning tool by students [6]. The advantages of this tool from students' point of view are easy access to information, the possibility of storing information, portability, using social media, cost-effectiveness, and secure storing of information. Students use smartphones to access textbooks, do their homework, send and receive emails, take notes, and share content [7].

Nowadays, numerous researchers and developers try to design and build mobile applications for students' and therapists' essential learning content. For example, Cheng et al. designed and developed a mobile application concerning transcutaneous electrical nerve stimulation for physical therapists. In this study, 8 therapists participated and expressed their opinions on using the application. More than 70% of these therapists stated that using this application is cost-effective and easy. The result of this study showed that therapists' knowledge of transcutaneous electrical nerve stimulation modality has increased during and after using this program [8]. Ghazisaeedi et al. evaluated the effect of an android-based application on the knowledge of the caregivers of children with cerebral palsy (CP). The results of this study

*** Corresponding Author:**
Hamid Dalvand, Associate Professor.
Address: *Department of Occupational Therapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.*
Tel: *+98 (21) 77533939*
E-mail: *hamiddalvand@gmail.com*

showed that after using the developed android application, the knowledge of caregivers of children with this disorder increased significantly in all domains of child care, except for playing [9].

A meta-analysis on the effect of interventions using mobile phones on improving health outcomes was conducted by Yang et al. In this study, 64 previous studies were examined. The results showed that education through mobile phones compared to other supplementary methods of education has significantly impacted the health study field [10].

Accordingly, by integrating these technologies, learning, and mobile health support elements, it is possible to improve the efficiency of technology and the quality of education in health-related services [11].

CP is one of the most common disabilities in children [12] and includes groups of motor and postural disabilities that have happened as a result of non-progressive brain damage that occurs during prenatal, natal, and postnatal [13]. CP causes a wide range of neurological, movement, postural-related, and intellectual defects in children [14, 15]. These deficiencies affect all life aspects of children with CP, especially their daily living activities [16].

There are several interventions to treat or reduce difficulties of children with CP that improve the functional independence of children with CP in activities of daily living along with their functional mobility [17]. One of these approaches is Neurodevelopmental Treatment (NDT), which was founded in 1948 by Bertha Bobath and Karel Bobath [18]. NDT emphasizes motor performance and repetition of activities. This method also considers errors during practice which are important for motor learning and allows the learner to compare internal and external inputs from unsuccessful to successful movements [19].

Considering that often the images published in textbooks for teaching NDT approach techniques most likely do not provide complete and comprehensive coverage on learning the contents of this field, the researchers of this study intend to teach NDT and its techniques through software. Accordingly, the developers of this study designed and developed an educational application based on smartphones to teach NDT to children with CP as an educational supplement for occupational therapists, physiotherapy therapists, physiotherapists, and occupational therapy [20]. The results showed that all users were satisfied with the application environment and domains. Also, the knowledge of students increased significantly after using the application and its contents [20].

Personal Home Page (PHP) programming language and MySQL database have been used to design software in the back-end section. Also, in the software framework section, programming has been done using the Zend language. The BASIC4ANDROID software is used to implement android applications. To identify possible software problems, the APK tool has been frequently used.

The NDT software could run on android devices that have the android operating system version 4.4.4 to 12. This application includes sections on teaching NDT, principles of motor development in children with CP, feeding, toileting, bathing, sleeping, lifting, and carrying. This software could be installed online, on mobile phones, and tablets with the android operating system, and the videos can be viewed online by connecting to the relevant server.

Study suggestions

It is suggested that further studies design and develop an appropriate application and content for caregivers of children with CP based on a neurodevelopmental treatment approach.

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