Physiotherapy and Occupational Therapy Journal

POTJ

Indexing information: *NLM catalogue & locator plus, USA; Index Copernicus, Poland; EBSCO Publishing's Electronic Databases, USA; Academic Search Complete*, USA; *Academic Search Research & Development, USA; ProQuest, USA; Genamics JournalSeek, OCLC World Cat.*

Corresponding address
Red Flower Publication Pvt. Ltd.
48/41-42, DSIDC, Pocket-II, Mayur Vihar, Phase-I
Delhi - 110 091 (India)
Tel: 91-11-22754205, 45796900, Fax: 91-11-22754205
E-mail: info@rfppl.co.in
Website: www.rfppl.co.in

The Physiotherapy and Occupational Therapy Journal's (pISSN: 0974–5777, Registered with Registrar of Newspapers for India: DELENG/2007/22242) on topics pertaining to physical therapy and rehabilitation. Coverage includes geriatric therapy, pain management techniques, cardiac, orthopaedic and pulmonary rehabilitation, working with stroke patients, occupational therapy techniques and much more. The editorial contents comprise research papers, treatment notes and clinical observations, case histories, professional opinion and memoirs and comments on professional issues. The Editorial Board's mission is to publish significant research which has important implications for physiotherapy and occupational therapy. Our vision is for the journal to be the pre-eminent international publication of the science and practice of physiotherapy and occupational therapy.

Readership: Physiotherapist, Occupational therapists, medical engineers, epidemiologists, family physicians, occupational health nurses etc.

Subscription Information

Individual (1 year): Contact us

Institutional (1 year): INR/USD850

Payment methods

Bank draft / cashier s order / check / cheque / demand draft / money order should be in the name of **Red Flower Publication Pvt. Ltd.** payable at **Delhi**.

International Bank transfer / bank wire / electronic funds transfer / money remittance / money wire / telegraphic transfer / telex

1. **Complete Bank Account No.** 604320110000467
2. **Beneficiary Name (As per Bank Pass Book):** Red Flower Publication Pvt. Ltd.
3. **Address:** 41/48, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091(India)
4. **Bank & Branch Name:** Bank of India; Mayur Vihar
5. **Bank Address & Phone Number:** 13/14, Sri Balaji Shop,Pocket II, Mayur Vihar Phase- I, New Delhi - 110091 (India); Tel: 22750372, 22753401. **Email:** mayurvihar.newdelhi@bankofindia.co.in
6. **MICR Code:** 110013045
7. **Branch Code:** 6043
8. **IFSC Code:** BKID0006043 (used for RTGS and NEFT transactions)
9. **Swift Code:** BKIDINBBDOS
10. **Beneficiary Contact No. & E-mail ID:** 91-11-22754205, 45796900, E-mail: redflowerppl@vsnl.net

Online You can now renew online using our RFPPL renewal website. Visit www.rfppl.co.in and enter the required information and than you will be able to pay online.

Send all Orders to: **Red Flower Publication Pvt. Ltd.,** 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091(India). Phone: 91-11-22754205, 45796900, Fax: 91-11-22754205, E-mail: redflowerppl@gmail.com, Website: www.rfppl.co.in

Physiotherapy and
Occupational Therapy Journal

POTJ

January - March 2016
Volume 9, Number 1

Contents

Indexing information page of Index Copernicus

Editorial

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.1

Systematic Reviews on Spinal Manipulation: What does the Best Evidence about the Best Intervention Gives us?

Senthil P. Kumar*, Asir John Samuel**

Abstract

Spinal manipulation is most rapidly evolving evidence-informed technique and hence it is essential to imply high quality evidence in terms of systematic reviews and/or meta-analyses for this highly popular therapeutic technique. The objective of this short review was to provide an update of systematic reviews and/or meta-analyses on spinal manipulation through a preliminary search of PubMed database. The ten identified systematic reviews were on adverse events, and of them four were on spinal manipulation and six were on cervical spinal manipulation. Majority of systematic reviews on spinal manipulation reported on cervical spine, since the presumed risks due to manipulation of the cervical spine are much more than that of the lumbar spine due to the related neurovascular structures and hence most studies on adverse events concentrated on cervical spinal manipulation.

Keywords: Manual Therapy; Manipulative Therapy; Pubmed; Adverse Events.

Introduction

Manipulation is defined as a "high-velocity low-amplitude technique applied as a unidirectional (non-oscillatory) 'thrust' beyond the restrictive barrier in an attempt to improve the joint mobility and treat joint dysfunction [1]. The technique is not under the volitional control of the patient, and when suitably indicated in selective cases, is to be applied with clinical reasoning [2].

Manipulation is a technique whereas manipulative therapy is a professional specialty, although many authors interchangeably use these terms [3]. Manipulative therapy encompasses manipulation and mobilization for articular, myofascial and neural tissue elements along an impairment-based model of decision-making [4].

Author Affiliation: *Professor, **Asst. Professor, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana (Ambala), Haryana, India.

Reprint Request: Senthil P. Kumar, Professor and Principal, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana-Ambala-133207, Haryana, India.
E-mail: senthilparamasivamkumar@gmail.com

Spine being the most sophisticated in terms of its structure-function inter-relationship and its regional interdependence with somato-visceral/ viscera-somatic associations is the region most commonly involved in dysfunctions [5] either due to abuse, misuse or overuse, resulting in increased application of manipulation/ mobilization for low back pain and neck pain [6].

Low back pain is the most common musculoskeletal complaint for visiting a manual therapist, and neck pain is the third common reason for visiting a healthcare practitioner, and presents the most common indication for receiving conservative treatments in out-patient settings. Common conservative interventions for spinal conditions include mechanical traction[7], segmental stabilization exercise[8], spinal mobilization [9], lateral glide[10], neurodynamics [11], and craniosacral therapy [12].

Spinal manipulation is most rapidly evolving evidence-informed technique and hence it is essential to imply high quality evidence in terms of systematic reviews and/or meta-analyses for this highly popular therapeutic technique. The objective of this short review was to provide an update of systematic reviews and/or meta-analyses on spinal manipulation through a preliminary search of PubMed database.

Adverse Events

Spinal Manipulation

Stevinson and Ernst [13]searched MEDLINE, EMBASE, Cochrane Library and found that minor, transient adverse events such as vertebrobasilar accidents, disk herniation, and caudaequina syndrome occur in 50% of all patients receiving spinal manipulation.

Ernst [14] searched six electronic databases from January 2001 to June 2006 and identified 32 case reports, four case series, two prospective series, three case-control studies and three surveys which reported serious harm on more than 200 patients. Vertebral artery dissection was the most common serious event, and 30%-61% of all patients were reported to have mild adverse effects in two prospective studies. The case-control studies reported a causal association between spinal manipulation and the adverse effect.

Vohra et al [15] searched eight databases and identified 13 studies (2 randomized trials, 11 observational reports) that reported 14 pediatric cases of direct adverse events involving neurologic or musculoskeletal events: "nine cases involved serious adverse events (eg, subarachnoidal hemorrhage, paraplegia), 2 involved moderately adverse events that required medical attention (eg, severe headache), and 3 involved minor adverse events (eg, midback soreness).

Gouveiaet al [16] systematically reviewed two databases (Pubmed and the Cochrane Library)from 1966 to 2007 for safety of chiropractic procedures and identified 46 suitable articles (1 randomized controlled trial, 2 case-control studies, 7 prospective studies, 12 surveys, 3 retrospective studies, and 11 case reports). Life-threatening complications included arterial dissection, myelopathy, vertebral disc extrusion, and epidural hematoma which occurred with a frequency of between 33% and 60.9%.

Cervical Spinal Manipulation

Haldeman et al [17] reviewed the 367 case reports from three databases from 1966-1993 for identifying precipitating events and risk factors for vertebrobasilar artery dissection and 160 cases of spontaneous onset, 115 cases of onset after spinal manipulation, 58 cases associated with trivial trauma, and 37 cases caused by major trauma were reported. The risk factors were hypertension, migraines, use of oral contraceptionandsmoking. Important factors such as offending mechanical trauma, neck movement, or type of manipulation precipitating vertebrobasilar artery dissection or the identification of the patient at risk were not reported in the studies.

Ernst [18] reviewed 31 case reports (42 individual cases) published between January 1995 and September 2001 from five databases (MEDLINE-Pubmed; EMBASE, the Cochrane Library, AMED [Allied and Complementary Medicine Database], and CISCOM [Centralised Information Service for Complementary Medicine]. While most of studies were reported by chiropractors, arterial dissection causing stroke was reported as most common serious adverse event in 18 cases.

Miley et al [19] identified 55 studies out of 169 potentially eligible citations to yield 26 articles- 3 case-control studies, 8 prospective and retrospective case series studies, 4 illustrative case reports, 1 survey, 1 systematic review of observational research, 5 reviews, and 4 opinion and expert commentary pieces. There was weak to moderate strength of evidence for causation between CMT and VAD and associated stroke, especially in young adults (with an Odd's ratio of 5.03 and 1.3/100,000 for people <45 yrs to develop vertebral artery dissection/ stroke within one week of receiving treatment.

Carlessoet al[20] searched five bibliographic databases (PubMed, CINAHL, PEDro, AMED, EMBASE)from 1998 to 2009 and identified 76 citations of which 17 reported no serious adverse events. However, transient neurological symptoms, increased neck pain and 58% of studies did not study adverse events and they were excluded. All studies were associated with small sample size, moderate study quality, and notable ascertainment bias.

Haynes et al [21] followed PRISMA guidelines and searched PubMed, Embase, CINAHL Plus and AMED databases and identified four case-control studies and one case-control study, which included a case- crossover design. With many methodological limitations found in those studies, there was lack of conclusive evidence both for a strong association between neck manipulation and stroke, and for its absence.

Wyndet al [22] reviewed the quality of 43 studies reporting 901 cases of CAD and 707 incidents of stroke after cSMT. Most of studies reported time-to-onset of symptoms and commonly ischemic stroke occurred.

Discussion and Conclusion

We aimed to study systematic reviews and meta-analyses in order to assimilate evidence from highest level of evidence as a 'systematic review of systematic

reviews' perspective. Incidentally, all ten identified systematic reviews were on adverse events, and of them four were on spinal manipulation and six were on cervical spinal manipulation.

The reason why studies on beneficial therapeutic effects were lacking may be due to the 'negative focus' on the technique and its application by various professionals such as osteopaths, chiropractors, physicians and physical therapists. Majority of systematic reviewson spinal manipulation reported on cervical spine, since the presumed risks due to manipulation of the cervical spine are much more than that of the lumbar spine due to the related neurovascular structures and hence most studies on adverse events concentrated on cervical spinal manipulation.

Spinal manipulative therapy through examination is growing in evidence in its normative responses [23], and also in its association with clinical examination methods like pressure pain thresholds [24], and radiological examination such as functional X-ray [25]. More recently, specific clinical prediction rules to identify subgroups of patients who were likely to respond to spinal manipulation were developed based upon treatment-based classification [26].

The future of spinal manipulation lies now in the hands of physical therapists [27], compared to other practitioners to develop the technique in its evolution by establishing more high quality evidence for its effects, efficacy and effectiveness [28] along an evidence-informed paradigm [29] through a symptom control-quality of life continuum of care [30]. The research revolution [31] and its ensuing demand for enhanced role of professional journals for disseminating therapy-related evidence [32] indicated mechanism-based model [33]in order to identify central sensitization [34], cognitive-affective mechanism [35] and sympathetically maintained pain [36] which might not respond to spinal manipulation.

Acknowledgments

None

Disclosure

SPK is the associate editor, and AJS is the editorial board member of this journal.

Conflicts of Interest

None identified and/or declared.

