Preliminary Evaluation of the Implementation Potential of Transcranial Magnetic Stimulation for Veterans Using the DART-RT

Amy M. Kemp, PhD CCC-SLP[1]; Courtney Celian, OT[2], Sandra Kletzel, PhD[3], Bridget Cotner, PhD[3], Miriam Rafferty, DPT, PhD[2], Amy Herrold, PhD[3]

[1]Washington State University, Department of Speech and Hearing Sciences; [2]Shirley Ryan AbilityLab; [3]Edward Hines VA Hospital

Background

- Repetitive transcranial magnetic stimulation (rTMS), a non-invasive neuromodulation technique that has been used for neurological rehabilitation, including improving motor function, reducing depressive symptoms, managing chronic pain, and enhancing cognitive outcomes after stroke or traumatic brain injury (TBI).
- End-user feedback is a critical component of the development and implementation process for rehabilitation technologies.
- rTMS shows promise for various clinical applications, but its readiness for routine use varies between applications for different populations.

Objectives

- Evaluate the implementation potential of rTMS for different populations and outcomes.
- **Hypothesis:** the DART-RT would distinguish between established uses (treatment for depression) and investigational applications (bipolar depression versus TBI) of rTMS

Methods

- Fifteen healthcare providers and research personnel with experience in various TMS applications were recruited from a single VA hospital.
  - Specifically, the sample comprised 3 research-only staff and 12 combined clinical provider/research staff.
- Participants rated the implementation potential of rTMS for three clinical applications: depression, bipolar depression, and traumatic brain injury (TBI).

Descriptive Analysis

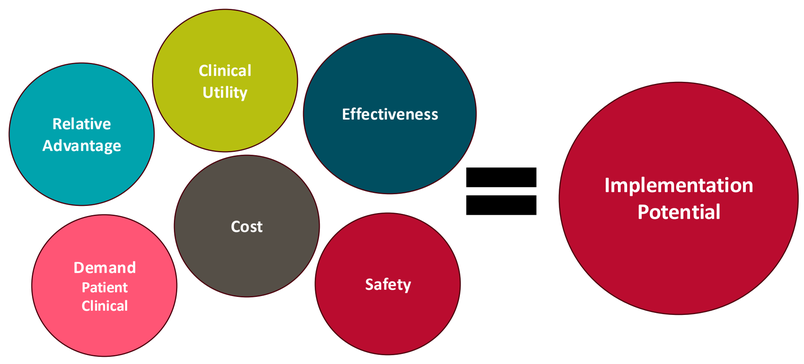
- Survey responses were analyzed descriptively using means and standard deviations to summarize participants' ratings (range: 1–5) across each domain of the DART-RT and for each TMS clinical application (depression, bipolar depression, and TBI).

Comparative Analysis

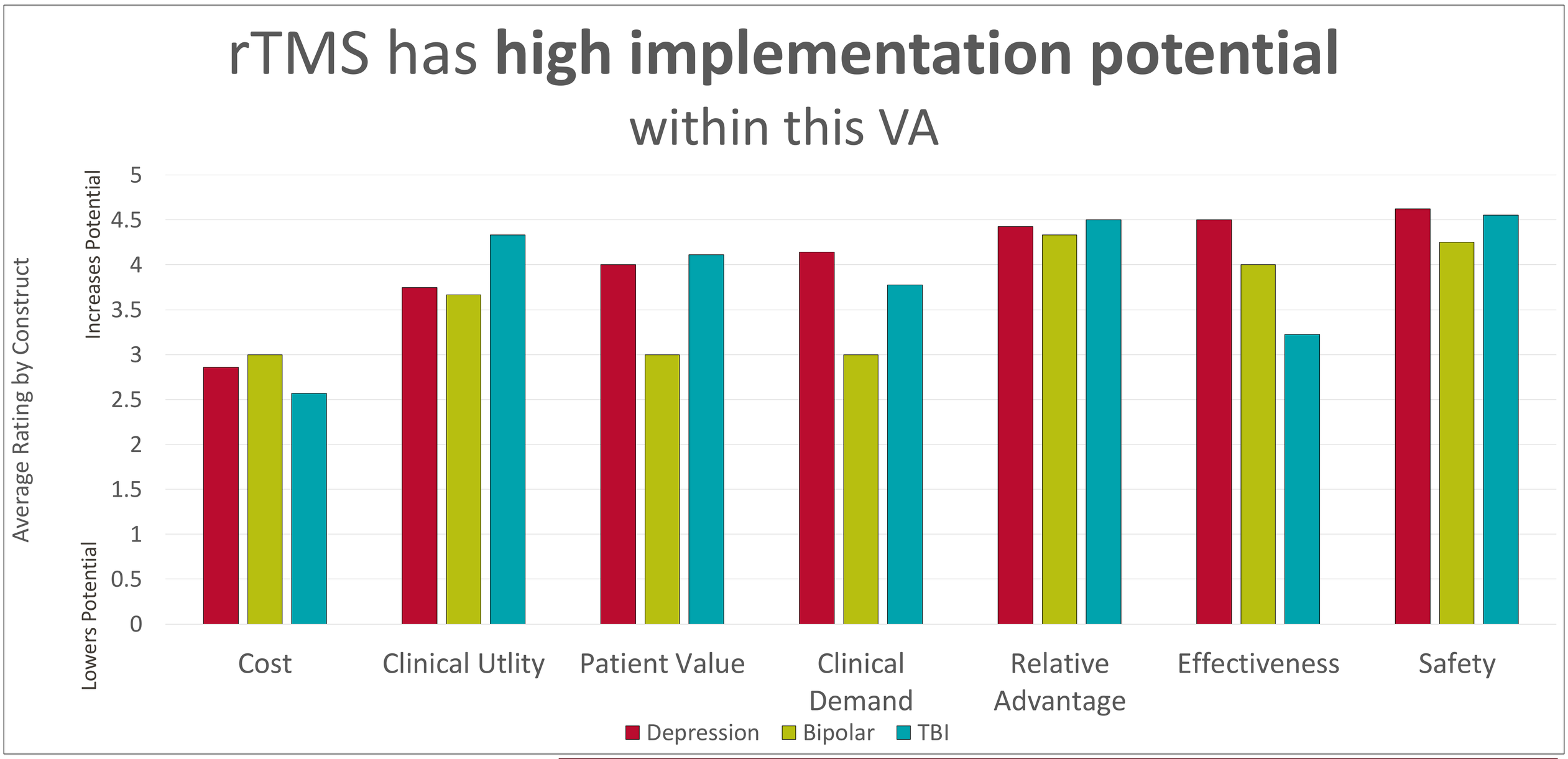
- Mean scores were compared across the clinical applications to identify differences in ratings using a Kruskal-Wallis Test.

