biology

MDPI

Editorial

Editorial to the Special Issue "Human Bodywork: Applications in Health, Disease, and Rehabilitation"

Redha Taiar

MATériaux et Ingénierie Mécanique (MATIM), Université de Reims Champagne Ardenne, F-51100 Reims, France; redha.taiar@univ-reims.fr

check for updates

Citation: Taiar, R. Editorial to the Special Issue "Human Bodywork: Applications in Health, Disease, and Rehabilitation". *Biology* **2023**, *12*, 451. https://doi.org/10.3390/biology12030451

Received: 7 March 2023
Accepted: 7 March 2023
Published: 15 March 2023

Copyright: © 2023 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

In this research topic, the question concerning how the human body functions through the musculoskeletal system was addressed. The management of human movements requires the control of different body segments which can be coordinated in multiple ways to perform a defined task. The way that the biological system functions in relation to human movement is particularly complex. Therefore, this requires a deep understanding of the interactions between physical sciences (metrology), sciences and technologies of information, and sciences of life (materials, fabrics, organs, and members). The purpose of this Special Issue (SI) is to specify the principles of physiology, functional anatomy, and mechanics to explore and understand biological problems. This can be augmented by human research that facilitates the optimization of human behavior. The researchers' objective for this SI was to summarize the most important parameters influencing human performance, in relation to health sciences in the lives of people from all age groups. In this Special Issue, the researchers were inspired by journal papers that aimed to promote the latest research in the fields of health, quality of life improvement, and sport rehabilitation, and to highlight the recent recommendations. This will help to prevent functional decline and frailty throughout the course of life. This prevention is in the form of a perspective approach via the utilization of the latest research applied in general health and it targets all stages of life. In addition, contributions to this SI aimed at prevention, improved performance, the management of diseases, modelization, simulation, quantification, and the computation of the musculoskeletal system, thus allowing researchers to quantify and improve the disparate parameters characterizing movement in different cases such as sport level, work, and patients' daily lives. The aim of this SI is to effectively combine and coordinate research and results in order to understand and improve human bodywork in medicine, in sport, and at work.

In this Special Issue, thirty-one articles were included which addressed those questions. Twenty-six of them are original trials, along with one review, one systematic review, one protocol, and one tutorial. Herein, we summarize their major contributions according to the subject categories. Overall, the studies showed the importance of this subject in improving the quality of life of patients' lives by expanding upon current evidence; moreover, the studies indicated directions for future research.

The articles all focus on the optimization of the musculoskeletal system and the improvement of patients' quality of life. Many fascinating, high-quality methodologies have been developed across the different articles. We shall now summarize their major contributions according to the subject categories.

In the first category, Freehill et al. [1] and Servant et al. [2] focused on surgery of the musculoskeletal system. In the second category, several authors focused on rehabilitation programs and the improvement of body movement. From the contributing studies in this category, we can mention Martins et al. [3], Cuenca-Zaldivar et al. [4]. Dos Santos et al. [5], Maciejczyk et al. [6], Dufournet et al. [7], Shabat et al. [8], An et al. [9], Martínez-Jiménez et al. [10], Wang et al. [11], Ofran et al. [12], Wang et al. [13], Rostron et al. [14], Silva Caiado et al. [15],

Arenales Arauz et al. [16], Souto Braz et al. [17], and Van Heuvelen et al. [18] with an Reporting Guidelines for Whole-Body Vibration Studies in Humans, Animals and Cell Cultures. In the third category, the optimization of athlete performance was discussed in the papers of Brambilla et al. [19], Strutzenberger et al. [20], and Kiers et al. [21]. In the fourth category, the authors focused on the modelization of the musculoskeletal system by Computational Analysis, the Finite Element Method, and the application of a Machine Learning Algorithms approach on rehabilitation, with submissions by Hong et al. [22], Wang et al. [23], Zhang et al. [24], Antunes et al. [25], Da Cunha de Sá-Caputo et al. [26], Cheung et al. [27], and Lu et al. [28]. In the fifth category, two studies, namely, Rapin et al. [29] and Davahli et al. [30], focused on the impact of COVID-19 on patients in France, USA, and Japan, and one author, De-Yñigo-Mojado et al. [31], focused on the effects of facial skin hair on the fit factor of surgical masks.