References

1. Maji B, Goyal M, Kumar SP. Immediate effects of thoracic spine thrust manipulation on chest expansion and lung function in healthy subjects- a pre-test and post-test experimental design. Int J Physiother Rehab Med Sci. 2015; 1(1): 1-9.
2. Kumar SP, Kumar A, Sisodia V. Clinical Reasoning and Sports Medicine-Application of Hypothetico-Deductive Model. J Sports Med Doping Stud. 2013; 3: e128.
3. Jamwal NR, Kumar SP. Exploring the Evidence Base for Manual/Manipulative Therapy- a 40-year Trend and Quantitative Synthesis of Articles. Indian J Med Health Sci. 2015; 2(2): 75-86.
4. Kumar SP. Treatment planning and decisions for therapy- how and why? J PhysTher 2011;3(1):1-3.
5. Kumar SP. Musculoskeletal pain- moving from symptoms and syndromes to mechanisms. J PhysTher. 2011; 2(2): 41-5.
6. Kumar SP, Naik S. An emergence of a new era in musculoskeletal physiotherapy- a focused review.Physiotimes. 2011; 2(5): 4-9.
7. Reddy RS, Eapen C, Kumar SP. Efficacy of intermittent cervical traction in the treatment of cervical radiculopathy- A randomized controlled study- Journal of Indian Association of Physiotherapists. 2008; 4(1): 5-9.
8. Kumar SP. Efficacy of segmental stabilization exercise for lumbar segmental instability in patients with mechanical low back pain: A randomized placebo controlled crossover study. North Am J Med Sci. 2011; 3: 456-61.
9. Kumar SP, Cherian PJ. Efficacy of spinal mobilization in the treatment of patients with lumbar radiculopathy due to disc herniation- a randomized clinical trial.Int J NeurolNeurosurg. 2011; 3(2): 29-40.
10. Jamwal NR, Kumar SP. Lateral Thinking in Manual Therapy: The Epitome of Cervical Lateral Glide Technique. Indian J Med Health Sci. 2015; 2(1): 5-8.
11. Kumar SP, Adhikari P, Jeganathan PS, Sisodia V, D'Souza SC, Misri ZK. A Systematic Review on Neurodynamics and Neuropathic Pain in Diabetic Peripheral Neuropathy: Revisiting the Evidence for "Chicken or Egg? Int J NeurolNeurosurg. 2014; 6(2): 15-23.
12. Vaishali K, Tedla JS, Bhat K, Kumar SP, Sisodia V. Craniosacral therapy for pediatric neurodevelopmental disorders- a critical review. Indian J Med Health Sci. 2014; 1(1): 31-3.
13. Stevinson C, Ernst E.Risks associated with spinal manipulation.Am J Med. 2002; 112(7): 566-71.
14. Ernst E.Adverse effects of spinal manipulation: a systematic review.J R Soc Med. 2007; 100(7): 330-8.

15. Vohra S, Johnston BC, Cramer K, Humphreys K.Adverse events associated with pediatric spinal manipulation: a systematic review.Pediatrics. 2007; 119(1): e275-83.
16. Gouveia LO, Castanho P, Ferreira JJ.Safety of chiropractic interventions: a systematic review.Spine (Phila Pa 1976). 2009; 34(11): E405-13.
17. Haldeman S, Kohlbeck FJ, McGregor M.Risk factors and precipitating neck movements causing vertebrobasilar artery dissection after cervical trauma and spinal manipulation.Spine (Phila Pa 1976). 1999; 24(8): 785-94.
18. Ernst E.Manipulation of the cervical spine: a systematic review of case reports of serious adverse events, 1995-2001.Med J Aust. 2002; 176(8): 376-80.
19. Miley ML, Wellik KE, Wingerchuk DM, Demaerschalk BM.Does cervical manipulative therapy cause vertebral artery dissection and stroke?Neurologist. 2008; 14(1): 66-73.
20. Carlesso LC, Gross AR, Santaguida PL, Burnie S, Voth S, Sadi J.Adverse events associated with the use of cervical manipulation and mobilization for the treatment of neck pain in adults: a systematic review.Man Ther. 2010; 15(5): 434-44.
21. Haynes MJ, Vincent K, Fischhoff C, Bremner AP, Lanlo O, Hankey GJ.Assessing the risk of stroke from neck manipulation: a systematic review.Int J ClinPract. 2012; 66(10): 940-7.
22. Wynd S, Westaway M, Vohra S, Kawchuk G.The quality of reports on cervical arterial dissection following cervical spinal manipulation.PLoS One. 2013; 8(3): e59170.
23. Joshi KC, Eapen C, Kumar SP. Normal sensory and range of motion (ROM) responses during Thoracic Slump Test (ST) in asymptomatic subjects. J Manual Manipulative Ther 2013; 21(1): 24-32.
24. Shenoy PD, Eapen C, Kumar SP. Association of pressure-pain threshold and lumbar lordosis in subjects with and without low back pain- a case-control study. Indian J PhysiotherOccupTher. 2013; 7(2): 130-4.
25. Jamwal NR, Kumar SP. Association of manual examination and radiological examination in assessment of lumbar intervertebral instability in asymptomatic subjects- a across-sectional study. PhysiotherOccupTher J. 2015; 8(2): 45-51.
26. Kumar SP, Kumar A. Treatment-Based Classification and Low Back Pain- Sharpening the Two-Edged Sword of Clinical Decision-Making. J Phys Ther. 2013; 8(1): 1-4.
27. Kumar SP. Physical therapy: past, present and future- a paradigm shift. J PhysTher. 2010; 1(2): 58-67.
28. Kumar SP. Effects, efficacy, efficiency, effectiveness of physical therapy- how far are we? J PhysTher. 2011; 3(2): 33-7.
29. Kumar SP. Establishing evidence from practice: Can status of current practice inform future decision-making? Use and misuse of practice-based evidence in Physical therapy. J PhysTher. 2012; 4(2): 45-9.
30. Kumar SP, Jim A. Physical therapy in palliative care: from symptom control to quality of life- a critical review. Indian J Palliat Care. 2010; 16(3): 138-46.
31. Kumar SP. Research (R) Evolution in Physical Therapy- Struggle for existence or survival of the fittest? Physiotimes. 2010; 2(3): 28-30.
32. Kumar SP, Sisodia V, Kumar A. Manual Therapy Journals' Contribution to Evidence-Base in Manual/ Manipulative Physical Therapy- a Quantitative Trend Analysis of Articles. International Journal of Health and Rehabilitation Sciences. 2013; 2(2): 98-108.
33. Kumar SP, Saha S. Mechanism-based classification of pain for physical therapy management in palliative care- a clinical commentary. Indian J Palliat Care. 2011; 17(1): 80-6.
34. Kumar SP. Physical Therapy and Central Sensitization: Are We Explaining to Patients with 'Unexplained' Pain? J PhysTher. 2013; 6(2): 41-5.
35. Kumar SP. Are We (Mis)Understanding the role of Malingering in Non-organic Pain? The Cognitive-Affective Mechanism and its Implications for Cognitive-Behavioral Therapies. J PhysTher. 2013; 7(1): 1-6.
36. Joshi K, Kumar SP. Role of sympathetic nervous system in pain: mechanism-based examination and treatment using physical therapy- a focused review. Int J Neurol Neurosurg. 2012; 4(4): 5-13.

Original Article

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.2

Reference Norms for Functional Gait Assessment Scores in Children with Cerebral Palsy - an Observational Research Study Protocol

Preeti Parashar*, Asir John Samuel**

Abstract

The Functional Gait Assessment (FGA) is a 10-item gait assessment based on the Dynamic Gait Index. Gait disorders are very common in children with cerebral palsy (CP). To document the improvement in the gait of children with CP it is necessary to perform a proper functional analysis of the gait before and after the intervention. The present study will be intended at finding the normal value of FGA in children with CP in the age group from 5 to 12 years.

Keywords: Cerebral Palsy; Children; Gait Assessment; Normal Scores.

Introduction

The assessment of a child with CP before preparation of treatment protocols consist of a combination of medical history, physical examination, functional assessment, medical imaging, observational and instrumented gait analysis, and assessment of patient and family goals [1, 2]. Gait assessment is an important part of the assessment as it will be deciding the ambulatory outcomes. FGA scale has been proved to have acceptable reliability, internal consistency, and concurrent validity over the other balance measures used for vestibular disorder patients. Intraclass correlation coefficients (ICC) has been found to be 0.86 and 0.74 for interrater and intrarater reliability of the total FGA scores and internal consistency of the FGA scores was found to be 0.79 when it was used for subjects with vestibular disorders [3]. FGA is recommended over the Dynamic gait index in adolescent population as it does not assess higher-level balance abilities of adolescents. The FGA (German version) has been proved to be a reliable and valid tool to assess functional gait performance of patients in subacute stages after stroke [4]. There is no published literature yet on the normal values of FGA scores in children with cerebral palsy within age group 5-12 years.

Aim of the Study

The aim of this study is to find out the normal value of FGA scores in children with CP in the age ranging from 5-12 years.

Methods

Participant Recruitment

Diagnosed cases of children having cerebral palsy in age ranging from 5-12 years both males and females will be included in the study. Subjects will be taken from special schools recognized by Rehabilitation council of India (RCI). A pilot study will be performed prior to the study and sample size estimation will be done according to the results of the pilot study. Sampling method will be cluster sampling for the selection of special schools.

Procedure

Children with CP meeting the criteria will be recruited from the special schools. All the required anthropometric measurement will be noted. The children will be given demonstration of the test prior to performing the tests. They will be asked to perform the FGA test and scores will be recorded by the same examiner.

Author Affiliation: *Post Graduate Student, **Assistant Professor, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar University, Mullana-133207. Haryana India.

Reprint Request: Asir John Samuel, Assistant Professor, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation, Maharishi Markandeshwar University, Mullana-133207. Haryana India.
E-mail: asirjohnsamuel@mmumullana.org

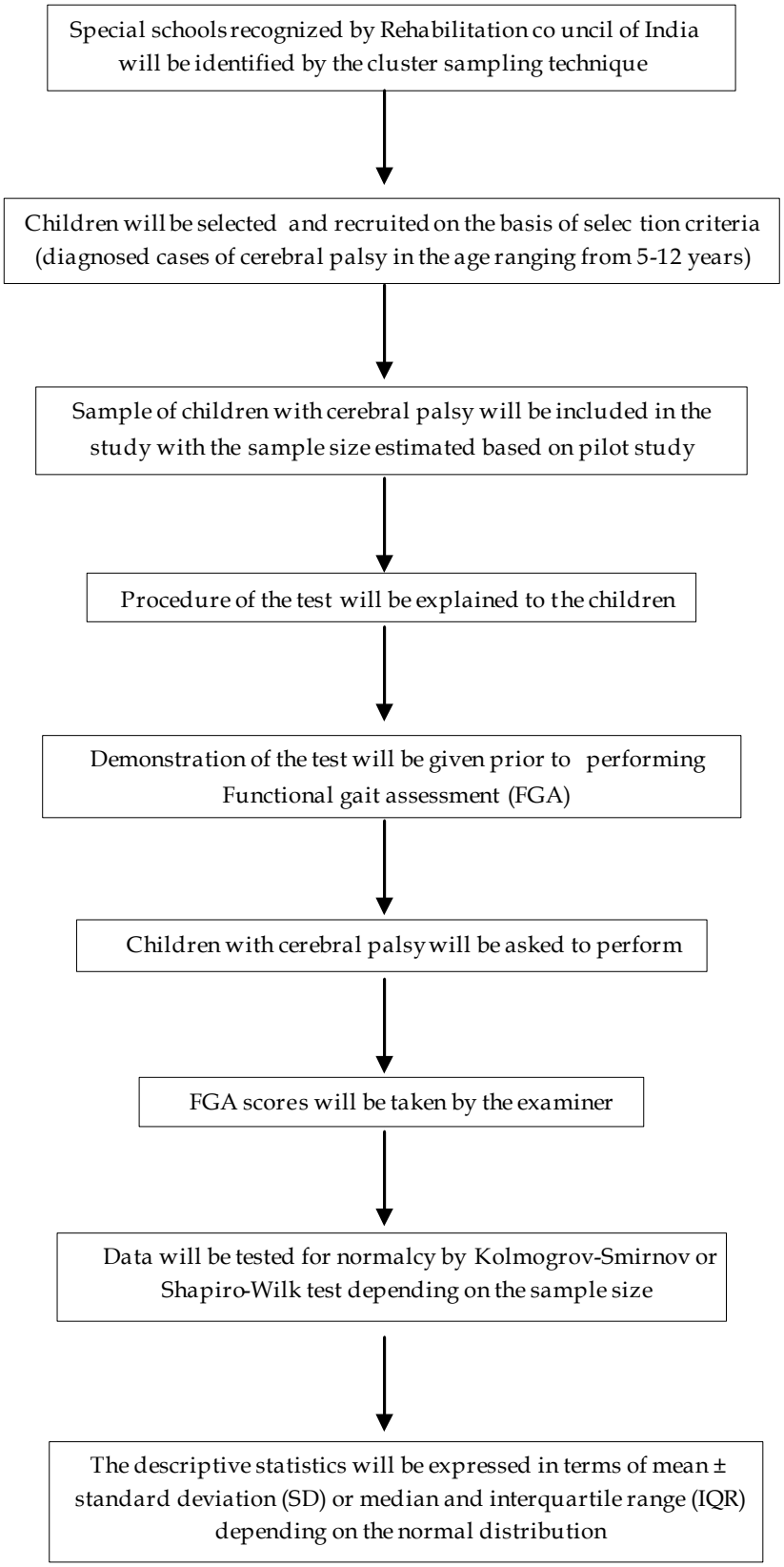

Fig. 1: Study protocol and procedure

Data Analysis

Kolmogrov-Smirnow or Shapiro Wilk test will be used to establish the normality of collected data depending on the sample size. The descriptive statistics will be expressed in terms of mean ± standard deviation (SD) or median and interquartile range (IQR) depending on the normal distribution. For all the above analysis, the level of significance will be set at $p<0.05$ to minimize type I error. The statistical package for social sciences software version 16.0 (SPSS, version 16.0 Inc., Chicago, IL) will be used for data analysis.

