

Telehealth : Management of Functional Disabilities of Computer Users

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Abstract: "Internet has changed the way we think and we live"

Introduction: Internet is one of the key element and tool for Human Resources and Development(HRD)in 21st century. Internet based services in mobiles and computers has extended the horizon of learning and training for every individual. Computer has become an integral part of our Activities of Daily Livings (ADLs) at one hand and prolonged computer usage has increases the risk of occupational hazards at other hand. Prolonged Static work at computer system is a causative factor to lead sedentary life style, poor postural ergonomic, structural derangements and dysfunction commonly at neck, shoulder and low back structures to develop functional limitation and progressively functional disabilities. The basic scope of physiotherapy by means of ergonomic advises and exercise therapy may have efficacy to promote, prevent and cure for such functional Disabilities (FDs). However, internet itself can be a mode of delivering physiotherapy services at workplace to reduce the time & cost together. **Purpose of Study:** To find the efficacy of Telehealth physiotherapy for FDs of the computer users. **Materials:** Internet supported computer, web-site (www.ptmovements.com), web pages, basic health assessment form, Self-Reported FD Questioners, Neck Disability Index (NDI), Back Pain Functional Scale (BPFS), **Study Design:** Experimental Clinical Trial **Methodology:** 1256 computer users (M=867) participated online and assess for inclusive and exclusive criterions. Internet based self-reported FDs questioners used to assess FDs in prior and post to two weeks of tailor made physiotherapy treatment program was introduced. **Data Analysis:**Prevalence of FDs among computer users and impact of Telehealth physiotherapy on FDs by comparing pre and post scores of self-reported questioners was analyzed with SPSS -18, LOS set at 0.05 or CI 95 % **Result:** mild to moderate prevalence of FDs was higher neck & shoulder as compared to low back structures. The Telehealth has shown efficiency to reduce the level of FDs at NDI, and BPFS. **Discussion:** The internet based physiotherapy isto reduce the FDs. The advantage of time & cost effective approach in Telehealth has facilitated keen interest among computer users. **Conclusion:** The Internet Based Physiotherapy Management is well efficient and prospective to develop scopes of "workplace wellness" to promote, prevents, and cures for occupational diseases & disorders. Telehealth physiotherapy has great prospectus in field of modern medicine. [Priyansu R Natl J Integr Res Med, 2019; 10(2):6-11]

Key Words: Telehealth, Functional Disability (FD), Computer Users, Physiotherapy Practice

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Introduction: Internet has a great efficacy in management (assessment and treatment) of FDs of the computer users.¹ The study has authenticated that "Connecting computer via internet has not only reduced the distance between persons but provided the health care system to every individual in the world".^{2,3,4} The study has observed the internet as one of the most convenience method of Physiotherapy Practice approaching every individual at their door step. The study has observed the prolong usage of the computer is responsible for derangements / dysfunction of the neck, shoulder and low back structures to develop functional limitations and so FDs (Fig. 1).^{5,6,7} FD is a difficulty or limitation in performing ADLs.⁸ Untreated and ignored such FDs may lead to pain and loss of function to seek immediate medical attention, increase the medical cost and loss of working hours. The internet has a great efficacy in finding compromised status of ADLs with the self-reported FD questioners.^{9,10} The FD scores are redistributed in mild, moderate and severe

levels of FDs to implements tailor made Telehealth.¹ A strategy of treatment by ergonomic advises and exercises therapy has efficient mode of the Telehealth.^{11,12,13} The Statistical and Clinical significance in changes in post treatment scores suggests efficiency of the Telehealth.¹⁴

Fig: 1 suggesting impact of poor ergonomic on structural derangement and dysfunction⁴⁵



The study has revealed the Internet as a successful tool of modern medicine for promotion, prevention and cure of the musculoskeletal disorders (MSDs).^{15,16} The quality of Care (QOC) and the Quality of Life (QOL) to every individual at his/her doorstep will be the foresight motto of this study. The study has enlighten the scope of Telehealth to empower the e-governance to support modern medical system.¹⁷

Aims of the study is to find the efficacy of the Telehealth physiotherapy of FDs of the computer with following objectives.

