

Supplementary Methods

Participant inclusion and exclusion criteria

Older adults with major depressive disorder were recruited for enrollment. The main inclusion criteria were individuals aged 60 to 85, a diagnosis of major depressive disorder (DSM-5 criteria), a score of ≥ 20 on the 24-item Hamilton Depression Rating Scale, and treatment resistance to antidepressant pharmacotherapy during the current episode. Specifically, eligible participants were required to have ≥ 1 failed antidepressant trial(s) or an inadequate trial (e.g., intolerance) to ≥ 2 antidepressants during the current episode.

Key exclusion criteria included a diagnosis of Axis I disorders other than depression, although individuals with anxiety disorders or Axis II disorders were eligible if these were not their primary diagnosis. We excluded individuals with active suicidal behavior, substance use, possible signs of dementia or mild/major neurocognitive disorder (a score of < 24 on the Mini Mental Status Exam), prior unsuccessful electroconvulsive therapy (ECT), and contraindications to repetitive transcranial magnetic stimulation, which include pacemakers, a history of epilepsy or seizures, brain tumors or surgery, metal implants in or around the head, brain trauma, neurological disorders (i.e., multiple sclerosis, amyotrophic lateral sclerosis, or Parkinson's disease), stroke, encephalitis, spinal cord injury, and significant brain injury.

Supplementary Table S1 Detailed account of recruitment strategies

Recruitment strategy	Account of implemented methods
Community engagement	- Starting in November 2023, we emailed various groups and organizations with a request to help spread awareness of our study, including the McMaster Institute for Research on Aging, McMaster Alumni, McMaster's Student Wellness Centre, and the senior citizen center Shalom Village. - We spread awareness of our study by incorporating study information in the Centre for Medicinal Cannabis Research newsletter. - In January 2024, we decided to enhance recruitment by broadening our outreach methods to eight local psychiatrists in the Greater Hamilton community who were contacted by the principal investigator via email. These organizations and local psychiatrists were provided with a digital copy of our recruitment flyer and patient information sheet. - The recruitment flyer contained basic information regarding participant eligibility (i.e., 60 to 85 years old with a diagnosis of depression) and the contact information of our research center. The patient information sheet was designed to explain the study intervention in lay terms, aiming to increase accessibility for non-scientific audiences. The information sheet also provided contact information for potential participants to inquire about the study.
Providing information to family medical clinics	- Research assistants were responsible for handing out recruitment flyers, patient information sheets, and physician information sheets to family medical clinics. These clinics were visited in November 2023. Flyers and information sheets were posted or placed on walls and tables within patient waiting areas after receiving consent from the medical staff. - The recruitment flyer contained basic information regarding participant eligibility (i.e., 60 to 85 years old with a diagnosis of depression) and the contact information of our research center. - The patient information sheet was designed to explain the study intervention in lay terms, aiming to increase accessibility for non-scientific audiences. The information sheet also provided contact information for potential participants to inquire about the study. - The physician information sheet provided a more thorough explanation of the dTMS intervention from a scientific and medical perspective.

Health care provider outreach in the affiliated inpatient and outpatient mental health clinics[†]

- As the study began (April 2023), we connected with several inpatient and outpatient clinics within St. Joseph's Healthcare Hamilton, including the Mood Disorders Clinic, Seniors Mental Health Outpatient Clinic, and the ECT/Transcranial Magnetic Stimulation Service.
- We targeted case managers, nurses, psychiatrists, geriatricians, psychologists, and research coordinators in the St. Joseph's inpatient and outpatient networks. Health care providers and research personnel were invited to refer eligible candidates to our study.
- On May 5, 2023, during early recruitment, an email was sent to a large directory of physicians, containing information about the study's objectives, eligibility criteria, and contact information.
- The principal investigator regularly checked in with physician colleagues to inquire if they had potentially eligible participants.
- Research assistants were responsible for regularly communicating with outpatient clinics to remind them of our ongoing study. We provided these outpatient clinics with a basic description of our study, the main inclusion and exclusion criteria, as well as our recruitment flyer and info-sheets.
- Two research assistants attended a staff meeting on January 15, 2024 at the Seniors Mental Health Outpatient Clinic to inform case workers of how they could share our study with patients whom they believed would be ideal candidates.
- Research assistants and the principal investigator met with the Community Outpatient and Outreach Programs manager at the Seniors Mental Health Outpatient Clinic on multiple occasions to develop an effective strategy for collaborating and collectively referring potential candidates to our study.
- Research assistants were responsible for meeting with the manager at the Mood Disorders Clinic to discuss the referral process and how they could direct older patients to our research facility for further inquiries about the study.
- Two research assistants and the principal investigator collaborated with staff members at the ECT/Transcranial Magnetic Stimulation Service to inform them of our study's aims and the participant eligibility criteria.