Discussion

Gait analysis has been found helpful in improvement of outcomes when its recommendations are incorporated in the treatment plan[5]. In children gait changes with motor development and requires frequent observations to track progress effectively. The use of validated measurements of gait and balance are very important to establish baseline function and assess effectiveness of therapeutic interventions [6]. The present study will provide the reference value of FGA scale to be used in children with CP in the age ranging from 5-12 years. Further, on establishing the responsiveness of FGA test, it will also be used to assess the efficacy of various therapeutic interventions as functional assessment can help in tracking improvements during rehabilitation regimens. Thus FGA could be effectively used to monitor treatment efficacy in children with gait abnormalities.

Conclusion

The study may help in establishing the reference values of FGA scale in children with CP in the age ranging from 5-12 years which may be used as the standard norms among them.

References

1. Bella GP, Rodrigues NB, Valenciano PJ, Silva LM, Souza RC. Correlation among the Visual Gait Assessment Scale, Edinburgh Visual Gait Scale and Observational Gait Scale in children with spastic diplegic cerebral palsy. Rev Bras Fisioter. 2012; 16(2): 134-40. English, Portuguese. doi:10.1590/S1413-35552012000200009. PubMed PMID: 22584771.
2. Johari R, Maheshwari S, Thomason P, Khot A. Musculoskeletal Evaluation of Children with Cerebral Palsy. Indian J Pediatr. 2016 Jan 23. [Epub ahead of print]. doi:10. 1007/ s12098-015-1999-5. PubMed PMID: 26801500.
3. Wrisley DM, Marchetti GF, Kuharsky DK, Whitney SL. Reliability, internal consistency, and validity of data obtained with the functional gait assessment. Phys Ther. 2004; 84(10): 906-18. PubMed PMID: 15449976.
4. Thieme H, Ritschel C, Zange C. Reliability and validity of the functional gait assessment (German version) in subacute stroke patients. Arch Phys Med Rehabil. 2009; 90(9): 1565-70. doi: 10.1016/ j.apmr.2009.03.007. PubMed PMID: 19735785.
5. Wren TA, Lening C, Rethlefsen SA, Kay RM. Impact of gait analysis on correction of excessive hip internal rotation in ambulatory children with cerebral palsy: a randomized controlled trial. Dev Med Child Neurol. 2013; 55(10): 919-25. doi: 10.1111/ dmcn.12184. Epub 2013 Jun 6. PubMed PMID: 23738949.
6. Guffey K, Regier M, Mancinelli C, Pergami P. Gait parameters associated with balance in healthy 2- to 4-year-old children. Gait Posture. 2016 Jan; 43: 165-9. doi: 10.1016/j.gaitpost.2015.09.017. Epub 2015 Sep 30. PubMed PMID: 26439183; PubMed Central PMCID: PMC4681623.

Physiotherapy and Occupational Therapy Journal

Library Recommendation Form

If you would like to recommend this journal to your library, simply complete the form below and return it to us. Please type or print the information clearly. We will forward a sample copy to your library, along with this recommendation card.

Please send a sample copy to:

Name of Librarian

Name of Library

Address of Library

Recommended by:

Your Name/ Title

Department

Address

Dear Librarian,

I would like to recommend that your library subscribe to the **Physiotherapy and Occupational Therapy Journal**. I believe the major future uses of the journal for your library would provide:

1. useful information for members of my specialty.
2. an excellent research aid.
3. an invaluable student resource.

I have a personal subscription and understand and appreciate the value an institutional subscription would mean to our staff.

Should the journal you're reading right now be a part of your University or institution's library? To have a free sample sent to your librarian, simply fill out and mail this today!

Stock Manager

Red Flower Publication Pvt. Ltd.

48/41-42, DSIDC, Pocket-II, Mayur Vihar, Phase-I

Delhi - 110 091 (India)

Tel: 91-11-22754205, 45796900, Fax: 91-11-22754205

E-mail: redflowerppl@gmail.com, customer.rfp@rfppl.co.in

Website: www.rfppl.co.in

Original Article

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.3

The Effect of Mode of Instructions on Training of Wheelchair Curb Negotiation and Transfers in Paraplegics

Madhurima Shukla*, Jaskirat Kaur**

Abstract

Background and purpose: The principles of motor learning have been used in neuro-rehabilitation for the learning and re-learning of a skill. Wheelchair skill training is one such aspect in the field of neuro-rehabilitation. As dependence on wheelchair is an important part of daily life in majority of persons with spinal cord injury an effective method of training wheelchair skills is important. The purpose of this study was to evaluate the effects of video and verbal modes of instructions on training of three important wheelchair skills. *Methods:* 30 participants with paraplegia were recruited into two groups randomly. Group one received video instructions and group two received verbal instructions for three wheelchair skills; ascending 10cm curb, descending 10cm curb and transfers. participants were given a maximum of five day training sessions. Each task was trained for 20min daily, until passed. Total training time as well as training time for each task was recorded. Success rate for both the groups was also calculated. *Results:* The video instruction group required significantly less training time as compared to the verbal instruction group for training of the three wheelchair skills. However, the success rate for both the groups came out to be 100 percent. *Conclusion:* This study provides the evidence that video mode of instruction is effective in terms of time for training of wheelchair skills in persons with spinal cord injury.

Keywords*:* Motor Learning; Curb Negotiation; Transfer; Spinal Cord Injury.

Introduction

The learning of motor skills can be characterized by the continuous interaction of cognitive and sensory processes with the motor processes. There is consistent evidence that motor skill performance and learning can be enhanced by giving learners instructions that direct their attention to the effects of their movements[1]. The principles of motor learning have been used for learning or re-learning of a skill [2-7]. Wheelchair skill training is one such aspect in the field of neuro-rehabilitation.

Wheelchair is among the most important therapeutic tools in rehabilitation [8-11]. Environment and personal factors as well as lesion characteristics, impact wheelchair skill performance during and after inpatient rehabilitation [12]. A thorough mastery of wheelchair skills, combined with optimal physical capacity, can enhance mobility. Increasing physical capacity and specific wheelchair skills therefore are important goals of rehabilitation especially after SCI [13]. For many people with spinal cord injury , a wheelchair is the primary means of locomotion [15]. For these persons, wheelchair use is conditional to achieve independent mobility [14]. To function independently , manual wheelchair users must possess a variety of wheelchair skills , enabling them to deal with the physical barriers they will inevitably encounter in various environments [12-14]. Thus, mastering wheelchair skills can make the difference between dependence and independence in daily life [12-14].

However, the means by which skill acquisition and modification occurs has been the primary concern of the motor learning theorists for many years [16]. According to Newell, Magill and McCullough and Weiss, any task related information provided to the learner plays an important role in motor skill acquisition. This information can be given before the movement in the form of verbal instruction or model

Author Affiliation: *Physiotherapist, St. Stephen's Hospital Marg, Tis Hazari, New Delhi, India 110054. **Assistant Professor, MPT (Neurology), ISIC Institute of Rehabilitation Sciences, Vasant Kunj, New Delhi 110070, India.

Reprint Request: Jaskirat Kaur, Assistant Professor, MPT(Neurology), ISIC Institute of Rehabilitation Sciences, Sector C Vasant Kunj New Delhi-110070.
E-mail: drjaskirat24@gmail.com

demonstrations [17]. Modeling is the primary process by which individuals imitate the observed behavior of others and potentially obtain performance proficiency with the observed behavior by doing so. Coaches' rank modeling among the most frequently used means to enhance performance. Continuing advances in video and digital technology have resulted in progressive ease and economic efficiency in using video and computer equipment for modeling [18].

There is evidence to suggest that verbal cueing will facilitate skill acquisition beyond that permitted by visual observation alone. Early research in sport pedagogy illustrated that verbal instructions are among the most common teaching behaviors (McKenzie et al). Furthermore, Newell documented that the verbal modality is especially helpful in developing recognition memory. In line with this suggestion, verbal instructions have been shown to be beneficial to the sequencing of skills during task performance [18]. However, despite good progress, there has been relatively little scientific study to date on the optimum method of teaching wheelchair skills [19]. Out of these one important but potentially dangerous skill is the curb ascent [20]. Also throughout the course of a day an individual with a spinal cord injury is required to move or transfer between his wheelchair and various surfaces including bed, chair, tub, commode, and car. Therefore, learning to perform transfers is a vital component in the rehabilitation of any patient with an SCI [21].

This study focuses on comparing the effect of video and verbal mode of instructions on training of three important wheelchair skills- curb ascent, curb descent, transfers.

Methods

Selection and Description of Participants

Thirty spinal cord injury patients were recruited from Indian spinal injury center, New Delhi, in this study. To participate, participants had to meet the following criteria: 1) participants with spinal cord injury, resulting in paraplegia [12,22]. 2) participants with ASIA impairment grade A,B,C or D [14]. 3) participants with age between 18-50 years [12]. 4) Body size that fits the wheelchair being used [20,24]. 5) Able to perform forward and reverse propulsion, right and left turns and a 5 degree incline ascent to ensure that subject had at least moderate strength , skill and coordination needed for the tasks [20,24]. 6) Untrained in transfers and curb climbing determined by the components of Wheelchair skills test. 7) participants who were able to understand either English or Hindi language 8) participants should have a good sitting balance [25-26]. 9) Alert, cooperative and able to follow the instructions and who have given informed consent.

Procedure

A post test only experimental design was used. The study was in accordance with ethical guidelines and was approved by institutional review board. The participants were invited to participate in the study and then were randomly divided into two groups- Group 1: Video Instructions group, Group 2: Verbal Instructions group. Each group consisted of 15 participants. A detailed explanation of the procedure was given to the patients after which they signed the informed consent.

All participants were given a standardized wheelchair for the practice sessions and retention tests. The participants were trained on three tasks (acquired from the Wheelchair Skills Training Program version 1.0)10: ascending 10cm curb, descending 10cm curb, and transfer from wheelchair to bench and back. On day 1 before the training for 3 tasks began the participants were given a brief description about the wheelchair and its parts. A general introduction of the tasks was then provided to all the participants followed by the demonstration of the tasks by a trained therapist irrespective of their groups.

Training Protocol

The three tasks were trained on the same day. For each task the participants attended a maximum allowable of five days training sessions. Each training session lasted for 60 minutes or less (20minutes for each task). There was a single trainer for both groups. Each training session began and ended with warm-ups and cool-downs which included rolling forward and backward, left and right turns. Warm-up was followed by training of the tasks. Each of the 3 tasks was trained for approximately 20minutes. The groups received instructions based on their divisions: Group 1- Video instruction group, watched a silent video of a trained therapist performing the tasks, Group 2 –Verbal instruction group, and listened to the audio track of the instructions for the tasks. Each of the 20 minute periods of the training session for the individual task was divided into four 5 minute periods. Each period began with video demonstration for Group 1 and verbal instructions for Group 2 (taking up to 1 min) followed by the practice of the task (for the remaining

4-5min). Feedback was provided in the form of knowledge of results at the end of each period. After last period of the session a final test for that task was done. When a particular task was safely and successfully performed the training ceased, the time was recorded & retention test was scheduled.

Retention Test

The retention test was administered at least 2 days after completing the training on a particular task.[24] The tester was different from trainer and blinded to the particular training method. Success consisted of the subject performing the task successfully and safely twice consecutively. If the participants passed the first retention test then his involvement in the study was complete. If the participant failed the first retention test then they were referred back to the trainer for further training if they had not already had a total of five day training sessions. If successful during this subsequent training, a second and final retention test was scheduled. Regardless of the result of second retention test, the participant's involvement was complete [20,24]. A participants were considered successful only if he passed all the 3 tasks.

