



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

MGM SCHOOL OF PHYSIOTHERAPY

Sector-1, Kamothe, Navi Mumbai – 410209

APPLICATION FOR SEED MONEY/RESEARCH GRANT

Date : 16th December 2021

Name of Principal Investigator : Miss. Devika Bhosale

Name of co-investigator/s : Dr Bela Agarwal

Title of the project : Exploring effects of Pranayama on lung functions in Chronic respiratory condition- A Systematic Review and Meta-Analysis (MGM/DCH/IEC/63/2021)

Name of Department : MGM Centre of Human Movement Science, MGM School of Physiotherapy

Name of the Institution : MGM Institute of Health Sciences, NM

Designation : Professor

E-mail address : bagarwal@mgmsopnm.edu.in

Mobile : 9819000674

List of important publications of last 5 years of the all the investigators in the relevant fields

1. Mullerpatan R, Agarwal BM. Early detection and therapeutic intervention to maximize functioning in children and adults with non-communicable diseases associated with disability: challenges & solutions. Critical Reviews™ in Physical and Rehabilitation Medicine.
2. **Agarwal B**, Shah M, Sawant B, Bagwe H, Murkudkar P, Mullerpatan R. Predictive equation for six-minute walk test in Indian children, adolescents, and adults. Lung India. 2023 Mar 1;40(2):143-8.
3. Mullerpatan R, **Agarwal BM**, Joshi A, Nayak A, Kulkarni S. Health-Related Quality of Life of People with Chronic Kidney Disease in Low-and Middle-Income Countries: A Literature Review. Critical Reviews™ in Physical and Rehabilitation Medicine. 2023;35.
4. Kuttan V, Shetty T, Parab S, Agarwal B, Mullerpatan R. Evidence-base for effect of team sports on physical, psychological, and social function in children with neuro-motor impairment: A narrative review. Critical Reviews™ in Physical and Rehabilitation Medicine.2023



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5. **Agarwal B**, Parab SD, Amberkar O, Mullerpatan R. Effect of 12-week sports intervention programme on physical fitness and sports performance in individuals with spinal cord injury. *Indian Journal of Physiology and Pharmacology*. 2023 Jan;67(1):50.
6. Bhosale DA, **Agarwal B**, Murkudkar P, Bagwe H. Incentive Spirometer to Improve Lung Function in Patients with Chronic Lung Disease: A Patient Guide. *Archives of Physical Medicine and Rehabilitation*. 2023 Apr 13.
7. Murkudkar P, **Agarwal BM**, Mullerpatan R. Factors Influencing Health-Related Quality of Life, Return to Work, and Optimal Utilization of Cardiac Rehabilitation in Adults with Cardiac Disorders– A Literature Review. *Critical Reviews™ in Physical and Rehabilitation Medicine*. 2023;35(2).
8. **Bela Agarwal**, Nikita Jagtap, Hiranmayee Bagwe, Payal Murkudkar. Awake repositioning/proning protocol: A Guide for ICU patients and caregivers. *Archives of Physical Medicine and Rehabilitation*. Accepted for publication(2022)
9. Bagwe H, **Agarwal BM**, Mullerpatan R. Evaluation and Physiotherapy Management of Diaphragm Dysfunction in Patients Admitted to the Medical Critical Care Unit: A Review of the Literature. *Critical Reviews™ in Physical and Rehabilitation Medicine*. 2022;34(4).
10. Mullerpatan R, Waingankar P, Parab S, **Agarwal B**, Nagrale O, Dalvi S. Pilot implementation of rural rehabilitation services, India. *Bulletin of the World Health Organization*. 2022 Nov 1;100(11):662-8.
11. Kanojia AK, Bagwe HS, **Agarwal BM**. A review of the physiological effects of Suryanamaskar in children. *MGM Journal of Medical Sciences*. 2022 Jul 1;9(3):410-8.
12. Patel G, Mullerpatan R, **Agarwal B**, Shetty T, Ojha R, Shaikh-Mohammed J, Sujatha S. Validation of wearable inertial sensor-based gait analysis system for measurement of spatiotemporal parameters and lower extremity joint kinematics in sagittal plane. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*. 2022 Jan 8:09544119211072971
13. Aglawe DR, **Agarwal BM**, Sawant BD. Physical Function in Critically Ill Patients during the Duration of ICU and Hospital Admission. *Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine*. 2022 Mar;26(3):314.