1. To evaluate the FDs among the computer users.
2. To evaluate the efficacy of the Telehealth physiotherapy of FDs of the computer users.
3. To emphasis on the analysis of the effects of the Telehealth on FDs.
4. To evaluate the effectiveness of Telehealth at workplaces.

Significance of the Study: The experimental clinical study was designed for the Internet Based Physiotherapy for management (IBPM) of FDs of the computer users. The outcome of the study is to extend efficiency of the IBPM in Health Care Services (HCS) as well as extend the scope of Telehealth Physiotherapy to improve the QOC and the QOL of every individuals. The study will be a pilot work for those researchers and scientists looking to establish the internet based modern physiotherapy practice.^{1,10,18,19,20,21,22,23,24,25,26,27,28}

Review of Related Literature: Corcoran TB¹⁵ has observed the internet as one of the most convenience method of HCS approaching every individual. Jay M. Bernhardt²² has observed "Health Education" is the process to educate people regarding the health.^{1,4} It can be defined as the principle by which individual and groups of people learn to behave in a manner of conducive for the promotion, maintenance, and restoration of health".²⁰

Method of the Delivering Physiotherapy: Cruz-Correia²² has observed that the Face-to-Face physiotherapy has a great impact on learning and training as compared to other methods of the physiotherapy practice. The IBPM is getting popular; however, it needs supporting evidence. Ramesh Farzanfar²⁴ has found information & communication technologies has facilitate collaborative symptom based management and

could potentially increase the reach of such interventions to those who are unable to attend the Face-to-Face health Education or consultation.^{23,30}

Telehealth for Computer Users: Shah PB²⁷ believed that the computer was improving the quality of health care systems as well as the efficiency of the workers on one hand, as one uses computer for many hours continuously, s/he would notice increasing common symptoms of aches and pains in overused structures of neck, shoulder, wrist, and low back on the other hand. Demur B⁴ has admitted that the computer related health problems must be classified under occupational hazards. In last few years significant increase of the computer usage has raised the prevalence of occupational hazards to compromise functional and professional skills.³¹⁻³⁴

Computer Related Health Disorders: Choudhary SBathiar^{17,35,36} has specified that computer related health problems depend on the posture and soft issues related changes and injuries. Hakala PT³⁷ has observed postural integrity depends on structural stability and functional mobility. Prolong usage of computer can compromise the structural stability and functional mobility.^{5,34,26,38} Functional overuse factors are responsible to derange the physiological and anatomical properties of soft tissues including muscles, tendons, ligaments, joints capsule, etc...^{7,8,10,12}

Functional Disability: Ludeke C⁷ have closely observed progression of MSDs among prolong computer users to develop residual FDs to lead serious circumstance.^{7,9,39} Prevalence of FDs among the computer users are significantly increasing following to prolong usage, poor posture and ergonomic.^{8,13}

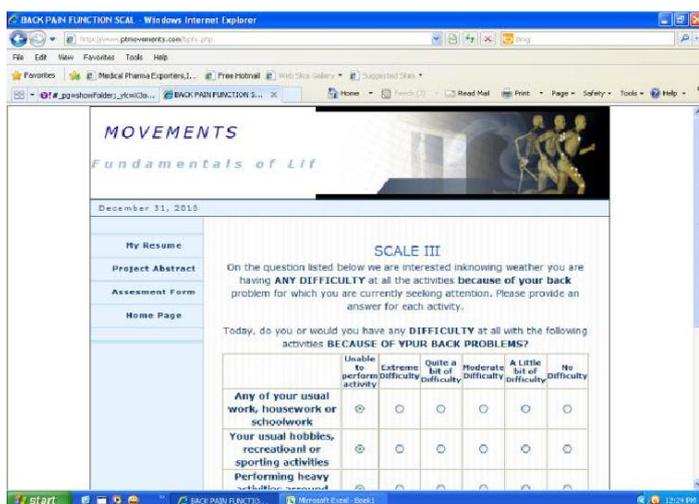
The Telehealth of FDs of the Computer Users: Stratford PW³⁹ and Vernon⁴⁰ have developed various self-reported FD assessment scales and questioners.