The training time was noted and after all the participants participation was over, success rate was calculated for the group. At the end of the training the participants were required to rate their perceived effectiveness of the given mode if instruction on a 0-100 percent scale.

Statistics

Statistics was performed using SPSS software version 10.5.

Results

Comparison of Training Time for Task 1(Curb Ascent)

The analysis of Task 1 shows that the mean training time for the task for Group 1 is 60min and that for Group 2 is 66.67(±9.76) min. Since there was no variance for number of sessions and training time in Group 1, the standard deviation for this group could not be calculated, thus the t-value for Task 1 could not be calculated. (Figure 1)

Comparison of Training Time for Task 2(Curb Descent)

The analysis of Task 2 shows that mean training time for the task for Group 1 is 40min and that for Group 2 is 42.67(±7.04) min. (Figure 1)

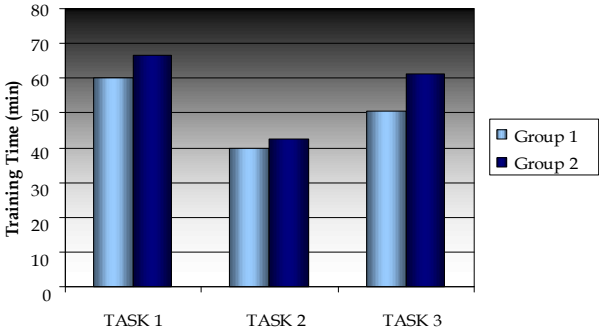

Fig. 1: Comparison of training time for Task 1 , Task 2 and Task 3 between Group 1 and Group 2

Group 1: N=15, Video Instructions Group
Group 2: N=15, Verbal Instructions Group
Task 1: Ascending 10cm curb
Task 2: Descending 10cm curb
Task 3: Transfers

Comparison of Training Time for Task 3(Transfers)

The analysis of Task 3 shows that there was a significant difference in the training time for the task for Group 1 (Mean=50.67±10.33 min) and Group 2 (Mean=61.33±5.16 min), with t=3.58 and p=.001. (Table I, Figure 1)

Comparison of Total Training Time (Task 1, 2 and 3)

The analysis of total training time shows that there was a significant difference between Group 1 (Mean=150.67±10.33 min) and Group 2 (Mean=170.67±12.79), with t=4.71 and p=.001. (Table II, Figure 2)

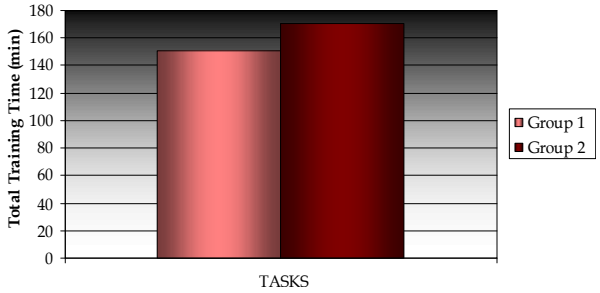

Fig. 2: Comparison of total training time between Group 1 and Group 2

Group 1: N=15, Video Instructions Group
Group 2: N=15, Verbal Instructions Group

Success Rate

All the participants in both the groups were successful in learning all the three tasks. Hence, the success rate was 100 percent for both the groups.

Comparison of Patient's Perception for Effectiveness of the Given Mode of Instruction

There was no significant difference between the groups for patient's perception about the effectiveness of the given mode of instruction, determined by VAS in which the patient had to rate the effectiveness on a 0-100 percent scale. For Group 1 (Mean=86.33±4.42percent) and Group 2 (Mean=85±4.22percent), with t=.84 and p=.405. (Table III, Figure 3)

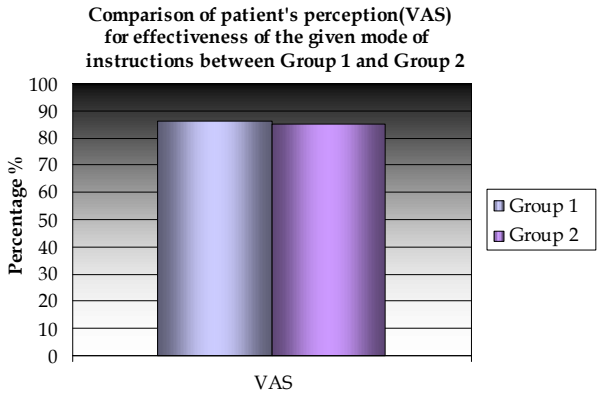

Fig. 3: Comparison of VAS between Group 1 and Group 2

Group 1: N=15, Video Instructions Group
Group 2: N=15, Verbal Instructions Group

Table 1: Comparison of training time for Task 3 (Transfers) (TT3) between Group 1 and Group 2

Variable	Group 1 N=15		Group 2 N=15		t-value
	Mean	S.D	Mean	S.D	
TT3 (in min)	50.67	10.33	61.33	5.16	3.58*

*Significant at pd≤0.05

Table 2: Comparison of total training time (TTT) between Group 1 and Group 2

Variable	Group 1 N=15		Group 2 N=15		t-value
	Mean	S.D	Mean	S.D	
TTT (in min)	150.67	10.33	170.67	12.79	4.71*

*Significant at pd≤0.05

Table 3: Comparison of patient's perception (VAS) for effectiveness of the given mode of instructions

Variable	Group 1 N=15		Group 2 N=15		t-value
	Mean	S.D	Mean	S.D	
VAS	86.33	4.42	85.00	4.23	0.84^{NS}

NS- Non-significant

Discussion

In the present study three important wheelchair tasks: ascending 10cm curb, descending 10cm curb, and transfers were used. The patients were divided into 2 groups; Group 1 was the video instruction group, in which the patients watched a silent video of a trained therapist performing the tasks and Group 2 was the verbal instruction group, in which the patient listened to the audio track of the instructions for the task The three task used in the study were chosen because they are important [20,21] and easy to teach. The safety of the patients was given utmost importance, the therapist stood beside the patient during transferring task and a spotter strap [36] was used during curb negotiation to prevent the patients from tipping backwards. A silent environment was preferred for the training sessions.

For task 1 (ascending curb), group 1 on an average required 60 min of training time whereas, group 2 required an average of 66.67 min of training time. This might have happened because a proper technique of curb climbing requires effective hand placements on the hand rims [25] of the wheelchair in order to apply effective forces and move the wheelchair, especially during the pop up phase in which the casters are popped onto the curb and the curb ascend phase in which the rear wheels are brought onto the curb. These important hand placements though given in the verbal instructions

might not have been effectively conveyed to the verbally instructed group, but the participants in the video instruction group might have well grasped it on seeing it. However this cannot be solely attributed to the mode of instructions alone, as this task requires a lot of strength.

It was seen that the task 2 (descending curb) was learnt early and at equally the same time by both the groups. Group 1 required an average of 40 min and group 2 required an average of 42.67min of training time. This might be because descending curb is a relatively easy task and requires lesser strength and coordination. All the participants were able to learn this task in 2 training sessions except two participants in group 2 who completed the task in 3 sessions. This might be attributed to certain subjective factors, as one of these patients reported feeling of fatigue during the training sessions.

For task 3 (transfers), a significant difference was found between the two groups on training time. Group 1 on an average required 50.67min of training time, whereas group 2 required an average of 61.33 min of training time. This might be because the task of transferring has a number of subcomponents to it. These subcomponents might have been easily grasped and remembered by the video instructed group as compared to the verbally instructed group as the patient might have got confused by so many steps and components of the task and hence leading to more time required to pass the task.

When compared on total training time required for all the three tasks, there was a significant difference between the two groups. The patients in group 1 required an average of 150.67 min of training time and that in group 2 required an average of 170.67 min of training time. This might have happened because the learners have a limited capacity to attend [19] and the participants might have got overwhelmed and confused by the amount of information given to them by verbal instructions and hence might have missed upon certain important aspects of the technique required for the task. Whereas the video instructed participants might have grasped the important aspects of the technique, hence requiring lesser training time as compared to the verbally instructed group. The results of this study are supported by the study results of Saleh A. Al-Abood and K.Davids but the task used there was a dart-aiming task [16].

Also, it was found that the participants in both the groups were equally successful in all the three tasks. Hence both the groups had a success rate of 100 percent.

Finally for getting an insight into the patient's perception of the effectiveness of the given mode of instruction a VAS was administered, in which the patient had to rate the effectiveness of the mode of instruction given to them on a 0-100 percent scale. It was found that there was no significant difference between the two groups for the perceived effectiveness, but in general the patients in the video instruction group told that they quite enjoyed their training sessions.

References

1. Eling D de Bruin, Jaap Swanenburg, Elsbeth Betschon. A randomized controlled trial investigating motor skill training as a function of attentional focus in old age. BMC Geriatrics. 2009; 9: 15.
2. Carolee J. Winstein. Knowledge of results and motor learning- Implications for physical therapy. Phys Ther. 1991; 71: 140-149.
3. Carolee J. Winstein, Alan M. Wing, Jill Whitall. Motor control and learning principles for rehabilitation of upper limb movements after brain injury. Handbook of Neuropsychology, J. Grafman and I.H. Robertson, 2003; Edition 2:77-137.
4. John W. Krakauer. Motor learning: its relevance to stroke recovery and neurorehabilitation. Current Opinion in Neurology. 2006; 19: 84-90.
5. Robert E. Hanlon. Motor Learning Following Unilateral Stroke. Arch Phys Med Rehab. 1996; 77: 811-815.
6. Nancy H. McNevin, Gabriele Wulf, Christine Carlson. Effects of attentional focus, self-control, and dyad training on motor learning: implications for physical rehabilitation. Phys Ther. 2000; 80: 373-385.
7. Henk van Dijk, Michiel J. A. Jannink, Hermie J. Hermens. Effect of augmented feedback on motor function of the affected upper extremity in rehabilitation patients: a systematic review of randomized controlled trials. J Rehab Med. 2005; 37: 202-211.
8. Krista L. Best, R. Lee Kirby, Cher Smith. Wheelchair skills training for community based manual wheelchair users: A randomized controlled trial. Arch Phys Med Rehab. 2005; 86: 2316-2323.
9. Anna L. Collen, R. Lee Kirby, Jennifer Landry. Wheelchair skills training program for clinicians: A randomized controlled trial with occupational therapy students. Arch Phys Med Rehab. 2004; 85: 1160-1166.
10. R. Lee Kirby, Janneke Swuste, Debbie J. Dupis. The wheelchair skills test: A pilot study of a new outcome measure. Arch Phys Med Rehab. 2002; 86: 10-18.
11. Matthew D. F. McInnes, R. Lee Kirby, Donald A.

MacLeod. The contribution of vision to wheelie balance. Arch Phys Med Rehab. 2000; 81: 1081-1084.

12. Olga Kilkens, Annet J. Dallmeijer, Edmond Angenot. Subject and injury related factors influencing the course of manual wheelchair skill performance during initial inpatient rehabilitation of persons with spinal cord injury. Arch Phys Med Rehab. 2005; 86: 2119-2125.
13. Olga J. Kilkens, Marcel W. Post, Annet J. Dallmeijer. The wheelchair circuit: reliability of a test to assess mobility in persons with spinal cord injuries. Arch Phys Med Rehab. 2002; 83: 1783-1788.
14. Olga J. Kilkens, Annet J. Dallmeijer, Lue P. de Witte. The wheelchair circuit: construct validity and responsiveness of a test to assess manual wheelchair mobility in persons with spinal cord injury. Arch Phys Med Rehab. 2004; 85: 424-431.
15. Barbara Hughes, Bonita J. Sawatzky, Adrienne T. Hol. A comparison of spinergy versus standard steel-spoke wheelchair wheels. Arch Phys Med Rehab. 2005; 86: 596-601.
16. Saleh A. Al-Abood, Keith Davids, Simon J. Bennett. Specificity of task constraints and effects of visual demonstrations and verbal instructions in directing learner's search during skill acquisition. J Mot Behav. 2001; 33(3): 295-305.
17. Patricia L. Laguna. Task complexity and sources of task related information during the observational learning process. J Sports Sci. 2008; 26(10): 1097-1113.
18. Christopher M. Janelle, Jamy D. Champenoy, Stephen A. Coombes. Mechanisms of attentional cueing during observational learning to facilitate motor skill acquisition. J Sports Sci. 2003; 21: 825-838.
19. Wheelchair Skills Program manual. Version 4.1. Available at http://www.wheelchairskill sprogram.ca.
20. R. Lee Kirby, Sean Bennett, Cher Smith. Wheelchair curb climbing: randomized controlled comparison of highly structured and conventional training methods. Arch Phys Med Rehab. 2008; 89: 2342-2348.
21. Sue Ann Sisto, Erica Druin, Martha Macht Sliwinski. Transfer techniques. Spinal Cord Injuries: Management and Rehabilitation, Elsevier: 185-208; 2008.
22. Claire E. Beekman, Leslie Miller-Porter, Marion Schoneberger. Energy cost of propulsion in standard and ultralight wheelchairs in people with spinal cord injuries. Phys Ther. 1999; 79(2): 146-158.
23. Kirby RL, Gillis DJ, Bourdreau AL. Effect of high rolling resistance training method on success rate and time required to learn the wheelchair wheelie skill: A randomized controlled trial. Am J Phys Med Rehab. 2008; 87(3): 204-211.
24. Martha Freeman Somers. Transfers, Wheelchair skill. Spinal Cord Injury: Functional Rehabilitation, Appleton and Lange, 101- 230; 1992.
25. Chiung Ling Chen, Kwok Tak Yeung, Liu Ing Bih. The relationship between sitting stability and functional performance with paraplegia. Arch Phys Med Rehab. 2003; 84: 1276-1281.

