Fatemeh Keshavarzi

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Objective

Seeking a postdoctoral or a PhD position to advance innovative assistive device design, user-centered design of orthotic and prosthetic devices, leveraging my expertise in biomechanics, CAD, and innovative orthosis, prosthetic sockets and exoskeletons development.

Education

PhD in Orthotics and Prosthetics 2021–2025
University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
Dissertation: “Design and fabrication of an intelligent local vibration system and A comparison between the effect of conventional TLO and TLO fitted with local vibration therapy system on Kyphosis angle, isometric strength of back extensor muscles and pain in Hyperkyphotic elderly.”
Advisor: Dr. Mokhtar Araz pour

Master’s Degree in orthotics and Prosthetics 2018–2020
Iran University of Medical Sciences, Tehran, Iran
Thesis: “The Effect of Postural supportive corset on back extensor muscles performance in the elderly with hyperkyphosis”
Advisor: Dr. Fatemeh Azadinia

Bachelor’s Degree in orthotics and prosthetics 2012–2016
Iran University of Medical Sciences, Tehran, Iran
Note: Completed clinical internship in orthotics and prosthetics as part of degree requirements, 6 moths in Red Crecent Society in Tehran and 6 moths in Kosar clinic (Specialized clinic for Iranian Veterans in Tehran).

Publications:

1. M Arazpour, F Keshavarzi, SA Gard. March 2025. Prosthetics and Orthotics International. "The effects of virtual reality environment simulations on balance and gait rehabilitation in persons with lower extremity amputation". DOI: 10.1097/PXR.0000000000000428.

2. Fatemeh Keshavarzi, Roshanak Baghaei, Yeganeh Aliannejad, Sina Rezaei. February 2025. JPO Journal of Prosthetics and Orthotics 37(2). "Orthotic Interventions in Children's and Adolescent's Lower-Limb Transverse Plane Rotational Malalignments (A Systematic Review)". DOI: 10.1097/JPO.0000000000000555.

3. Fatemeh Keshavarzi, Mokhtar Arazpour. August 2024. Journal of Rehabilitation and Assistive Technologies Engineering. 11(4) License CC BY-NC 4.0. "Effect of spinal orthoses on osteoporotic elderly patients kyphosis, back muscles strength, balance and osteoporotic vertebral fractures:(A systematic review and meta-analysis)". DOI: 10.1177/20556683241268605.

4. F Keshavarzi, F Azadinia, S Talebian, O Rasouli. February 2023. Journal of Bodywork and Movement Therapies. "Test-retest reliability of a novel method for trunk position sense measurement in older adults with and without hyperkyphosis". DOI: 10.1016/j.jbmt.2023.02.002.

5. F Keshavarzi, F Azadinia, S Talebian, O Rasouli. April 2022. Disability and Rehabilitation. "Effect of a semi-rigid backpack type thoracolumbar orthosis on thoracic kyphosis angle and muscle performance in older adults with hyperkyphosis: a randomized controlled trial". DOI: 10.1080/09638288.2022.2065541

6. F Keshavarzi, F Azadinia, S Talebian, O Rasouli. Journal of manual & manipulative therapy, February 2022. The 30(2):1-9. "Impairments in trunk muscles performance and proprioception in older adults with hyperkyphosis" DOI: 10.1080/10669817.2022.2034403

7. F Keshavarzi, F Azadinia, S Talebian, O Rasouli. November 2021. Musculoskeletal Science and Practice 58(4):102475. "Test-retest reliability of a load cell setup, Ito, and timed loaded standing tests for measuring muscle strength and endurance in older adults with and without hyperkyphosis" DOI: 10.1016/j.msksp.2021.102475

Three articles that two of them is about my PhD project is published or accepted and you can see publication updates in my ORCID.

1. **Title:** The Effect of a Fully Immersive Virtual Reality Training Program on Walking Parameters in People with Unilateral Below-Knee Amputation. (health Science Reports), Author names and affiliation: Reza Vahab Kashani, 2, 3. Mokhtar Arazpour, 2, 3. Akbar Biglarian, 4. Fatemeh Keshavarzi, 1, 3.
2. **Title: Effect of a Spinal Orthosis with Leaf Spring and Programmable Local Vibration on Kyphosis Angle and Trunk Muscle Strength in Hyperkyphosis: A Technical Note and Feasibility Evaluation. Fatemeh Keshavarzi, Mokhtar Arazpour, Saeed Behzadipour Submitted to: JMIR Biomedical Engineering on: August 07, 2025**
3. **Title: The relationship between the severity of age-related hyperkyphosis and the functional capacity of trunk muscles in the sagittal plane.**
   Author names and affiliation: (Archive of Gerontology) Fatemeh Keshavarzi, 1, 3. Mokhtar Arazpour, 2, 3. Iraj Abdollahi, 4. Akbar Biglarian, 5. Saeed Behzadipour, 6,7.