Newspaper advertising

- We advertised in a local newspaper, *Coffee News*, targeting residents of Hamilton, Ontario, Canada. *Coffee News* reports an estimated ten million readers per week, identifying the newspaper as a potential recruitment platform to broadly target Hamilton residents.
- The advertisement contained key information regarding participant eligibility (i.e., 60 to 85 years old with a diagnosis of depression) and the contact information of the research coordinator.
- The advertisement was published on December 25th, 2023, and ran for four weeks, costing a total of CAD 366.40. However, considering the high cost and the low number of referrals generated, this method was terminated after four weeks.

Online advertising

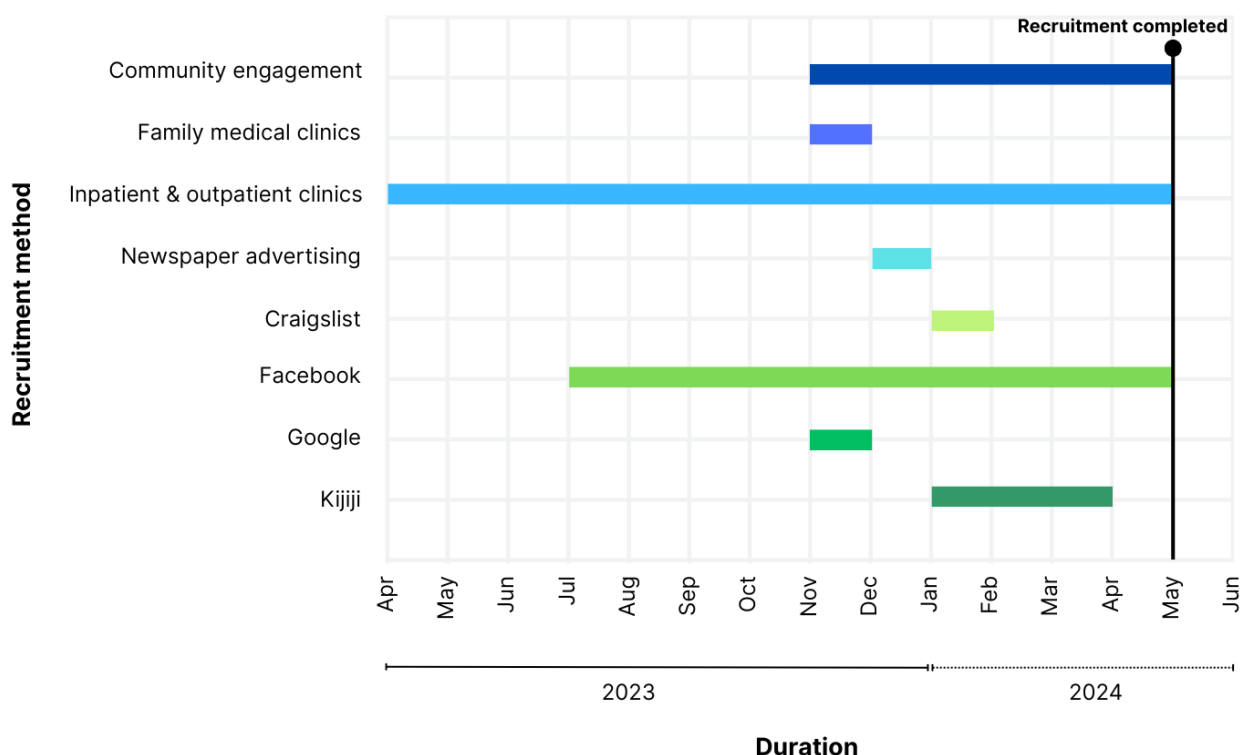
- We created online advertisements using several platforms: Craigslist, Facebook, Google, and Kijiji. Individuals from the community were able to self-refer by completing an online screening questionnaire assessing their eligibility, which was linked to the advertisements.
- For all online advertising platforms, geographical settings were enabled to selectively target individuals in the Greater Hamilton Area (Ontario, Canada).
- Paid Facebook advertisements were intermittently posted from July 2023 until May 2024, when the study ended. For a detailed list of the specific periods during which Facebook advertisements were posted, please refer to the Supplementary Table S3. The online advertisements contained an