Original Article

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.4

Effects of Temperature on Elbow Flexor Muscles (Biceps) Endurance

Sumit Kalra*, Nidhi Kalra*, Davinder K. Gaur*, Savita Tamaria*

Abstract

Background: Body temperature is other biologinal factor , which is known as an important indicator of muscles function. The aim of this study was to investigate the effects of temperature on elbow flexor (Biceps) muscles endurance. *Methods*: 40 male subjects (22.77±2.11, mean height of 174.99±7.57 cm and mean weight of 63.77±6.45 kg) participated in the present study. The biceps muscles endurance was measured before and after applying ice and hot packs over the forearm for 15 minutes. *Results*: The results showed a significant increase in biceps muscles endurance after heating. (r=0.57, p=0.001). it was found that, cooling the muscles leaded to significant decrease of biceps muscle endurance (P=0.214).*Conclusion*: These results suggest that elbow flexors is temperature sensitive. Therefore, further studies are needed to evaluate the effects of Heat and cold on muscular function in people working in workplaces with extreme temperature like many other biological factors, body temperature is known as an important indicator of muscles function.

Keywords: Elbow Flexor Muscles; Temperature; Muscle Strength; Endurance.

Introduction

Increasing the muscle temperature affects the contractile characteristics of muscles including rate of force production and relaxation as well as contractile velocity [1].

Most previously published measurements of the power output of skinned mammalian muscle fibres have been made at temperatures below 20°C. Power output is known to be very temperature sensitive, so it is not surprising that most of the earlier measurements are well below the value of about 100 W kg^{-1} at 20°C which West et al.found for both the rabbit and cheetah fibres (red square and red cross). The only published value for skinned fibres at temperature higher than 20°C is for rat fibres at 30°C, which produced power of 166 W kg^{-1} [2].

According to Budoff Je [1],Fry, Ac, et al [2]. Smith,T,et al [3], and Yasuo, G, et al [4], Many daily functions and sporting events require high activity levels of the flexor musculature of the forearms and hands. These are the muscles involved in gripping strength. From sports like tennis and baseball to daily activities such as carrying laundry, turning a doorknob, and vacuuming, some degree of grip strength is necessary to be successful. For example, without adequate grip and forearm strength, tennis players may run the risk of developing lateral epicondylitis, otherwise known as tennis elbow. Often overlooked or taken for granted, the strength of one's grip plays a key role in injury prevention and overall strength development. The same is the case with cricket bat gripping and upper body strength, where if not properly done the players may run the risk of developing injury risk [3-5].

In addition, warming the whole body affects the blood flow to the central parts of the human body and lessens the dynamic training capacity and muscles endurance. Furthermore, it may also impose an extra load to the cardiovascular system so as to meet the activated muscles biological needs .The high temperature environment might altered motor units firing rate as well. It is happened by improving the rate of force development and relaxation in higher temperatures in comparison with lower temperatures. Motor units firing rate is determined as a predictor for the amount of muscles force production. Therefore, the human body reduces its muscles force

Author Affiliation: *Assistant professor, Banarsidas Chandiwala institute of Physiotherapy, New Delhi.

Reprint Request: Sumit Kalra, Assistant Professor, Banarsidas Chandiwala institute of Physiotherapy, Kalkaji, New Delhi, Delhi 110019.
E-mail: sumitdrpt@gmail.com

in order to protect the whole body from the probable injury of extra heating. Nonetheless, heat is commonly used in physiotherapy and sport training to enhance muscular capability [6-7].

Temperature is an important determinant of skeletal muscle function. Like most biological processes, skeletal muscle contraction is temperature sensitive. It has been known that important parameters like maximal isometric force production, the rates of force development and relaxation and maximal power production strongly depend on temperature. A greater muscle blood flow with elevation of intramuscular temperature would increase oxygen supply, thus potentially improving muscle function [8].

Physical therapists clinically use hot pack to decrease the muscle pain and spasm and to increase the extensibility of soft tissues; also, cold pack has been used for the treatment of acute musculoskeletal injuries. The relationship between local tissues 1.

Methods

A total of 40 Participants were recruited from the general community with age group 20-25 years male. The whole procedure was completely explained to them and they signed the informed consents prior to participating to the study.

Participating in any regular sport or gym activity and any history of traumatic injury, neurological disorders, skin disorders, to upper extremities were recognized as exclusion criteria. Sport and gym activity considered as exclusion criteria to diminish any confounding effects of muscle tolerance to increase the temperature.

Participants were asked to sit on a chair, put their forearms on the armrest in a way that shoulder adducted and in neutral rotation, elbow neutral, forearm supinated and wrist in 0^0 extension. The subjects were asked to squeeze the dynamometer three times, for the testing positions with 1-minute resting period between each trial in order to overcome fatigue. To measure the strength of elbow flexors after taking all 3 readings we calculated the mean of the readings. The final mean strength was noted for data analysis. After a 10 to 15 minute rest, participants Then, a 40-42 degree hot pack was applied biceps muscle for 15 minutes. Afterwards, same procedure was applied for measurement of strength /endurance of elbow flexors with a 2-day wash out, the procedure was conducted again on the same participants. Although in the second session participants' forearms were exposed to an ice pack cooled in refrigerator temperature (0 centigrade degree). Before and immediately after the 15-minute ice application, elbow flexor muscle endurance was assessed. A methodological study has been conducted prior to the main procedure to evaluate the intra examiner reliability for measuring the endurance of elbow flexor muscles in which the muscle endurance was measured two times, one day apart, prior to the performing the main study

Results

The male subject selected in the study had a mean age of 22.77±2.11, mean height of 174.99±7.57 cm and mean weight of 63.77±6.45 kg.

The Effect of Temperature on Elbow Flexor Muscles Endurance

	Pre	Post Heating	Post Cooling
Elbow flexor muscles endurance	38.99±5.66	40.66±6.5	36.33±5.43
Skin Temperature (c°)	37.3±0.25	38.7±28	34.33±1.07

For correlation of hot application and muscle endurance (r=0.57, p=0.001) which means that application of hot will increase muscle endurance as compare to application of cold (r=.233, p=.214).

The paired t-test revealed that applying hot pack induce a significant increase in the muscle endurance (P=0.001) while the application of ice pack reduced the muscle endurance significantly (P=0.214). The skin temperature improved significantly after heating, whereas decreased by cold pack (P<0.001).

Discussion

The results of the present study demonstrated a significant increase in elbow flexor muscles endurance after heating them Temperature is considered as an important determinant of muscles function. There are two theories which explain the effects of heating on muscles function. In the first view, it is assumed that increasing in muscles temperature lead to enhance muscles function due to more blood flow to the muscles. This theory has been developed based on the results of previous

studies demonstrating an improve in dynamic training capacity followed by active or passive muscle warm up. Contrary to this, the second theory explains the fact that doing exercises in a hot environment reduces dynamic training capacity due to general fatigue presumed as a result of core temperature increase [6-7].

The present study results are in accordance with the study done by Nodehi-Moghadam A et al.(2014) which suggest that application of applied a hot pack on wrist flexor muscles and the muscle endurance was improved probably due to enhanced blood flow to the muscles. The second theory was not checked in our study as we heated the muscles locally. Therefore we did not confront negative effects of general heating and its impact on core temperature the contractile velocity increased significantly in this temperature range [8].

Temperature is considered to be significant determinant of skeletal muscle function and performance. Muscle force generation and power output vary with changes in body temperature. An optimal temperature range at which the best performance of muscle isometric contraction occurs has been described. It has also been demonstrated that muscle contraction forces and rate of force development were impaired at low muscle temperatures and voluntary muscular force production capabilities were reported to be affected below 27^0C without core temperature change In fact, Rutkove showed that even a low degree of cooling decreased the rate of muscular force production [9].

The adductor pollicis muscle in man, when cooled from 38 to 28 deg C and stimulate with electrical stimulation also showed little effect of titanic strength by temperature. Below this temperature maximum strength was rapidly reduced. The same results were seen in the human quadriceps by Gerrits et al (2000) while half relaxation time was inversely related to muscle temperature [8]. A significant decrease in Maximal Voluntary Contraction (MVC) strength in the order of 10% was recorded in the TA after cooling; however, there was no change for the GM. Several studies have shown that cooling with water decreases isometric strength in superficial muscles. Holewijn and Heus also monitored a drop in maximal handgrip force after 30min local cooling at 15^0C. Comeau et al. evaluated the effects of environmental cooling on force production in the thigh muscles and registered a significant force drop in the quadriceps and hamstrings at temperatures 10 °C or below [9-11] as per study done by Mark W. Cornwall (1994) In both male and female subjects, the force-time curve shifts to the right following cold application but not with heat application [12].

Conclusion

The results of the present study demonstrated that grip capability is related to the muscles temperature. Increase in muscles temperature caused muscles endurance enhancement. However, applying cold on the muscles reduced their endurance.

References

1. De Ruiter CJ,Jones DA,Sargeant AJ, De Haan A. Temperature effect on the rates of isometric force development and relaxation in the fresh and fatigued human adductor pollicis muscle. Experimental Physiology. 1999; 84: 1137-1150.
2. Jerrold Petrofsky etal The Relationship between Muscle Temperature, MUAP Conduction Velocity and the Amplitude and Frequency Components of the Surface EMG During Isometric Contractions Basic Appl Myol. 2005; 15(2): 61-74.
3. Budoff, Je. The Prevalence of Rotator Cuff Weakness in Patients with Injured Hands. J Hand Surg. 2004 Nov; 29(6): 1154-9.
4. Fry, Ac, D Ciroslan, Md Fry, Cd Leroux, Bk Schilling, and Lz Chiu. Anthropometric and Performance Variables Discriminating Elite American Junior Men Weightlifters. Journal of Strength and Conditioning Research. 2006Nov; 20(4): 861-6.
5. Smith, T, S Smith, M Martin, R Henry, S Weeks, and Bryant. Grip Strength in Relation to Overall Strength and Functional Capacity in Very Old and Oldest Old Females. The Haworth Press Inc. 2006; pp 63-78.
6. Burke DG, MacNeil SA, Holt LE, MacKinnon NC, Rasmussen RL. The effect of hot or cold water immersion on isometric strength training. Journal of Strength and Conditioning Research. 2000; 14: 21-25.
7. Binhhorst R. A, Hoofd L, Vissers A. C. A.Temperature and force-velocity relationship of human muscles. Journal of Applied Physiology. 1977; 42: 471-475.
8. Afsun Nodehi Moghadam The effects of local heating and cooling of arm on maximal isometric force generated by the elbow flexor musculature in male subjects Iranian Rehabilitation Journal. April 2012; 10(15).
9. Amitava Halder etal Effects of Cooling on Ankle Muscle Strength, Electromyography, and Gait Ground Reaction Forces : Journal of Sports Medicine Volume 2014.
10. C. J. De Ruiter, D. A. Jones, A. J. Sargeant, and A. De Haan, "Temperature effect on the rates of isometric force development and relaxation in the freshand fatiguedhumanadductor pollicis muscle," Experimental Physiology. 1999; 84(6): pp. 1137–1150.