Research Impact

• H-index: 5 (Source: Google Scholar) and 3 (Source: web of sciences).

• Total Citations: 34 (Source: ResearchGate), 30 (Source: Google Scholar) of May 2025.

National patents:

1. Local vibration orthosis for age related hyperkyphosis

   This patent describes a local vibration system with programming options via Arduino, integrated into a semi-rigid thoracolumbar orthosis that features leaf spring paraspinal bars.

   The patent number:108711

2. Tool for evaluation of back extensor muscle strength and endurance

   This patent describes a chair that incorporates a Lutron strain gauge to evaluate the isometric strength, endurance, and force sense of back extensor muscles, as we have not yet used an isokinetic dynamometer.

   The patent number:102304

IRCT Iranian Registry of Clinical trial:

1. Design and fabrication of an intelligent local vibration system and A comparison between the effect of conventional TLO and TLO fitted with local vibration therapy system on

Kyphosis angle, isometric strength of back extensor muscles and pain in Hyperkyphotic elderly. (2023-02-14/ IRCT20190811044505N2).

2. The effect of postural supportive corset on kyphosis angle and back extensor muscle performance in the elderly with hyperkyphosis. (2020-04-06/ IRCT20190811044505N1).

Research Projects:

Three research projects were completed at the Iran University of Medical Sciences, along with two additional projects derived from my Master's and PhD work.

Design

My design portfolio is accessible via my LinkedIn profile. These designs are generated using prompts in artificial intelligence, without the use of CAD data. Approximately one year ago, I established a company focused on research and development in orthotics design. However, the venture is currently inactive due to constraints related to time and financial resources, given my commitments as a PhD candidate. I aspire to secure sufficient resources and time in the future to dedicate to new design initiatives.

Certifications

• **Nature Reviews Certification** (about six one), 2024/2025. Completed peer-review training for Journals including Scientific Reports, Journal of Orthopaedic Surgery and Research, BMC Musculoskeletal Disorders.

• **Teaching Certification** in Statistics, University of Social Welfare and Rehabilitation Sciences, 2021/2022/2023/2024. Trained in statistical analysis, methods for research and education.

• **Systematic Reviews and Meta-Analysis Certification**

1. Certificate of course completion (Network meta-analysis). Tehran University of Medical Sciences, Issued Mar 2024, (Credential ID: NM-001-08).
2. Certificate of course completion (Systematic Review and meta-analysis). Tehran University of Medical Sciences, Issued June 2023, (Credential ID: SR49-001-03).
3. Certification of course completion (Umbrella reviews). Tehran University of Medical Sciences, Issued October 2023, (Credential ID: UR-001-03).
4. Certification of completion (Rabid Systematic Review Workshop). Cochrane. (Credential ID: 110507)

• **Gait analysis, IMU, and MATLAB certification:**

1. Cognitive game development in unity and IMU sensors processing data. (Sharif University of Technology), (Credential ID 14031219427).
2. Motion analysis skills. (Sharif University of Technology), (Credential ID AT-02-SN-37104).

3. Introductory MATLAB course for MOCAP data analysis. (Sharif University of Technology), (Credential ID AT-03-SN-47804).

• **AI certification:**

1. Interaction workshop on Human Biomechanical modeling and Applications of Robotic and Artificial Intelligence in Rehabilitation. (School of Mechanical Engineering, College of Engineering, University of Tehran).

• **Design Skills:** CAD (SolidWorks, AutoCAD), human-centered design, ergonomic optimization.

• **Technical Skills:** Prosthetics, Orthotics (focused on spine), MATLAB, statistical analysis (SPSS/R), Isokinetic Dynamometry.

• **Soft Skills:** Interdisciplinary collaboration, project management, scientific writing, peer review, teaching.

References: Available in my LinkedIn and for some parts upon request.