2. Conclusions

This Special Issue is highly informative as it relates to the latest research in the field of «health disease and rehabilitation»; moreover, it allows readers to deepen their knowledge and understanding of the complexity of the musculoskeletal system's mechanism.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Freehill, M.T.; Murray, I.R.; Calvo, E.; Lädermann, A.; Srikumaran, U. Shoulder Surgery Postoperative Immobilization: An International Survey of Shoulder Surgeons. *Biology* **2023**, *12*, 291. [CrossRef] [PubMed]
2. Servant, G.; Fourchet, F.; Pernoud, A.; Bothorel, H.; Christofilopoulos, P. Evolution of Hip Muscles Strength in Femoroacetabular Impingement Patients Treated by Arthroscopy or Surgical Hip Dislocation: A Retrospective Exploratory Study. *Biology* **2022**, *11*, 1765. [CrossRef] [PubMed]
3. Martins, C.; Sayegh, S.; Faundez, A.; Fourchet, F.; Bothorel, H. Effectiveness of a Group-Based Rehabilitation Program Combining Education with Multimodal Exercises in the Treatment of Patients with Nonspecific Chronic Low Back Pain: A Retrospective Uncontrolled Study. *Biology* **2022**, *11*, 1508. [CrossRef] [PubMed]
4. Cuenca-Zaldivar, J.N.; Acevedo, A.M.; Fernández-Carnero, J.; Sánchez-Romero, E.A.; Villafañe, J.H.; Carballar, C.B. Effects of a Multicomponent Exercise Program on Improving Frailty in Post-COVID-19 Older Adults after Intensive Care Units: A Single-Group Retrospective Cohort Study. *Biology* **2022**, *11*, 1084. [CrossRef] [PubMed]
5. Dos Santos, J.M.; Rodrigues Lacerda, A.C.; Gonçalves César Ribeiro, V.; Scheidt Figueiredo, P.H.; Ferreira Fonseca, S.; Da Silva Lage, V.K.; Silveira Costa, H.; Pereira Lima, V.; Borja Sañudo, B.; Bernardo-Filho, M.; et al. Oxidative Stress Biomarkers and Quality of Life Are Contributing Factors of Muscle Pain and Lean Body Mass in Patients with Fibromyalgia. *Biology* **2022**, *11*, 935. [CrossRef] [PubMed]
6. Maciejczyk, M.; Bawelski, M.; Więcek, M.; Szygula, Z.; Michailov, M.L.; Vadašová, B.; Kačúr, P.; Pałka, T. Acute Effects of Whole-Body Vibration on Resting Metabolic Rate and Substrate Utilisation in Healthy Women. *Biology* **2022**, *11*, 655. [CrossRef]
7. Dufournet, A.; Ling Chong, X.; Schwitzguébel, A.; Bernimoulin, C.; Carvalho, M.; Bothorel, H.; Lädermann, A. Aquatic Therapy versus Standard Rehabilitation after Surgical Rotator Cuff Repair: A Randomized Prospective Study. *Biology* **2022**, *11*, 610. [CrossRef]
8. Shabat, S.; Meiner, Z.; Tsenter, J.; Schwartz, I.; Portnoy, S. Correlations between Electro-Diagnostic Findings, the Severity of Initial Infection, and the Rehabilitation Outcomes among COVID-19 Patients. *Biology* **2022**, *11*, 277. [CrossRef]
9. An, Y.W.; Kang, Y.; Jun, H.P.; Chang, E. Anterior Cruciate Ligament Reconstructed Patients Who Recovered Normal Postural Control Have Dissimilar Brain Activation Patterns Compared to Healthy Controls. *Biology* **2022**, *11*, 119. [CrossRef]
10. Martínez-Jiménez, E.M.; Pereiro-Buceta, H.; Palomo-López, P.; Navarro-Flores, E.; Jiménez-Cebrián, A.M.; Losa-Iglesias, M.E.; Becerro-De-Bengoa-Vallejo, R.; López-López, D. Repeatability and Reliability of the Rheumatoid Arthritis Foot Disease Activity Index in Spanish Patients: A Transcultural Adaptation. *Biology* **2022**, *11*, 30. [CrossRef]
11. Wang, J.; Qiao, L.; Yu, L.; Wang, Y.; Taiar, R.; Ying Zhang, Y.; Fu, W. Effect of Customized Insoles on Gait in Post-Stroke Hemiparetic Individuals: A Randomized Controlled Trial. *Biology* **2021**, *10*, 1187. [CrossRef] [PubMed]
12. Ofran, Y.; Schwartz, I.; Shabat, S.; Seyres, M.; Karniel, N.; Portnoy, S. Falls in Post-Polio Patients: Prevalence and Risk Factors. *Biology* **2021**, *10*, 1110. [CrossRef] [PubMed]
13. Wang, X.; Deng, L.; Lam, W.K.; Yang, Y.; Xini Zhang, X.; Fu, W. Wearing Cushioning Shoes Reduce Load Rates More Effectively in Post-Fatigue than in Pre-Fatigue during Landings. *Biology* **2021**, *10*, 962. [CrossRef]
14. Rostron, Z.P.J.; Green, R.A.; Kingsley, M.; Zacharias, A. Efficacy of Exercise-Based Rehabilitation Programs for Improving Muscle Function and Size in People with Hip Osteoarthritis: A Systematic Review with Meta-Analysis. *Biology* **2021**, *10*, 1251. [CrossRef]
15. Silva Caiado, V.; Gomes Santos, A.C.; Moreira-Marconi, E.; Moura-Fernandes, M.C.; Seixas, A.; Taiar, R.; Rodrigues Lacerda, A.C.; Sonza, A.; Amaral Mendonça, V.; Da Cunha Sá-Caputo, D.; et al. Effects of Physical Exercises Alone on the Functional Capacity of Individuals with Obesity and Knee Osteoarthritis: A Systematic Review. *Biology* **2022**, *11*, 1391. [CrossRef] [PubMed]