11. .C. T.M.Davies, I. K.Mecrow, and M. J.White, "Contractile properties of the human triceps surae with some observations on the effects of temperature and exercise," European Journal of Applied Physiology and Occupational Physiology. 1982; 49(2): 255–269.

12. Mark W. Cornwall Effect of Temperature on Muscle Force and Rate of Muscle Force Production in Men and Women JOSPT. August 1994; 20(2).

Original Article

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.5

Effect of Core Stabilization Program and Conventional Therapy in the Management of Patients with Recurrent Low Back Pain

Rawat Praveen*, Agarwal Vaibhav, Verma Shiv****

Abstract

The purpose of this study is to compare the effect of core stabilization program and conventional therapy in treating recurrent low back pain. Forty individuals were randomly assigned into two treatment groups of conventional therapy and core stabilization exercises. Treatment effects were established by pre-post treatment assessment of ROM,VAS and RMDQ. Both the group's variables are assessed for homogeneity by using one- way ANOVA prior to assessing for significance. The significance of the study is analyzed by using student t- test. This study demonstrated significantly higher improvements in VAS, RMDQ following core stabilization exercises and higher improvements in ROM following conventional exercise therapy at p=0.05. Thus this study concludes that the core stabilization exercises is more effective in improving VAS and RMDQ scores than the conventional exercise therapy recurrent low back pain patients.

Keywords: Core Stabilization Exercises; Low Back Pain.

Introduction

Recurrent low back pain is a cumulative process resulting from chronic poor posture coupled with sedentary habits that put back under severe stress.

Low back pain is associated with deconditioning of spine and trunk due to lack of core strength and stability in which 60-80% of general population suffer with high recurrence rates of 60–85% within following three year . Low backache is a discomfort in the area of the lower part of the back and spine.

Akuthota V et al [1,2,3], have explained that core strengthening has become a major trend in low back rehabilitation of the lumbar spine to maintain functional stability, promoted as a preventive regimen and performance-enhancing program as well.

Rainsville J et al [4,5,6], in a study reviewed regarding the efficacy of exercise in chronic low back pain, concluded that exercise is an integral tool to improve impairments in back flexibility and strength. It is effective in improving function, and decrease behavioral, cognitive, as well as disability aspects of low back pain syndrome.

Purpose

1. To study the Effect of conventional exercise
2. To study the Effect of core stabilization in patients with low back pain.
3. Compare of the effects of the two and analyze for any significant variation

There is significant difference in the effect of treatment between core stabilization program and conventional exercises in the management of recurrent low back pain with core stabilization program proving better than the conventional exercises.

Materials and Methods

Examination Table, Towels, Short wave Diathermy, Physio ball Goniometer The subjects were selected from the Outpatient Department of Physiotherapy of various hospitals in Dehradun.

Method of Data Collection

Total of 40 patients in two groups of 20 each

Author Affiliation: *Assistant Lecturer, **Lecturer, Department of Physiotherapy, Swami Rama Himalayan University, Dehradun.

Reprint Request: Vaibhav Agarwal, Lecturer, Department of Physiotherapy, Swami Rama Himalayan university, Swami Ram Nagar,P.O Doiwala Distt. Dehradun – 248140 Uttarakhand, India.
E-mail: vaibhavagarwalphysio@yahoo.in

selected randomly. Both male and female of age group 30-50 years with the diagnosis of recurrent low back ache

Group A: Control group 20 patients, Group B: Experimental group 20 patients.

Type of Study

Randomized Clinical Trial

Inclusion Criteria

- Both male and female patients.
- Age group between 30-50 years
- Postural predisposition

Exclusion Criteria

- Patients with tumor, infection or fracture.
- Patients with rheumatic and inflammatory conditions.
- Patients with disc disease. Lumbar strain or sprain.
- Lumbar canal stenosis.
- Bowel and bladder dysfunction
- Patients with any known pathological lesion in spine

Procedure

Selection of patient through detailed assessment of physical findings, inclusion and exclusion criteria. Short wave diathermy was given for 15 minutes prior to starting the exercises to relieve pain. The patients in the control group were treated with conventional back exercise program for 3 days a week for 6 weeks.

Group A

Group B

Short wave Diathermy was given for 15 minutes before the exercise session to relieve pain. Patients in experimental group were treated with core stabilization exercises for 30 minutes of 10 repetitions each with 10 seconds hold and adequate rest (10 seconds) was given between each repetition. The training session was scheduled for 3 days a week for 6 weeks.

The Exercises Given were as Follows

Exercise 1

Patient in supine lying on physio ball was instructed to place the hands behind the head and lift the trunk to reach the knees to hold the position for five seconds then bring it back to neutral position.

Exercise 2

Patient lying on his back with calves resting on the ball was asked to rock very slowly side-to-side with normal breathing.

Fig. 1: Treatment with short wave diathermy

Fig. 2: Rehabilitation with core rehabilitation exercises

Group B

Exercise 3

The patient in supine lying on the floor with feet on the ball and ankles together, arms behind the buttocks, using the thigh and abdominals asked to straighten the legs and hold it for 10 seconds then bring them back to neutral position After 6 weeks of training program, the patients were reassessed on the basis of pain rating on VAS and disability rating on the Rolland Morris Disability Questionnaire and ROM by using goniometer

Results

A group of 40 patients were randomly assigned

into two groups of 20 in each (n=20) into Control group (n=20), Experimental group (n=20), which were analyzed for their normality and homogeneity by using one-way anova.

This analysis has shown that all the groups were homogeneous and hence were analyzed for their significance by using student t- test. This analysis has shown significance in relation to decrease in pain, improving the functional outcome and disability at p=0.05 in core stabilization group when compared to control group

Table 1: t-value for improvement in VAS

n_1	n_2	Difference of Mean	Total SD	t-value	P value
20	20	1.25	0.305	4.098	0.05

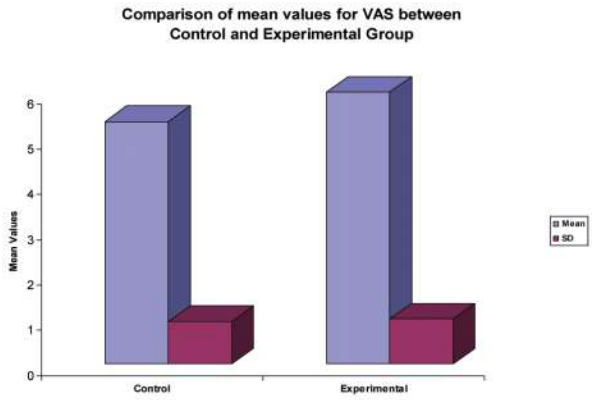

Table 2: t- value for improvements in Rolland Morris Disability Questionnaire

n_1	n_2	Difference of Mean	Total SD	t-value	P value
20	20	3.55	1.53	2.308	0.05

Discussion

The patients in group A showed improvements in VAS score with a mean of 5.35 and in Rolland Morris Disability Questionnaire with a mean of 10.55. These patients also shown improvements in flexion, extension, side flexion and rotation at p=0.05. The patients in Group B also showed improvements in VAS scores with a mean of 6.6 and morris disbality questionnaire of 14.1.Though conventional back care exercises and core stabilization exercises are proved to be effective in chronic recurrent low back pain patients, the group that received core stabilization exercises shown more strengthening the isolated muscles, where as in group B the concentration is on strengthening the group muscles. In case of Group A improvements in ROM is slightly higher than that of Group B.This is an accordance with mcgillls [6,7,8] that performing exercises on labile surface increase abdominal muscle activity, which changes both the level of muscle activity and the way the muscles co-activate to stabilize the spine and whole body. This suggests a much higher demand on motor control system, which may be desirable for rehabilitation programme.

Limitation

- The sample size in this study is small. The finding should be substantiated in a larger group of subjects.
- The follow-up to see the long-term effects of training is not done.
- The study has not taken into consideration of the patients other than the recurrent low back pain patients who constitute a fewer percentage of total back pain patients.
- The results of the study cannot be generalized to all unstable surfaces and all strength-training exercises.
- Improvements in strength of lumbar stabilizing muscles have not been documented.

Future Studies

- The study must be incorporated on a large population for more generalizations to be made.
- The study should be done on variety of low back pain patients.
- Further areas of research may include examining the intensity and duration of training.
- Core stabilization exercises using different labile surfaces is recommended. Future studies implementing strength outcome are advised.

Conclusion

Supporting evidence from the literature though seems to be controversial in certain areas, the outcome of this study with highly significant statistical changes will lead us to the conclusion of accepting the research hypothesis which could be stated as "Core stabilization exercises is more effective in the management of recurrent low back pain than conventional therapy".

References

1. Brain J, Shilpi DO: The Physician and Sports Medicine. Aug. 1997; 25(8).

2. "Low back pain", The Merck manual; 17th edition 1999.
3. Troup JDG. Low back pain; Spine. 1987; 12.
4. Jeffrey D Booyling, Nigel Palstanga: Grieves Modern Manual Therapy, 2nd edn, p309.
5. James A. Porterfield: Mechanical low back pain. 2nd edition; page 1&4.
6. McGill SM 1998. Low back exercises: prescription for the healthy back and when recovering from injury. In: Resources Manual for Guidelines for Exercise Testing and Prescription. 3rd ed. Indianapolis, Ind: American College of Sports Medicine. Baltimore, Williams and Wilkins.
7. Foster, DM & Fulton, MN: Back pain &exercise program, clinics in sports medicine. 1991; 10: 187.
8. Gramse R, Sinaki M, Ilstrup D. Lumbar spondylolisthesis: A rational approach to_Conservative treatment. Mayo, Clin Proc. 1980; 55: 681-6.
9. Saal JA, The new back school prescription; stabilization training, part II, spine state art rev. 1997; 5: 357-65.
10. McGill S. The mechanics of torso flexion: situps and standing dynamic flexion maneuvers. Clin Biomech. 1995; 10: 184-19.
11. George A. Koumantakis et al: Trunk muscle stabilization training plus general exercises vs general exercises only. Randomised control trial of patients with recurrent LBP, Physical therapy. March 2005; 85(3).
12. Marshall PW, Murphy BA. Core stability exercises on and off a Swiss ball. Arch Phys Med Rehabil. Feb 2005; 86(2): 242-9.
13. Akuthota V, Nadler SF: Core strengthening, Arch Phys Med Rehabil. Mar 2004; 85(3 Suppl 1): S86-92.
14. Shaughnessy, M. 1: Caulfield, B. A pilot study to investigate the effect of lumbar stabilization exercise training on functional ability and quality of life in patients with chronic low back pain. International Journal of Rehabilitation Research. December 2004; 27(4): 297-301.
15. Maher CG: Effective physical treatment for chronic low back pain, Spine J. Jan 2004; 4(1): 106-15.
16. Rainsville Jet al: Exercise as a treatment for chronic lowback pain. Spine J. Jan 2004; 4(1): 106-15
17. Panjabi MM: Clinical spinal instability and low back pain, J Electromyogr Kinesiol.
18. Cosio-Lima LM etal: Effects of physioball and conventional floor exercises on early phase adaptations in back and abdominal core stability and balance in women. J Strength Cond Res. Nov 2003; 17(4): 721-5.
19. Van Dieen JH, Cholewicki J, Radebold: A. Trunk muscle recruitment patterns in patients with low back pain enhance the stability of the lumbar spine. Spine. Apr 2003; 15; 28(8): 834-41.
20. Yilmaz F, Yilmaz A: Efficacy of dynamic lumbar stabilization exercise in lumbarmicrodiscectomy, J Rehabil Med. Jul 2003; 35(4): 163-7.

Review Article

Physiotherapy and Occupational Therapy Journal
Volume 9 Number 1, January - March 2016
DOI: http://dx.doi.org/10.21088/potj.0974.5777.9116.6

Physiotherapy/Physical Therapy Journals: Earthing or Unearthing of Scientific Evidence

Nisha Rani Jamwal*, Senthil P. Kumar, Asir John Samuel*****

Abstract

The aim of this review paper was to highlight the role played by physiotherapy/ physical therapy (PT) journals through a preliminary search of PubMed to summarize the studies on analysis of reporting among PT journals. There were two studies on trial registration policies of journals, and seven studies performed content analysis of published articles: two for study design (randomized controlled trials, controlled clinical trials), three for types of published articles, one for core literature, one for gerontology and one for bibliometrics. There is a dearth need to produce more such reports of PT journals and their performance trend along disease-specific, treatment-specific, outcome-specific, population-specific and evidence-specific constructs in the future.