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14. **Agarwal BM**, Aglawe D, Sawant B. Physical function assessment tools in the intensive care unit: a narrative review. *Critical Reviews™ in Physical and Rehabilitation Medicine*. 2022;34(1).
15. **Agarwal BM**, Yadav RP, Tambe SD, Kulkarni CC, Mullerpatan RP. Evaluation of Early Knee Osteoarthritis Using Biomechanical and Biochemical Markers. *Critical Reviews™ in Biomedical Engineering*. 2021;49(6).
16. Vaidya SS, **Agarwal B**, Singh Y, Mullerpatan R. Effect of Yoga on Performance and Physical Fitness in Cricket Bowlers. *International Journal of Yoga Therapy*. 2021 Sep 22.
17. Mullerpatan R, Shetty T, Singh Y, **Agarwal B**. Lower extremity joint loading during Bounce rope skip in comparison to run and walk. *Journal of Bodywork and Movement Therapies*. 2021 Apr 1;26:1-6.
18. **Agarwal BM**, van Deursen R, Mullerpatan RP. Electromyographic evaluation of spine and lower extremity muscles during repeated and sustained bodyweight deep-squat. *Trends in Sport Sciences*, 2021, 28(1): 19-27.
19. Swaminathan N, Jiandani M, Surendran PJ, Jacob P, Bhise A, Baxi G, Devani P, **Agarwal B**, Kumar VS, Pinto NM, Damke U. Beyond COVID-19: Evidence-Based Consensus Statement on the Role of Physiotherapy in Pulmonary Rehabilitation in the Indian Context. *The Journal of the Association of Physicians of India*. 2020 Dec 1;68(12):82-89.
20. Jiandani MP, **Agarwal B**, Baxi G, Kale S, Pol T, Bhise A, Pandit U, Shetye JV, Diwate A, Damke U, Ravindra S. Evidence-based National Consensus: Recommendations for Physiotherapy Management in COVID-19 in Acute Care Indian Setup. *Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine*. 2020 Oct;24(10):905-913.
21. Mohanty T, Mehta D, Mullerpatan R, **Agarwal B**. Cardiorespiratory Endurance, Flexibility and Lower-Extremity Muscle Strength in Children and Adolescents with Cerebral Palsy. *Critical Reviews™ in Physical and Rehabilitation Medicine*. 2020;32(2):75-83.
22. Mullerpatan RP, **Agarwal BM**, Shetty TV. Exploration of muscle activity using surface electromyography while performing surya namaskar. *International Journal of Yoga*. 2020 May;13(2):137-143.



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23. Mullerpatan RP, **Agarwal BM**, Shetty T, Nehete GR, Narasipura OS. Kinematics of suryanamaskar using three-dimensional motion capture. International journal of yoga. 2019 May;12(2):124.
24. Mullerpatan R, Sonkhia M, Thomas B, Mishra S, Gupta A, **Agarwal B**. Review of Contextual Factors Influencing Function Following Lower Extremity Amputation in Low to Middle Income Countries. Crit Rev Phys Rehabil Med. 2019;31(2):173-183.
25. **Agarwal B**, Advani M, van Deursen R, Mullerpatan R. Influence of varying squat exposure on knee pain and function among people with knee osteoarthritis. Critical Reviews™ in Physical and Rehabilitation Medicine. 2019;31(1):11-22.
26. Nair S, **Agarwal B**, Chatla J, Mullerpatan R. Health-related physical fitness of people with type 2 diabetes mellitus. Critical Reviews™ in Physical and Rehabilitation Medicine. 2019;31(1):23-33.
27. Naryanan G, Bose M, Parab S, **Agarwal B**, Mullerpatan R. Energy expenditure using three different walking techniques in individuals with spinal cord Injury. Crit Rev Phys Rehab Med. 2019;31(1):35-41.
28. Amberkar O, **Agarwal B**, Singh Y, Shete R, Mullerpatan R. Level of sports participation and performance among people with spinal cord injury. Critical Reviews™ in Physical and Rehabilitation Medicine. 2019;31(1):43-51.
29. Mullerpatan R, Thanawala M, **Agarwal B**, Ganesan S. Development of the Deep Squat Milestone in Typically Developing Children. Critical Reviews™ in Physical and Rehabilitation Medicine. 2019;31(1):63-73.
30. Shetty T, Parab S, Ganesan S, **Agarwal B**, Mullerpatan R. Lower extremity muscle strength and endurance in ambulatory children with cerebral palsy. Critical Reviews™ in Physical and Rehabilitation Medicine. 2019;31(1):75-84.
31. Pisal A, **Agarwal B**, Mullerpatan R. Evaluation of Daily Walking Activity in Patients with Parkinson Disease. Critical Reviews™ in Physical and Rehabilitation Medicine. 2018;30(3):207-218
32. **Agarwal BM**, Deursen RV, Mullerpatan RP. Influence of habitual deep squatting on kinematics of lower extremity, pelvis and trunk. Int J Health Rehabil Sci. 2018;7(1):1-9.