image of the study flyer, with a brief description of eligible candidates (i.e., 60 to 85 years old and diagnosed with depression). Research personnel screened each entry and contacted individuals who appeared to be eligible and interested in participating.

- Due to low recruitment rates between December 2023 and January 2024, additional online recruitment measures were implemented. Our first strategy was to advertise on Google and Facebook. The Google ad was posted for four weeks beginning November 22, 2024 and cost CAD 30. However, this advertisement was terminated after the four-week period due to a lack of referrals.
- We also posted unpaid Craigslist and Kijiji advertisements on January 9, 2024 to determine whether these additional sources could produce a considerable volume of referrals. Due to a lack of referrals, the Craigslist advertisement was terminated after the 30-day period.
- Kijiji advertisements were posted for 30 days at a time beginning on January 9 2024 and were terminated on April 3 2024 due to low recruitment.

[†] Located in the St. Joseph's Healthcare Hamilton Network.

Supplementary Figure S1 Duration of recruitment methods



Various recruitment methods were employed from the beginning of the study, in April 2023, to the end of the recruitment period, in May 2024.

Detailed recruitment cost and time estimation

Recruitment time was estimated based on self-reports provided by all research personnel involved in the study. Given the retrospective nature of this analysis, research staff were asked after the study concluded to provide detailed estimates of the time (in hours) spent on each

recruitment method (e.g., Facebook, Craigslist, health care provider outreach). This included activities such as telephone screenings, in-person screening, scheduling, emailing potential participants, and the time devoted to establishing recruitment methods (e.g., creating Facebook advertisements). The hours reported by each staff member were summed to calculate the total time spent per recruitment source.

Cost components included online advertising fees (e.g., Facebook ad budget) and newspaper advertisement charges. Research assistants involved in recruitment from the start of the recruitment phase contributed to the enrollment-cost analyses. The median hourly wage of research assistants in Ontario was used to estimate labor costs, as detailed in the Methods section of the main manuscript.

Qualitative semi-structured interview procedure

The qualitative interview was a semi-structured, verbal interview designed to ask participants about their experience before, during, and after the study. The interview was conducted at the 2-week follow-up and lasted approximately 15 minutes. A research assistant asked participants the following open-end questions, and their responses were documented in detailed notes. Participants were encouraged to be as honest and transparent in their responses as possible. Of note, qualitative interview questions were designed to assess the participants' experiences before, during, and after the study. These data were retrospectively analyzed to explore recruitment outcomes, and verbal themes were manually identified to highlight potential facilitators and barriers to recruitment.

- What was your overall experience participating in this study?
- What were your expectations before entering the study?
- How was your experience during the study?
- How have these past 2 weeks been after the study?
- What are some things you may have liked or disliked? (Think about the schedules, staff, the dTMS treatments, other research components of the study, session length, etc.)
- Was this treatment comfortable and tolerable for you?
- What are some things you would change to make it more tolerable and better suited to your needs?
- Did the frequency of treatment (5 days a week for 4 weeks) suit your lifestyle? What were some of the challenges, if any, that you faced?
- Overall, do you think that participating in 20 sessions of dTMS treatment benefited you in terms of your mood and well-being?
- Any other thoughts you would like to share with us regarding your experience?
- Would you recommend participating in this study to someone with a similar condition? Why or why not?

Verbal theoretical thematic analysis

We conducted a verbal thematic analysis of qualitative interview data following Braun and Clarke's (2006) theoretical thematic analysis model.¹ Verbal responses from the qualitative interview were exported into an Excel document and sentiments ("themes") were identified across participants (n=18). The themes were manually identified, assigned a code, and then tallied across the dataset. Importantly, the identification of recruitment-related facilitators and barriers was conducted retrospectively. The interview questions were not designed to assess recruitment outcomes but to evaluate the participants' experiences with the study. Considering the retrospective nature of this analysis, we felt that Braun and Clarke's theoretical thematic model was most appropriate to evaluate recruitment outcomes, as this form of analysis is guided by the research question of interest — in this case, recruitment outcomes. The themes are shown in Table S4 for data transparency.