Keywords: Evidence-Informed Physical Therapy; Scientific Contribution; Publishing Policies; Critical Appraisal.

Introduction

Physiotherapy/Physical therapy (PT) is well recognized as an independent clinical profession with growing professional autonomy [1] that had paved its way to professionalism [2] and professionalization [3] in all fields of medicine, for evaluation and management of all health and disease [4] conditions for people of all ages [5]. PT journals play a comprehensive role in scientific evolution of research in an era of evidence-informed physical therapy [5]. The aim of this review paper was to highlight the role played by physiotherapy/ physical therapy (PT) journals through a preliminary search of PubMed to summarize the studies on analysis of reporting among PT journals.

Editorial Policies-Trial Registration

Costa et al [6] published the recommendations from the International Society of Physiotherapy Journal Editors (ICMJE) for clinical trial registration in physiotherapy journals with prospective trial registration being advantageous for avoiding unnecessary trial duplication and to facilitate public dissemination by reducing selective reporting and publication bias.

Babu et al [7] reviewed the 13 MEDLINE-indexed English-language physical therapy journals (Journal of Geriatric Physical Therapy, Journal of Hand Therapy, Journal of Neurologic Physical Therapy, Journal of Orthopaedic and Sports Physical Therapy, Journal of Physiotherapy [formerly Australian Journal of Physiotherapy], Journal of Science and Medicine in Sport, Manual Therapy, Physical Therapy, Physical Therapy in Sport, Physiotherapy, Physiotherapy Research International, Physiotherapy Theory and Practice, and Revista Brasileira de Fisioterapia) for their editorial policies regarding trial registration. Of the 13 journals, 8 recommended trial registration, and 6 emphasized prospective trial registration. 9% of the articles were clinical trials and 29% reported trial registration details, with a positive trend in reporting of trial registration observed from 2008 to 2012.

Content Analysis- Randomized Controlled Trials

Costa et al [8] reviewed to identify five core journals in physical therapy (Archives of Physical Medicine

Author Affiliation: *Freelancer and consultant Physiotherapist, Udhampur, Jammu & Kashmir, India. **Professor ***Asst Professor, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana (Ambala), Haryana, India.

Reprint Request: Senthil P. Kumar, Professor and Principal, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana-Ambala-133207, Haryana, India.
E-mail: senthilparamasivamkumar@gmail.com

and Rehabilitation, Clinical Rehabilitation, Spine, British Medical Journal (BMJ), and Chest)by identifying those that publish at least 80 randomized controlled trials of physical therapy interventions, provide the highest-quality reports of randomized controlled trials, and have the highest journal impact factors. Their study had mixed findings that suggested that high-quality trials are not necessarily published in journals with high impact factors because there were no significant relationships among the rankings on the basis of trial quality, number of trials, or journal impact factor.

Content Analysis- Controlled Clinical Trials

Turrillaset al [9] reviewed 10 Spanish physiotherapy journals for describing 78 controlled clinical trials (CCT) into as follows; "Many of them were multicentric, and Traumatology and orthopaedics was the most studied field followed by neurology. The most reported health problems were back pain, fibromyalgia, arthrosis and stroke, and the outcomes reported included pain control, functional mobility and quality of life."

Content Analysis: Types of Published Articles

Miller et al [10] evaluated 179 articles in 6 consecutive issues of the Australian Journal of Physiotherapy (AJP), Physical Therapy (PTJ), Physiotherapy (P), and Physiotherapy Canada (PC) between 2000 and June 2001 to identify the type and purpose of each article and assessed the rigor of treatment and review articles. Majority of articles were original studies, on human healthcare, and on indirectly related topics on measurement properties or on asymptomatic subjects. PTJ had the highest pass rate followed by AJP, P and PC.

Paciet al [11] evaluated 1627 articles in nine physiotherapy journalsto quantify the types of research and review articles and found 205 (12.60%) were randomized controlled trial (RCT). Observational studies were most common as validation studies and meta-analyses were least. High heterogeneity was found in terms of distribution over years and journals had an improvement of the number of RCTs among years.

Saragiottoet al [12] evaluated the 7-year bibliometric data, research design, research type (human or animal), and clinical area for 1458 articles published in four Brazilian physical therapy journals (Revista Brasileira de Fisioterapia, Revista Fisioterapiaem Movimento, RevistaFisioterapia e Pesquisa, and RevistaActaFisiátrica). Level-2 evidence was most common, followed by levels 3 and 1. Commonly, cross-sectional studies (38%), single-case or case-series studies, and narrative reviews were found, and mostly human studies on musculoskeletal, neurologic, and cardiothoracic conditions were found.

Content Analysis- Core Literature

Fell et al [13] analysed four databases to identify core journals in the literature of physical therapy, references cited in that literature, and the highest coverage rate of core journals. Their study findings were as follows; "journal articles were the most frequently cited type of literature, with sixteen journals supplying one-third of the cited journal references. Physical Therapy was the most commonly cited title. There were more cited articles published from 2000 to 2007 than in any previous full decade. Of the databases analyzed, CINAHL provided the highest coverage rate for Zone 1 2007 publications."

Content Analysis- Gerontology

Jones and Minichiello [14] analysed 144 articles in the field of gerontology/geriatrics published between 1980-88 in leading physiotherapy journals in America, Australia, Canada, New Zealand and the United Kingdom for source of publication and authors, research design and possible professional practice implications. The study found under-representation of gerontology in physiotherapy journals with a publishing trend towards data-based articles; with less interdisciplinary articles and limited inter-institutional collaboration.

Content Analysis- Bibliometrics

Teixeira et al [15] evaluated the frequency of citations of 13,009 references in 456 locally published papers in references of three Brazilian physical therapy journals (Fisioterapiaem Movimento, Fisioterapia e Pesquisa and Revista Brasileira de Fisioterapia). Nearly 22% of cited works were local articles and 7.89% articles did not cite national articles and 13.25% articles cited more national articles than international articles.

Discussion and Conclusion

There were two studies on trial registration policies of journals, and seven studies performed content analysis of published articles: two for study design (randomized controlled trials, controlled clinical

trials), three for types of published articles, one for core literature, one for gerontology and one for bibliometrics.

Previously published reviews on disease-specific (cancer pain [16], cancer-related fatigue [17] HIV/AIDS [18]), treatment-specific (death/bereavement care [19]), population-specific (pediatric [20]), outcome-specific(quality of life [21], attitudes [22], knowledge/awareness [23]) and evidence-specific (validation studies [24], randomized controlled trials [25], systematic reviews/meta-analyses [26]) constructs were on palliative care journals. Earthing of evidence implied the strong scientific foundation available for informed decision-making (provided by systematic reviews and meta-analysis) whereas unearthing implied the development of innovative research (through preliminary, laboratory and pilot studies). Both earthing and unearthing of scientific evidence is an essential recipe for evidence-informed PT [27] as was recommended in a similar review by Kumar et al which found three studies on PT journals [28].

In an era of exponential growth of volumes of evidence for PT [29], there is a dearth need to produce more such reports of PT journals and their performance trend along disease-specific, treatment-specific, outcome-specific, population-specific and evidence-specific constructs in the future through rigorous content analysis methodologies.

Acknowledgments: None

Conflicts of Interest

None identified and/or declared.

References

1. Kumar SP. (R)Evolution of professional autonomy in physical therapy practice- a century-long walk through Pubmed from 1910-2010. J PhysTher. 2010; 2: 1-10.
2. Kumar SP, Sisodia V, Jacob E. Levels of Professionalism amongPhysical Therapists in India-A National Cross-Sectional Survey. J Sports Med Doping Stud. 2013; 3: 123.
3. Kumar SP. Physical Therapy- A Review on Realization of the Need vs. Need for Realization. Physiotimes. 2011; 2(6): 12-5.
4. Kumar SP. Physical therapy: past, present and future-a paradigm shift. J PhysTher. 2010; 1(2): 58-67.
5. Kumar SP, Jim A. Physical therapy in palliative care: from symptom control to quality of life- a critical review. Indian J Palliat Care. 2010; 16(3): 138-46.
6. Costa LO, Lin CW, Grossi DB, Mancini MC, Swisher AK, Cook CE, Vaughn DW, Elkins MR, Sheikh U, Moore A, Jull GA, Craik RL, Maher CG, Guirro RR, Marques AP, Harms M, Brooks D, Simoneau GG, Strupstad JH.Clinical trial registration in physiotherapy journals: recommendations from the International Society of Physiotherapy Journal Editors.J Orthop Sports PhysTher. 2012; 42(12): 978-81.
7. Babu AS, Veluswamy SK, Rao PT, Maiya AG.Clinical trial registration in physical therapy journals: a cross-sectional study.PhysTher. 2014; 94(1): 83-90.
8. Costa LO, Moseley AM, Sherrington C, Maher CG, Herbert RD, Elkins MR.Core journals that publish clinical trials of physical therapy interventions. PhysTher. 2010; 90(11): 1631-40.
9. Turrillas M, Sitjà-Rabert M, Pardo H, VilaróCasamitjana J, Fort-Vanmeerhaeghe A, MorralFernández A, Cebrià I Iranzo MÀ, BonfillCosp X.Identification and description of controlled clinical trials published in Physiotherapy journals in Spain.J EvalClinPract. 2015 Sep 14.doi: 10.1111/jep.12441.
10. Miller PA, McKibbon KA, Haynes RB.A quantitative analysis of research publications in physical therapy journals.PhysTher. 2003; 83(2): 123-31.
11. Paci M, Cigna C, Baccini M, Rinaldi LA.Types of article published in physiotherapy journals: a quantitative analysis.PhysiotherRes Int. 2009; 14(4): 203-12.
12. Saragiotto BT, Costa LC, Oliveira RF, Lopes AD, Moseley AM, Costa LO.Description of research design of articles published in four Brazilian physical therapy journals.Braz J PhysTher. 2014; 18(1): 56-62.
13. Fell DW, Burnham JF, Buchanan MJ, Horchen HA, Scherr JA.Mapping the core journals of the physical therapy literature.J Med Libr Assoc. 2011; 99(3): 202-7.
14. Jones D, Minichiello V.A survey of gerontology articles in physiotherapy journals.Aust J Physiother. 1991; 37(3): 155-61.
15. Teixeira RK, Yamaki VN, Botelho NM, Teixeira RC.Citations of Brazilian physical therapy journals in national publications.Braz J PhysTher. 2014; 18 (1): 88-92.
16. Kumar SP. Reporting characteristics of cancer pain: a systematic review and quantitative analysis of research publications in palliative care journals. Indian J Palliat Care. 2011; 17(1): 57-66.
17. Kumar SP, Prasad K. Reporting of 'cancer-related fatigue': a systematic review and quantitative analysis of research publications in palliative care journals. Ibnosina Journal of Medicine and Biomedical Sciences. 2013; 5(1): 22-30.
18. Kumar SP, Sisodia V, Ramapuram J. Reporting of HIV/AIDS: A systematic review and quantitative

analysis of research publications in palliative care journals. Int J Health Rehabil Sci. 2013; 2(1): 56-65.

19. Kumar SP, Sisodia V. Reporting of 'death and bereavement care': a systematic review and quantitative analysis of research publications in palliative care journals. International Journal of Health and Allied Sciences. 2013; 2(3): 176-84.
20. Kumar SP. Reporting of pediatric palliative care: a systematic review and quantitative analysis of research publications in palliative care journals. Indian J Palliat Care 2011; 17(3): 202-9.
21. Kumar SP. Reporting of quality of life: a systematic review and quantitative analysis of research publications in palliative care journals. Indian J Palliat Care. 2012; 18(1): 59-67.
22. Kumar SP, Sisodia V. Reporting of 'attitudes': a systematic review and quantitative analysis of research publications in palliative care journals. Asian J Med Res. 2012; 1(4): 152-8.
23. Jamwal NR, Kumar SP. Reporting of Knowledge and Awareness- A Systematic Review and Quantitative Analysis of Research Publications in Palliative Care Journals. Indian J Med Health Sci 2016; 3(1): 13-22.
24. Kumar SP, Sisodia V. Reporting of 'validation studies': a systematic review and quantitative analysis of research publications in palliative care journals. Saudi Journal for Health Sciences. 2013; 2(3): 161-8.
25. Kumar SP, Sisodia V. Reporting of randomized clinical trials- a systematic review of qualitative and quantitative analysis of research publications in palliative care journals. Saudi J Health Sci. 2013; 2(2): 93-102.
26. Kumar SP. Reporting of systematic reviews and meta-analyses: a bibliometric analysis of research publications in palliative care journals. International Journal of Biomedical and Advanced Research. 2012; 3(6): 502-10.
27. Kumar SP. Establishing evidence from practice: Can status of current practice inform future decision-making? Use and misuse of practice-based evidence in Physical therapy. J PhysTher. 2012; 4(2): 45-9.
28. Kumar SP, Kumar VK, Vaishali K. Physiotherapy/ Physical Therapy Journals: Struggling to exist or Getting fit to Survive? PhysiotherOccupTher J. 2013; 6(2): 97-8.
29. Kumar SP, Sisodia V, Kumar A. Evidence for Physiotherapy/Physical Therapy: a 40-year Trend Analysis and Explorative Synthesis of Articles. Saudi Journal for Health Sciences. 2013; 2(1): 22-30.

