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Conference Abstract

The development of telerehabilitation in China: a systematic survey

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Abstract

Background: In China, 70 million people suffer from chronic diseases and call for timely rehabilitation service [1]. This number is estimated to grow over 50% of the whole population by the year 2030 [2]. However, current medical resources cannot meet such huge demand. Furthermore, the distribution of these resources in China is not equal. Most of the rehabilitation professionals are centered in large tier 3 hospitals of the big cities. One of the studies shows that about 56% of local community hospitals do not have department of rehabilitation, and most community rehabilitation professionals are primary physicians, only one-fourth of them receive formal rehabilitation education and training [3]. Telerehabilitation, which provides timely rehabilitation services and education, was hence expected to meet this challenge.

Aim: Through this systematic review, we aimed to understand the status of development of telerehabilitation in China, to discuss whether telerehabilitation is conducive to meet the challenges of Chinese rehabilitation service.

Methods: A systematic review was conducted on the development status of Chinese telerehabilitation. The major representative databases were searched: *PubMed*, *CNKI*, *Wanfang*, and *CQVIP*. Additionally, we searched for published research protocols, conference proceedings and governmental reports on telerehabilitation since 2009.

Findings and discussions: We have identified several large-scale telemedicine systems in China [4]. These systems have established a telecommunication platform for diagnose and supervision between tier 3 hospitals and other smaller hospitals. Patients and doctors hence can seek advice online from experienced rehabilitation specialist distantly. In addition, a growing number of telerehabilitation technologies are emerged in China, such as computer aided rehabilitation evaluation system based on the neural function assessment scale, cognitive rehabilitation training system based on virtual reality technology, exoskeleton remote rehabilitation system based on browser/server structure and rehabilitation robotics [5-12]. This indicates that telerehabilitation technology is receiving a growing attention in China. However, it is suggested that there should be more large scale random control trial in relation to the implementation of the technology. Evaluation on its economic effect should also be performed.

Telerehabilitation can significantly reduce the rate of disability and death due to recurrence, raise enthusiasm of patients during rehabilitation training, and improve motor function and quality of life [13,14]. In terms of improving certain dysfunction, telerehabilitation is better than routine rehabilitation therapy [15-18]. This finding has provided evidences on the clinical benefits of the technology to patients. It is advised that hospitals, as well as the administrations in China should realize the potentials of this type of technology. It is argued that the technology will have a positive effect on minimizing the gap between different regions due to the imbalanced allocation of medical resources [19-21].

Conclusions: Telerehabilitation is very meaningful for the development of Chinese healthcare system, especially on the quality of care and equal distribution of rehabilitation resources. More research with different aspects should be performed to show its significance.

Keywords

telerehabilitation; China; telemedicine; systematic review

References

1. Mi ZX, Cheng J, Cui ZR, et al. Review on organization construction of rehabilitation institution in China. *Chinese Hospitals* 2012;16(6):2-4. [Chinese]
2. Liang J, Lin CJ. Study on community rehabilitation in patients with stroke in China. *Chinese Journal of Rehabilitation* 2012;27(4):316-8. [Chinese]
3. Zhang SM, Du XP, Hu HY. Current situation and countermeasures of community-based rehabilitation. *Chinese General Practice* 2011;14(9A):2918-20. [Chinese]
4. Yu Y, Li ZH, Ding YY, et al. Telemedicine brings opportunities to grass-roots hospitals and its coping. *Radiology Practice* 2014;29(12):1368-70. [Chinese]
5. Fu TF, Bai YH. Progress in design and development of computer evaluation system. *Chinese Journal of Medical Instrumentation* 2013;39(6):441-3. [Chinese]
6. Wang WC, Wang Q, Pang RZ, et al. Design and building of virtual reality technology-based rehabilitation system for patients with cognitive deficits. *Chinese Journal of Rehabilitation Theory and Practice* 2012;18(10):988-990. [Chinese]
7. Qi HB, Diao YF, Yan ZZ, et al. Study on Agent based system of virtual reality assisted cognitive rehabilitation. *Journal of China West Normal University (Natural Sciences)* 2009;30(3):298-301. [Chinese]
8. Li JQ, Wang J, Zhao HW, et al. Research on exoskeleton remote rehabilitation system based on virtual reality technology. *Machine Design and Research* 2011;27(4):35-7. [Chinese]

9. Cui Y, Li JJ, Cong F, et al. Development of comprehensive rehabilitation information system based on browser/server structure. *Chinese Journal of Rehabilitation Theory and Practice* 2015;21(1): 114-6. [Chinese]
10. Song R, Tong KY, Hu X, Li L, Sun R. Arm-eye coordination test to objectively quantify motor performance and muscles activation in persons after stroke undergoing robot-aided rehabilitation training: a pilot study. *Experimental Brain Research* 2013;229(3):373-82.
11. Zeng J, Sun Y, Jiang L. On-line 'automatic pilot' training for hand and arm motor rehabilitation after stroke. *Medical Hypotheses* 2011;37(4):334-42.
12. Song R, Tong KY, Hu XL, Tsang SF, Li L. 2006. The therapeutic effects of myoelectrically controlled robotic system for persons after stroke-a pilot study. In: *Engineering in Medicine and Biology Society. Proceedings of the 28th Annual International Conference of the IEEE, New York, Aug 30-Sep 3 2006.*
13. Nie WL, Nie YF. Observation on the effect of telephone visit to stroke survivors after discharge. *The Medical Forum* 2011;15(8):761-2. [Chinese]
14. Li J, Wu LQ, Shang SL, et al. Efficacy of home telerehabilitation guidance for patients with cerebral infarction. *Chinese Journal of Rehabilitation Medicine* 2012;27(6):572-3. [Chinese]
15. Li J, Wu LQ, Shang SL, et al. Efficacy of home telerehabilitation guidance on activities of daily living and motor function in patients after cerebral infarction. *Chinese Journal of Rehabilitation Theory and Practice* 2011;17(9):887-8. [Chinese]
16. Gu XD, Wu H, Yao YH, et al. Effects of home rehabilitation training system on motor function recovery in hemiplegic patients after stroke. *Practical Journal of Clinical Medicine* 2014;11(5):1-3. [Chinese]
17. Liu AL. Application of the remote network system to the home nursing care of the patients with total knee arthroplasty. *Journal of Qilu Nursing* 2011;17(23):5-7. [Chinese]
18. Liang M, Dou ZL, Wang QH, et al. Application of virtual reality technique in rehabilitation of hemiplegic upper extremities function of stroke patients. *Chinese Journal of Rehabilitation Medicine* 2013;28(2):114-8. [Chinese]
19. Bashshur RL. On the definition and evaluation of telemedicine. *Telemedicine journal : the official journal of the American Telemedicine Association* 1995;1(1):19-30.
20. Kifle M, Mbarika VWA, Datta P. Telemedicine in sub-Saharan Africa: The case of teleophthalmology and eye care in Ethiopia. *Journal of the American Society for Information Science and Technology* 2006;57(10):1383-93.
21. Sangaré M, Tanner L, Voss S, Laureys F, Hollow D, Touré M. A national teleradiology programme in Mali: implementation and results. *Journal of telemedicine and telecare* 2015;21(3):131-8.