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33. Fernandes N, Gaikwad S, Hemmerich A, Mullerpatan R, **Agarwal B**. Birthing experience of women who have undergone normal delivery in selected community of India. International Journal of Innovative, Knowledge Concepts. 2018;6(2):120-125.
34. **Agarwal B**, Mukri A, Shah M, Ganesan SL, Mullerpatan R. Effect of Inspiratory Muscle Training in Individuals with Parkinson's Disorder. Int J Health Sci Res. 2017;7(6):178-185.
35. Sahasrabudhe SS, **Agarwal BM**, Mullerpatan RP. Comparison of muscle activity and energy cost between various bodyweight squat positions. Clinical Kinesiology: Journal of the American Kinesiotherapy Association. 2017 Jun 22;71(2):19-25.
36. Nair SP, **Agarwal B**, Shah M, Sawant S, Sinha N, Rajguru V, Mullerpatan R. Level of Physical Exercise Capacity, Respiratory Muscle Strength and Peak Expiratory Flow Rate in Healthy Adolescents. Journal of Medical Sciences 2016, June;3(2):66-71.
37. **Agarwal B**, Shah M, Andhare N, Mullerpatan R. Incremental shuttle walk test: Reference values and predictive equation for healthy Indian adults. Lung India: Official Organ of Indian Chest Society. 2016 Jan;33(1):36-41.
38. Nair SP, **Agarwal B**, Shah M, Sawant S, Sinha N, Rajguru V, Mullerpatan R. Level of Physical Exercise Capacity, Respiratory Muscle Strength and Peak Expiratory Flow Rate in Healthy Adolescents. Journal of Medical Sciences 2016, June;3(2):66-71.
39. **Agarwal B**, Chowdhry M, Mullerpatan RP & Kaul SK. (2014). Effect of Movement Therapy on Academic Stress in Physiotherapy Students. Journal of the Medical Sciences, 1, 189-192.
40. Jaimala Shetye and **Bela Garg**. Objective Assessment of improvement following pulmonary rehabilitation. The Journal of IAP;1.13-16:1999-2000 **Bela Garg**, Maria Mascarenus and Surekha Pol .Cardiac Rehabilitation Physical Therapy Rehabilitation, 1996 Duration of the project : 36 months



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Approval from Scientific Advisory Committee Yes

Ethics committee Clearance Yes

Budget requirements (as per the format as Annexure 1B)

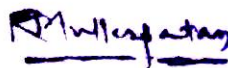
	Year I	Year II	Total (INR)
Recurring			
a. Consumables	2000.00	2000.00	4000.00
b. Travel	-	-	-
c. Contingency	-	-	-
Non-recurring (Cosmed)	-	-	-
	2000.00	2000.00	4000.00


Signature
Principal Investigator

Signature
Co-Investigator



Signature
Head of Department







INSTITUTIONAL ETHICS COMMITTEE
MAHATMA GANDHI MISSION'S DENTAL COLLEGE & HOSPITAL
Junction of NH-4 and Sion Panvel Expressway,
Sector-01, Kamothe, Navi Mumbai- 410 209
Tel: 022- 27436604; Fax: 91-22-27433185; E-Mail:mgmdch@mgmmumbai.ac.in

MGM/DCH/IEC/ 63 /2021

Date:-12 / 7 /2021

To,
Miss Devika Anant Bhosale
PG Student, MGM School of Physiotherapy
Guide - *D. Bela Agarwal (PT)*
Kamothe, Navi Mumbai- 410209

Reference:

1. Your submission of study protocol
2. Study Title: "Exploring effects of pranayam on lung functions in Chronic respiratory condition- A Systematic Review and Meta-Analysis."
3. IEC-MGMDCH referenceno *MGM | DCH | IEC | 63 | 2021*