The numerical description of such scales make easy to distinguish various levels of FDs as well as severity of symptoms of pain and loss of function. Smith MJ³⁸ has suggested various methods of postural correction and ergonomic changes for prevention of such FDs. Life style modification is one of the essential fragments of treatment program for prevention and cure of FD. Chiu TT² has concluded that prescription of the internet based exercises with diagram and audio-video techniques is well feasible and

mode of treatment to gain structural stability and functional mobility. The Face-to-Face delivery system remains the choice of method, however, the IBPM has an advantage of approaching large population without any constraints of infrastructures, skilled manpower, cost, time, and distance. Moreover, the IBPM system can provide advantage in saving thousands of working hours; cost of health care; meet the deficiency of skilled health care worker, facilitating primary HCS at door-step.^{22,30}

Material and Methods: The Experimental Clinical Trial is implemented by user friendly website. The website www.ptmovements.com was introduced to worldwide computer users by approaching international professional, institutes, universities, colleges, share-markets agencies, professional associations, communities, computer / software industries, as well as placing on the search engines, e-mails, blogs, Facebook, etc.^{16,19,20} The Objectives of the study was well explained on webpage.

Fig: 2 suggesting a webpage of BPFS

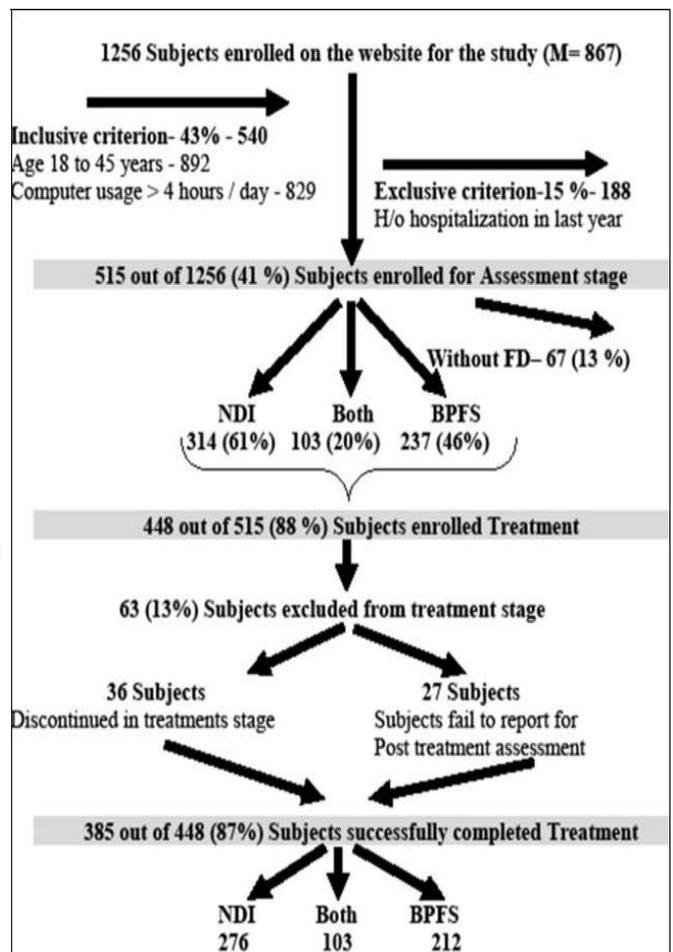


The website access was constructed with guidelines for voluntary participation for the study includes basic health assessment form, self-reported health questioners, feedback forms and treatment procedures etc...^{18,30} subjects were selected at two stages at (1) The Internet Based Health Assessment Procedure and (2) The Internet Based Treatment Procedure. (Flow chart 1).

The Internet Based Health Assessment Procedure of FDs: Basic health assessment form includes basic health information about the subjects, exclusive criterions, and must complete the form to meet the selection criterions to proceed for the Self-reported FD questionnaires Neck Disability Index (NDI) for

neck and shoulder^{9,40,41,42} and Back Pain Functional Scale (BPFS) for low back structures.^{13,39,43} Activity specific FD questionnaires sub-classify all the Subjects in different levels of FDs.