16. Arenales Arauz, Y.L.; Ahuja, G.; Kamsma, Y.P.T.; Kortholt, A.; Van der Zee, E.A.; Van Heuvelen, M.J.G. Potential of Whole-Body Vibration in Parkinson's Disease: A Systematic Review and Meta-Analysis of Human and Animal Studies. *Biology* **2022**, *11*, 1238. [CrossRef] [PubMed]
17. Souto Braz, R.R.; Campos, S.L.; Wanderley Villela, D.; Barreto Antonino, G.; Araújo Batista, P.K.; Guerino, M.R.; Medeiros Rodrigues, F.T.; Pereira Alves, K.F.; Torres Duarte, J.V.; De Andrade Silva, D.; et al. Effectiveness of Whole-Body Vibration Combined with Multicomponent Training on the Risk of Falls and Quality of Life in Elderly Women with Osteoporosis: Study Protocol for a Randomized Controlled Clinical Trial. *Biology* **2022**, *11*, 266. [CrossRef] [PubMed]
18. Van Heuvelen, M.J.G.; Rittweger, J.; Judex, S.; Sañudo, B.; Seixas, A.; Fuermaier, A.B.M.; Tucha, O.; Nyakas, C.; Marín, P.J.; Taiar, R.; et al. Reporting Guidelines for Whole-Body Vibration Studies in Humans, Animals and Cell Cultures: A Consensus Statement from an International Group of Experts. *Biology* **2021**, *10*, 965. [CrossRef]
19. Brambilla, C.; Malosio, M.; Reni, G.; Scano, A. Optimal Biomechanical Performance in Upper-Limb Gestures Depends on Velocity and Carried Load. *Biology* **2022**, *11*, 391. [CrossRef]
20. Strutzenberger, G.; Ellenberger, L.; Bruhin, B.; Frey, W.O.; Scherr, J.; Spörri, J. Deadbug Bridging Performance in 6- to 15-Year-Old Competitive Alpine Skiers—A Cross-Sectional Study. *Biology* **2022**, *11*, 329. [CrossRef]
21. Kiers, K.; Ellenberger, L.; Javet, M.; Bruhin, B.; Walter, O.; Frey, W.O.; Spörri, J.A. Cross-Sectional Observation on Maximal Eccentric Hamstring Strength in 7- to 15-Year-Old Competitive Alpine Skiers. *Biology* **2021**, *10*, 1128. [CrossRef] [PubMed]
22. Hong, T.T.-H.; Wang, Y.; Wong, D.W.-C.; Zhang, G.; Tan, Q.; Chen, T.L.-W.; Zhang, M. The Influence of Mattress Stiffness on Spinal Curvature and Intervertebral Disc Stress—An Experimental and Computational Study. *Biology* **2022**, *11*, 1030. [CrossRef]
23. Wang, X.; Liu, R.; Zhang, T.; Shan, G. The Proper Motor Control Model Revealed by Wheelchair Curling Quantification of Elite Athletes. *Biology* **2022**, *11*, 176. [CrossRef] [PubMed]
