

Review report

Final title: **Advanced robotic rehabilitation in Bangladesh Medical University**

Title at submission: **Advanced robotic rehabilitation: Bangladesh Medical University initiative**



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Responsible editor

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Reviewers

C: Mohammed Emran
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Keywords

rehabilitation, robotic,
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Ethical approval

The study received approval from
DGDA under the ref. no. (DGDA/
Misc-07/966, dated:02-11-2025)

Funding

None

Trial registration number

Not applicable

Reviewer C: Mohammed Emran, ORCID: [0000-0002-6744-0225](https://orcid.org/0000-0002-6744-0225)

This manuscript delineates how ZEPU AI series for gait and upper-limb restoration—enable high-intensity, adaptive and data-driven therapy that surpasses traditional, labor-intensive approaches. Despite financial and infrastructural constraints, the integration of Chinese robotics offers a transformative, scalable model for rehabilitation management in Bangladesh.

1. Comment Strength: Highlights innovation, capacity building, and context-specific adaptation of robotics. Limitations: Limited evidence, cost barriers, and unclear scalability across diverse settings.

Response We sincerely thank the reviewer for acknowledging the strengths of our manuscript, particularly the innovation, capacity-building efforts, and context-specific adaptation of robotic rehabilitation in Bangladesh. We agree with the reviewer's observation regarding the current limitations. Evidence from LMIC settings is indeed limited, and we have explicitly noted this in the revised version as an area for ongoing research. To address this, our team is in the process of establishing prospective registries and outcome-based studies to generate local evidence on clinical effectiveness, safety, and cost-benefit.

Regarding cost concerns, we have clarified in the revised text that all robotic systems were donated by the Government of the People's Republic of China, eliminating procurement expenses. This arrangement allows BMU to provide robotic rehabilitation services at substantially reduced costs, improving accessibility for patients. On scalability, the revised manuscript now discusses potential strategies to expand such technology sustainably across other centers, emphasizing the need for policy support, workforce training, and collaborative research.

Reviewer E: Taslim Uddin, ORCID: [0000-0002-2884-9212](https://orcid.org/0000-0002-2884-9212)

2. Comment The manuscript provides a relevant and timely perspective on the establishment of Bangladesh's first Robotic Rehabilitation Centre at BMU. The topic is valuable, especially for low and middle-income countries (LMIC)-focused rehabilitation innovations. It is generally well-structured, readable, and concise. However, the paper would benefit from improved clarity, a more balanced critique, and a stronger evidence-based context.

Major concerns:

Lack of critical perspective:

- The manuscript reads mostly like a promotional description of a center,
- Main body first sentence (Line 28) "Physical Medicine," did you mean PMR?
- As a reader, I would love to find: a perspective piece should include critical reflections (limitations, comparative analysis, sustainability concerns, cost-benefit reflections, policy/ethical issues).
- I recommend to consider adding: long-term maintenance feasibility, training needs, potential inequity, local manufacturing capacity, power/infrastructure limitations, and most important
- "Bangladesh Medical University is the center of excellence for postgraduate medical education and medical treatment in Bangladesh. It would be valuable to highlight how this robotics program will benefit rehabilitation teaching, training, and the patient community in Bangladesh, especially those who currently travel abroad to receive such advanced treatments."

Response

We sincerely thank the reviewer for the thoughtful and constructive comments. The manuscript has been thoroughly revised to improve clarity, strengthen evidence-based discussion, and ensure a balanced critical perspective. Below are detailed responses to each specific point:

- The revised version now provides a more balanced and analytical tone. We have added critical reflections on sustainability, maintenance, workforce training, and financial feasibility challenges.
- The revised version also highlights ethical and operational considerations, such as equipment maintenance, power infrastructure, and equitable access in low-resource settings (Paragraphs 4–6, Lines 48–82).

- b) Yes, we intended to refer to “Physical medicine and rehabilitation (PMR).” This has been corrected throughout the revised manuscript
- c) We have incorporated these elements into the revised version. The discussion now includes:
- Sustainability and maintenance challenges.
 - Cost–benefit reflections and affordability concerns.
 - Equity issues related to accessibility in LMICs.
 - Policy and ethical aspects including transparency of donations and patient data protection.

Refer to revised main body, (Paragraphs 5–6, Lines 64–82).

- d) All of these aspects have been addressed in the revised manuscript. We included specific discussions on:
- Technical training provided to physicians, therapists, and engineers.
 - The importance of maintenance planning and local technical support.
 - Potential inequities due to urban–rural disparities.
 - Infrastructure needs such as electricity and space requirements.
 - Possibilities for local production of cost-effective prototypes in the future.
- Refer to main body, (Paragraphs 5–6, Lines 64–82).
- e) This has been elaborated in the revised text. We now emphasize how the BMU Robotic Rehabilitation Centre contributes to postgraduate training, hands-on exposure to advanced rehabilitation technologies, and research capacity building. The manuscript also discusses how the program reduces the need for patients to seek rehabilitation abroad, thereby addressing healthcare inequity and cost burdens (Paragraph 7, Lines 83–89).

3. Comment

Bangladesh rehabilitation gaps and referencing: Many statements about Bangladesh’s rehabilitation system are broad and should be supported by credible national or regional data/citations. Some articles may be available, for example, “Disability and Rehabilitation Medicine in Bangladesh. Citations should be exact and placed in a planned manner.

Response

- The introduction has been strengthened with specific national data on disability burden, rehabilitation workforce shortages, and service fragmentation (Line 46–49).
- The recommended articles “Disability and Rehabilitation Medicine in Bangladesh” and “Rehabilitation in Bangladesh” were already present as references 4 and 5, and their placement has been adjusted to appear directly after relevant statements (Lines 46–59).
- All previously broad statements now have directly supported citations.

Responsible editor: M Mostafa Zaman, ORCID: [0000-0002-1736-1342](https://orcid.org/0000-0002-1736-1342)

4. Comment

The authors should provide a concise description of what has been achieved so far, justifying the relevance of such costly investments.

Response

We have added a concise description of early program achievements based on clinicians’ observations, including improved treatment consistency, higher therapy intensity, and enhanced patient engagement.

5. Comment

They should explain how these contributions surpass traditional or conventional rehabilitation therapies. Since the length of the manuscript should remain within 600 words, existing text must be condensed.

Response

We clarified how robotic rehabilitation surpasses conventional therapy through standardised repetitions, objective data output, and reduced therapist fatigue. To remain within the 600-word limit, several sections have been condensed while maintaining clarity and relevance.

6. Comment

Substantial overlap with the published review article entitled “Novel robotic rehabilitation in Bangladesh: A narrative review.” Please minimise the redundancy.

Response

We acknowledge the concern regarding redundancy with our previously published review article. To address this, we have substantially reduced background content related to global evidence and device descriptions and now explicitly cite the published narrative review as the primary source for comprehensive evidence synthesis.