Flow Chart-1 : Data Collection and Result during Assessment and treatment procedure



The Subjects with incomplete assessment forms and without the FDs were excluded from the study. The Self-reported questionnaires are designed to obtain the information to assess how the neck, shoulder and low back pain have affected functional abilities of the Subjects to manage ADLs. The NDI consists of 10 functional activities; each functional activity is scored on a 6-point scale (0-5). Higher score represents more disability. Total score can vary from 0 to 50. The BPFS consists of 12 functional activities; each functional activity is scored on a 6-point scale (0-5). The total BPFS score can vary from 0, the lowest functional level, to 60, the heights functional level.

The Internet Based Treatment Procedure of FDs. Computer users were distributed as per the different levels (mild, moderate and sever) of FDs from the scores of NDI, BPFS and both.² Every

Subject was provided tailor made treatment program through the e-mail, which includes Ergonomic Advise^{5,8,13} and Exercises Prescription.^{24,25,38,43} The website preserves all the data and re-assess with NDI and BPFs after 15 days of the treatment program to find the changes.²¹

Analysis of Data: SPSS ver.18 was utilized for descriptive data analysis. Student Paired Sample t-Test was used to compare the difference of FDs score within and between the two FD Scales (NDI and BPFs). Level of significance set at 0.05 and CI 95 %. Data analysis has done at the following two different stages of the study (1) The Internet Based Health Assessment Procedure of FDs (2) The Internet Based physiotherapy Treatment and Post Treatment Assessment Procedures of FDs

Result and Discussion: Objective I - The (FD) among the computer users: The computer users (38 %) are statistically and clinically fall in mild to moderate level of neck and low back FDs, however, Neck related FDs were significantly higher than low back.

Objective II - Efficacy of TELEHEALTH of the FDs of the computer users: Total 515 out of 1256 subjects (41%) were qualified for the study, however, 385 out of 515 subjects (75 %) had successfully completed the treatment sessions (Flow Chart I) Suggesting, Reaching every individual at their workstation / doorstep for health care system Identifying activity specific pain and functional loss with Self-Reported FD questioners

Objective III - Analysis of the effects of Telehealth of FD of the computer users: The Statistical analysis has shown significant impact of management (assessment and treatment) on FDs. Significant improvement in FD scores of NDI and BPFs. However, the Subjects with FDs at NDI have shown significantly higher improvement as compared to BPFs.

Objective IV - Effectiveness of Telehealth at Workplaces: The Telehealth at workstation / doorstep has shown significant and prospective outcomes for HCS: Right treatment at Right place has greater effectiveness in Telehealth. We have observed great affordability in implementation of Telehealth with Ergonomic advises and Exercise therapy at workplace. Time conserved from visiting or travelling to health care center was

well utilized to perform more precise exercises at workstation.

The Internet Based Health Assessment Procedure of FDs: Basic health assessment form includes basic health information about the subjects, exclusive criterions, and must complete the form to meet the selection criterions to proceed for the Self-reported FD questionnaires Neck Disability Index (NDI) for neck and shoulder^{9,40,41,42} and Back Pain Functional Scale (BPFs) for low back structures.^{13,39,43} Activity specific FD questionnaires sub-classify all the Subjects in different levels of FDs.

Conclusion : The high prevalence of FDs among the computer users has shown serious consequence in personal and professional activities of daily livings (ADLs).

The workplace wellness and Life style modification must be taken into consideration for promotion, prevention, and cure of FDs.

The ergonomic advises and the exercises therapies are precise modes of the internet Based prescription for FDs. However, the outcome remains prospective if executed at workplace.

The scope of the Telehealth has extended the prospectus of the telemedicine by constructing large "data-bank" for meta-analysis for the Evidence Based Practice (EBP) and Clinical Reasoning (CR) for improving the QOC and QOL of every individual.

Thus, The Telehealth physiotherapy is an essential component of primary health care center (PHC) system of every country to maintain the quality of care and the quality of life of every individual. However, the prevalence of the occupational diseases and the disorders are significantly increased in last decade challenging the efficiency of the HCS of every country. Due to scarcity of skilled health care workers, health care centers, cost of transportation, loss of working hours of health workers (and patients) are causative factors challenging "HE". It has been observed that "Internet based HCS will be the promising tool in the era of the modern medicine".

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