Guidelines for Authors

Manuscripts must be prepared in accordance with "Uniform requirements for Manuscripts submitted to Biomedical Journal" developed by international committee of medical Journal Editors.

Types of Manuscripts and Limits

Original articles: Up to 3000 words excluding references and abstract and up to 10 references.

Review articles: Up to 2500 words excluding references and abstract and up to 10 references.

Case reports: Up to 1000 words excluding references and abstract and up to 10 references.

Online Submission of the Manuscripts

Articles can also be submitted online from http://rfppl.co.in/customer_index.php.

I) First Page File: Prepare the title page, covering letter, acknowledgement, etc. using a word processor program. All information which can reveal your identity should be here. use text/rtf/doc/PDF files. Do not zip the files.

2) Article file: The main text of the article, beginning from Abstract till References (including tables) should be in this file. Do not include any information (such as acknowledgement, your name in page headers, etc.) in this file. Use text/rtf/doc/PDF files. Do not zip the files. Limit the file size to 400 Kb. Do not incorporate images in the file. If file size is large, graphs can be submitted as images separately without incorporating them in the article file to reduce the size of the file.

3) Images: Submit good quality color images. Each image should be less than 100 Kb in size. Size of the image can be reduced by decreasing the actual height and width of the images (keep up to 400 pixels or 3 inches). All image formats (jpeg, tiff, gif, bmp, png, eps etc.) are acceptable; jpeg is most suitable.

Legends: Legends for the figures/images should be included at the end of the article file.

If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks from submission. Hard copies of the images (3 sets), for articles submitted online, should be sent to the journal office at the time of submission of a revised manuscript. Editorial office: **Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi – 110 091, India, Phone: 91-11-22754205, 45796900, Fax: 91-11-22754205, E-mail: author.rfp@rfppl.co.in. Website: www.rfppl.co.in**

Preparation of the Manuscript

The text of observational and experimental articles should be divided into sections with the headings: Introduction, Methods, Results, Discussion, References, Tables, Figures, Figure legends, and Acknowledgment. Do not make subheadings in these sections.

Title Page

The title page should carry

1) Type of manuscript (e.g. Original article, Review article, Case Report)
2) The title of the article, should be concise and informative;
3) Running title or short title not more than 50 characters;
4) The name by which each contributor is known (Last name, First name and initials of middle name), with his or her highest academic degree(s) and institutional affiliation;
5) The name of the department(s) and institution(s) to which the work should be attributed;
6) The name, address, phone numbers, facsimile numbers and e-mail address of the contributor responsible for correspondence about the manuscript; should be mentoined.
7) The total number of pages, total number of photographs and word counts separately for abstract and for the text (excluding the references and abstract);
8) Source(s) of support in the form of grants, equipment, drugs, or all of these;
9) Acknowledgement, if any; and
l0) If the manuscript was presented as part at a meeting, the organization, place, and exact date on which it was read.

Abstract Page

The second page should carry the full title of the manuscript and an abstract (of no more than 150 words for case reports, brief reports and 250 words for original articles). The abstract should be structured and state the Context (Background), Aims, Settings and Design, Methods and Materials, Statistical analysis used, Results and Conclusions. Below the abstract should provide 3 to 10 keywords.

Introduction

State the background of the study and purpose of the study and summarize the rationale for the study or observation.

Methods

The methods section should include only information that was available at the time the plan or protocol for the study was written such as study approach, design, type of sample, sample size, sampling technique, setting of the study, description of data collection tools and methods; all information obtained during the conduct of the study belongs in the Results section.

Reports of randomized clinical trials should be based on the CONSORT Statement (http://www.consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma.net/e/policy/l 7-c_e.html).

Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

Discussion

Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

References

List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347-55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O, Kidd EAM,

editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

More information about other reference types is available at www.nlm.nih.gov/bsd/uniform_requirements.html, but observes some minor deviations (no full stop after journal title, no issue or date after volume, etc).

Tables

Tables should be self-explanatory and should not duplicate textual material.

Tables with more than 10 columns and 25 rows are not acceptable.

Table numbers should be in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Explain in footnotes all non-standard abbreviations that are used in each table.

For footnotes use the following symbols, in this sequence: *, ¶, †, ‡‡,

Illustrations (Figures)

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files of minimum 1200x1600 pixel size. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the figure instead of to the side.

Original color figures can be printed in color at the editor's and publisher's discretion provided the author agrees to pay.

Type or print out legends (maximum 40 words, excluding the credit line) for illustrations using double spacing, with Arabic numerals corresponding to the illustrations.

Sending a revised manuscript

While submitting a revised manuscript, contributors are requested to include, along with single copy of the final revised manuscript, a photocopy of the revised manuscript with the changes underlined in red and copy of the comments with the point to point clarification to each comment. The manuscript number should be written on each of these documents. If the manuscript is submitted online, the contributors' form and copyright transfer form has to be submitted in original with the signatures of all the contributors within two weeks of submission. Hard copies of images should be sent to the office of the journal. There is no need to send printed manuscript for articles submitted online.

Reprints

Journal provides no free printed reprints, however a author copy is sent to the main author and additional copies are available on payment (ask to the journal office).

Copyrights

The whole of the literary matter in the journal is copyright and cannot be reproduced without the written permission.

Declaration

A declaration should be submitted stating that the manuscript represents valid work and that neither this manuscript nor one with substantially similar content under the present authorship has been published or is being considered for publication elsewhere and the authorship of this article will not be contested by any one whose name (s) is/are not listed here, and that the order of authorship as placed in the manuscript is final and accepted by the co-authors. Declarations should be signed by all the authors in the order in which they are mentioned in the original manuscript. Matters appearing in the Journal are covered by copyright but no objection will be made to their reproduction provided permission is obtained from the Editor prior to publication and due acknowledgment of the source is made.

Abbreviations

Standard abbreviations should be used and be spelt out when first used in the text. Abbreviations should not be used in the title or abstract.

Checklist

- Manuscript Title
- Covering letter: Signed by all contributors
- Previous publication/ presentations mentioned, Source of funding mentioned
- Conflicts of interest disclosed

Authors

- Middle name initials provided.
- Author for correspondence, with e-mail address provided.
- Number of contributors restricted as per the instructions.
- Identity not revealed in paper except title page (e.g.name of the institute in Methods, citing previous study as 'our study')

Presentation and Format

- Double spacing
- Margins 2.5 cm from all four sides
- Title page contains all the desired information. Running title provided (not more than 50 characters)
- Abstract page contains the full title of the manuscript
- Abstract provided: Structured abstract provided for an original article.
- Key words provided (three or more)
- Introduction of 75-100 words
- Headings in title case (not ALL CAPITALS). References cited in square brackets
- References according to the journal's instructions

Language and grammar

- Uniformly American English
- Abbreviations spelt out in full for the first time. Numerals from 1 to l0 spelt out
- Numerals at the beginning of the sentence spelt out

Tables and figures

- No repetition of data in tables and graphs and in text.
- Actual numbers from which graphs drawn, provided.
- Figures necessary and of good quality (color)
- Table and figure numbers in Arabic letters (not Roman).
- Labels pasted on back of the photographs (no names written)
- Figure legends provided (not more than 40 words)
- Patients' privacy maintained, (if not permission taken)
- Credit note for borrowed figures/tables provided
- Manuscript provided on a CDROM (with double spacing)

Submitting the Manuscript

- Is the journal editor's contact information current?
- Is the cover letter included with the manuscript? Does the letter:

1. Include the author's postal address, e-mail address, telephone number, and fax number for future correspondence?
2. State that the manuscript is original, not previously published, and not under concurrent consideration elsewhere?
3. Inform the journal editor of the existence of any similar published manuscripts written by the author?
4. Mention any supplemental material you are submitting for the online version of your article. Contributors' Form (to be modified as applicable and one signed copy attached with the manuscript)

Revised Rates for 2016 (Institutional)

Title	Frequency	Rate (Rs): India	Rate ($):ROW
Dermatology International	2	5000	500
Gastroenterology International	2	5500	550
Indian Journal of Agriculture Business	2	5000	500
Indian Journal of Anatomy	3	8000	800
Indian Journal of Ancient Medicine and Yoga	4	7500	750
Indian Journal of Anesthesia and Analgesia	3	7000	700
Indian Journal of Anthropology	2	12000	1200
Indian Journal of Biology	2	4000	400
Indian Journal of Cancer Education and Research	2	8500	850
Indian Journal of Communicable Diseases	2	8000	800
Indian Journal of Dental Education	4	4500	450
Indian Journal of Forensic Medicine and Pathology	4	15500	1550
Indian Journal of Forensic Odontology	2	4500	450
Indian Journal of Genetics and Molecular Research	2	6500	650
Indian Journal of Law and Human Behavior	2	5500	550
Indian Journal of Library and Information Science	3	9000	900
Indian Journal of Maternal-Fetal & Neonatal Medicine	2	9000	900
Indian Journal of Medical & Health Sciences	2	6500	650
Indian Journal of Obstetrics and Gynecology	3	7000	700
Indian Journal of Pathology: Research and Practice	3	11500	1150
Indian Journal of Plant and Soil	2	5500	550
Indian Journal of Preventive Medicine	2	6500	650
International Journal of Food, Nutrition & Dietetics	3	5000	500
International Journal of History	2	6500	650
International Journal of Neurology and Neurosurgery	2	10000	1000
International Journal of Political Science	2	5500	550
International Journal of Practical Nursing	3	5000	500
International Physiology	2	7000	700
Journal of Animal Feed Science and Technology	2	4100	410
Journal of Cardiovascular Medicine and Surgery	2	9100	910
Journal of Forensic Chemistry and Toxicology	2	9000	900
Journal of Microbiology and Related Research	2	8000	800
Journal of Orthopaedic Education	2	5000	500
Journal of Pharmaceutical and Medicinal Chemistry	2	16000	1600
Journal of Practical Biochemistry and Biophysics	2	5500	550
Journal of Social Welfare and Management	3	7500	750
New Indian Journal of Surgery	3	7100	710
Ophthalmology and Allied Sciences	2	5500	550
Otolaryngology International	2	5000	500
Pediatric Education and Research	3	7000	700
Physiotherapy and Occupational Therapy Journal	4	8500	850
Urology, Nephrology and Andrology International	2	7000	700
SUPER SPECIALITY JOURNALS			
Indian Journal of Emergency Medicine	2	12000	1200
Indian Journal of Surgical Nursing	3	5000	500
Indian Journal of Trauma & Emergency Pediatrics	3	9000	900
International Journal of Pediatric Nursing	3	5000	500
Journal of Community and Public Health Nurisng	2	5000	500
Journal of Geriatric Nursing	2	5000	500
Journal of Medical Images and Case Reports	2	5000	500
Journal of Nurse Midwifery and Maternal Health	3	5000	500
Journal of Organ Transplantation	2	25900	2590
Journal of Psychiatric Nursing	3	5000	500
Psychiatry and Mental Health	2	7500	750

Terms of Supply:
1. Advance payment required by Demand Draft payable to Red Flower Publicaion Pvt. Ltd. payable at Delhi.
2. Cancellation not allowed except for duplicate payment.
3. Agents allowed 10% discount.
4. Claim must be made within six months from issue date.

Order from
Red Flower Publication Pvt. Ltd., 48/41-42, DSIDC, Pocket-II, Mayur Vihar Phase-I, Delhi - 110 091 (India), Tel: 91-11-22754205, 45796900, Fax: 91-11-22754205. E-mail: customer.rfp@rfppl.co.in, redflowerppl@gmail.com, Website: www.rfppl.co.in