DART-RT Survey Tool

- **Designing for Accelerated Translation of Rehabilitation Technology (DART-RT)** survey tool uses a 5-point scale (1 = low potential, 5 = high potential).
- It is based on the framework by Ramsey et al. that proposes seven key factors that influence the adoption of technologies.

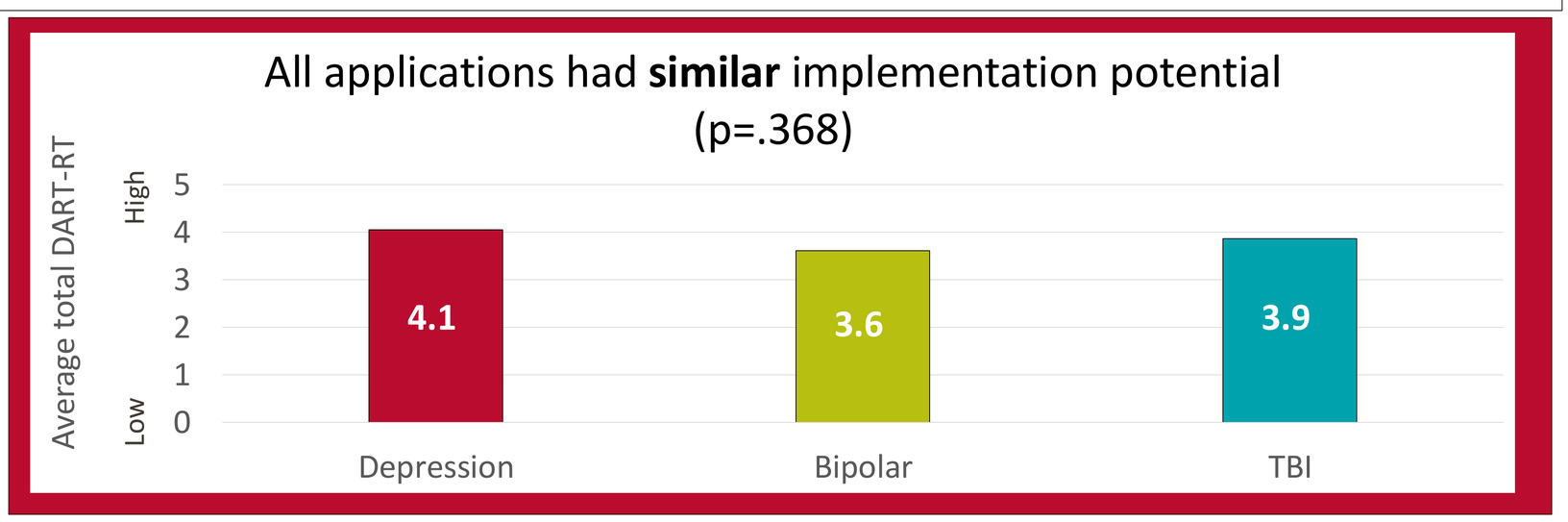


Results



Key Take-Aways

- rTMS was rated to have high **clinical utility, relative advantage, and safety**
- Cost negatively impacted implementation potential
- **Only effectiveness** clearly delineated between established use and investigational uses



Discussion

- **Cost** neutrally affects implementation potential
- rTMS is generally considered **safe** for all applications
- rTMS for depression received the highest **effectiveness** rating (reflecting established use), and use for TBI had lowest (reflecting early investigational use)
- High **clinical demand, patient values, and utility** ratings for TBI suggest considerable clinician interest in expanding rTMS applications to address unmet rehabilitation needs.
  - rTMS for Bipolar depression had **neutral demand** (patient and clinician)
- There is **high relative advantage** to the use of rTMS in these populations
- Adoption in clinical practice is influenced by perceived relevance and patient demand, indicating opportunities for strategic implementation efforts
- Leveraging user-centered evaluation tools, such as the DART-RT, can guide evidence-informed integration of neuromodulation technologies into clinical care.

Limitations

- The generalizability is limited by the small sample size and the predominance of participants from provider roles. Participants were from a single VA hospital system which may not reflect broader institutional perspectives.
- Ratings were self-reported, reflecting subjective perceptions rather than objective implementation data. Most respondents had the most experience in TBI and Depression which could have influenced the results and ratings.

Disclaimer: The view expressed in this poster are the authors' and do not necessarily represent the views of the Department of Veterans Affairs or the United States Government.

References

Contact

Take the DART-RT!

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