Dear Miss Devika Anant Bhosale

The IEC- MGMDCH has received and reviewed your submission

Following documents were reviewed in the meeting held on date *9 / 7 / 2021*

1. Application to IERC MGMDCH dt. *25/5/21*
2. Summary of research protocol -
3. Research protocol (Version *6* dt *7/6 /2021*)
4. Amendments to research protocol (Version - Dt *7 / 2021*)
5. Informed consent document (ICD) in English (Version... .dt... /... /2021) - *NA*
6. ICD in Hindi language translated from English (Versiondt. /... /2021) - *NA*
7. ICD in Marathi language translated from English (Version.....dt..... //2021) - *NA*
8. Back translations of ICD from Hindi to English (Version.....dt..... / /2021) - *NA*
9. Back translations of ICD from Marathi to English (Version.dt..... //2021) - *NA*
10. Amendments to the ICD (Versiondt..... //2021) -
11. Case Record Form (CRF) / Study Questionnaire / Study Proforma ✓
12. Principal investigators Current Curriculum Vitae (signed and dated) ✓
13. Subject recruitment procedures: advertisement, letters to doctors, notices
14. Investigator Brochure (IB) – applicable for investigational new drugs (IND)
15. Ethics Committee clearance of other study centers (Total No.)
16. Insurance policy if any
17. Drugs Controller General (India) [DCG(I)] clearance if applicable
18. Investigator's undertaking to DCG(I) if applicable
19. Health Ministry Screening Committee (HMSC) approval if applicable
20. Bhabha Atomic Research Centre (BARC) approval if applicable
21. Genetic Engineering Advisory Committee (GEAC) approval if applicable
22. Director General of Foreign Trade (DGFT) approval if applicable
23. FDA marketing/manufacturing license for herbal drugs. if applicable
24. Other Documents (specify.....)

Page No.

MGM School of Physiotherapy
MGMIHS, Navi Mumbai
Inward / Outward No. *197*
Date *15/7/2021*
Receiver Signature



INSTITUTIONAL ETHICAL COMMITTEE
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Junction of NH-4 and Sion Panvel Expressway,
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MGM/DCH/IEC/ 63 /2021

Date:- 12 / 7 /2021

The following members of the Ethics committee discussed the study documents and voted at the meeting:

Sr.	Name	Role and Responsibility
1.	Dr. Deepak Langade	Chairman, Scientific
2.	Dr. Srivalli Natarajan	Secretary, Scientific
4.	Adv. Dr. Karuna Malaviya	Scientific, Legal
5.	Dr. Shilpa Patel	Scientific, Woman
6.	Dr. Ravindranath VK	Scientific
7.	Dr. Ashvini Padhye	Scientific, Woman
8.	Dr. Jyoti Nadgere	Scientific, Woman
9.	Dr. Sumanthini MV	Scientific
10.	Ms. Nithya Eldho Varghese	Lay person
11.	Mrs. Rupali Gujar	Social worker

Approved
DECISION



INSTITUTIONAL ETHICAL COMMITTEE
MAHATMA GANDHI MISSION'S DENTAL COLLEGE & HOSPITAL
Junction of NH-4 and Sion Panvel Expressway,
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MGM/DCH/IEC/ 63 /2021

Date:- 12 / 7 /2021

Based on the discussion of the submitted documents for the scientific and ethical review, we approve the research protocol to be conducted and its presented form subject to the following conditions:

1. Applicable and mandatory regulatory permissions to be obtained prior to commencement of the study i.e. registration at clinical trial registry of India.(www.ctri.nic.in)
2. The investigators and other participants should be adequately trained on the protocol and its related procedures, the Good Clinical Practices (GCP) guidelines prior to commencing the study.
3. Participating subjects should be adequately enlightened about the protocol during informed consent process and under insurance coverage in an event of any trial related injury/accident.
4. Participating subjects should not be put to additional financial burden related to the study protocol.

The validity of this approval is for two years from date of approval. Within this period, the Institutional Ethics Committee expects to be periodically informed about the following:

- The progress of the study
- Any Serious Adverse Event (SAE) occurring in the course of the study
- Any significant changes in the protocol/patient information/ informed consent
- Update on safety of the investigating product or procedure

To provide an abridge copy of the final report after completion of the study.

Thanking You,

Yours Sincerely

M. Srivalli
Dr. Srivalli Natarajan

Member Secretary

Dr. Srivalli Natarajan

Member Secretary

IERC MGMDCH

Kamothe, Navi Mumbai-410 209.