24. Zhang, O.; Zhang, Y.; Huang, J.; Teo, E.C.; Gu, Y. Effect of Displacement Degree of Distal Chevron Osteotomy on Metatarsal Stress: A Finite Element Method. *Biology* **2022**, *11*, 127. [CrossRef]
25. Antunes, M.; Quental, C.; Folgado, J.; De Campos Azevedo, C.; Ângelo, A.C. Shoulder Positioning during Superior Capsular Reconstruction: Computational Analysis of Graft Integrity and Shoulder Stability. *Biology* **2021**, *10*, 1263. [CrossRef] [PubMed]
26. Da Cunha de Sá-Caputo, D.; Sonza, A.; Coelho-Oliveira, A.C.; Pessanha-Freitas, J.; Silva Reis, A.; Francisca-Santos, A.; Dos Anjos, E.M.; Paineiras-Domingos, L.L.; De Rezende Bessa Guerra, T.; Da Silva Franco, A.; et al. Evaluation of the Relationships between Simple Anthropometric Measures and Bioelectrical Impedance Assessment Variables with Multivariate Linear Regression Models to Estimate Body Composition and Fat Distribution in Adults: Preliminary Results. *Biology* **2021**, *10*, 1209. [CrossRef]
27. Cheung, J.C.W.; Yiu-Chau Tam, A.; Chan, L.C.; Chan, P.K.; Wen, C. Superiority of Multiple-Joint Space Width over Minimum-Joint Space Width Approach in the Machine Learning for Radiographic Severity and Knee Osteoarthritis Progression. *Biology* **2021**, *10*, 1107. [CrossRef]
28. Lu, Z.; Sun, D.; Xu, D.; Li, X.; Baker, J.S.; Gu, Y. Gait Characteristics and Fatigue Profiles When Standing on Surfaces with Different Hardness: Gait Analysis and Machine Learning Algorithms. *Biology* **2021**, *10*, 1083. [CrossRef]
29. Rapin, A.; Noujaim, P.J.; Taiar, R.; Carazo-Mendez, S.; Deslee, G.; Damien Jolly, D.; Boyer, F.C. Characteristics of COVID-19 Inpatients in Rehabilitation Units during the First Pandemic Wave: A Cohort Study from a Large Hospital in Champagne Region. *Biology* **2022**, *11*, 937. [CrossRef]
30. Davahli, M.R.; Karwowski, W.; Fiok, K.; Murata, A.; Sapkota, N.; Farahani, F.V.; Al-Juaid, A.; Marek, T.; Taiar, R. The COVID-19 Infection Diffusion in the US and Japan: A Graph-Theoretical Approach. *Biology* **2022**, *11*, 125. [CrossRef]
31. De-Yñigo-Mojado, B.; Becerro-de-Bengoa-Vallejo, R.; Losa-Iglesias, M.E.; Madera-García, J.; Rodríguez-Sanz, D.; Calvo-Lobo, C.; López-López, D.; Angulo-Carrere, M.T.; San-Antolín, M. Facial Hair Decreases Fit Factor of Masks and Respirators in Healthcare Providers. *Biology* **2021**, *10*, 1031. [CrossRef] [PubMed]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.