Supplementary Results

Supplementary Table S2 Breakdown of referrals

Category	Reason for exclusion	No. of individuals
Referral Source: Community Engagement		
Participant uninterested	Not interested due to time commitment	1
Miscellaneous reasons for exclusion	No longer enrolling (max. number of women reached)	1
Referral breakdown	2 referrals – (2 uninterested + 2 after max. enrollment reached)	0 enrolled
Referral Source: Affiliated Inpatient & Outpatient Mental Health Clinics		
Participant uninterested	Not interested due to transportation challenges or long distance	2
	Not interested due to time commitment	1
	Could not commit due to ongoing health problems (stomach issues)	1
	Not interested (reason not provided)	2
Participant ineligible	Unstable medical condition (e.g., severe vertigo)	1
	History of acute neurological events (intracranial hemorrhage or stroke)	1
	Alzheimer's disease or dementia	1
	Bipolar disorder	1
	Borderline personality disorder	1
	Persistent depressive disorder	1
	Posttraumatic stress disorder	2
	Moderate-to-severe anxiety	1
	Substance dependence	2
	No active depressive episodes or subthreshold symptoms	1
	No diagnosis of major depressive disorder + No history of treatment resistance	1
	Moderate-to-severe anxiety + No active depressive episodes or subthreshold symptoms	1
	No active depressive episodes or subthreshold symptoms + Not 60 to 85 years old	1
	Bipolar disorder + Borderline personality disorder	1
	Not 60 to 85 years old	4
Referral breakdown	38 referrals – (20 excluded + 6 uninterested)	12 enrolled
Referral Source: Newspaper Advertising		
Participant uninterested	Not interested due to time commitment	1
Participant ineligible	Failed ECT trial	1
	Pacemaker	1
	Previous brain tumor	1
	Persistent depressive disorder	1
Referral breakdown	5 referrals – (4 excluded + 1 uninterested)	0 enrolled

Referral Source: Craigslist Advertising		
Participant uninterested	Reason not provided	1
Referral breakdown	1 referral – (1 uninterested)	0 enrolled
Referral Source: Facebook Advertising		
Participant uninterested	Did not return call/email	27
	Not interested due to transportation challenges/long distance	2
	Not interested due to time commitment	2
	No longer available	2
	No reason provided	1
	Not interested due to transportation challenges/long distance + time commitment	2
Miscellaneous reasons for exclusion	Duplicate record	13
	Incorrect phone number/email provided	2
	No longer enrolling (Maximum number of women reached for enrollment/final participant enrolled)	5
	Form filled out by mistake	1
	Partially complete form before November 1, 2023	4
	Note: Partially complete forms submitted prior to November 2023 were regarded as indicative of disinterest from potential participants. As such, no contact was made with these individuals due to the enrollment capacity being reached at that time.	
Participant ineligible	Living outside Greater Hamilton	4
	Unstable medical condition (e.g., cancer, tinnitus, multiple sclerosis, etc.)	3
	Chronic headaches or migraines (weekly or more)	5
	History of acute neurological events (intracranial hemorrhage or stroke)	4
	Failed ECT trial	3
	History of epilepsy or seizure	1
	Pacemaker	1
	Taking bupropion (Wellbutrin) 300 mg or more	1
	Alzheimer's disease or dementia	2
	Bipolar disorder	5
	Borderline personality disorder	2
	Obsessive-compulsive disorder	1
	Posttraumatic stress disorder	7
	Moderate-to-severe anxiety	1
	Substance dependence	2
	No diagnosis of major depressive disorder	6
	No active depressive episodes OR subthreshold symptoms	6
	No history of antidepressant treatment resistance	2
	Unstable medical condition + headaches/migraines	2
	History of acute neurological events + headaches/migraines	1
	Failed ECT trial + headaches/migraines	1
	Substance dependence + No diagnosis of major depressive disorder	1
	No active depressive episodes OR subthreshold symptoms + No history of treatment resistance +	1

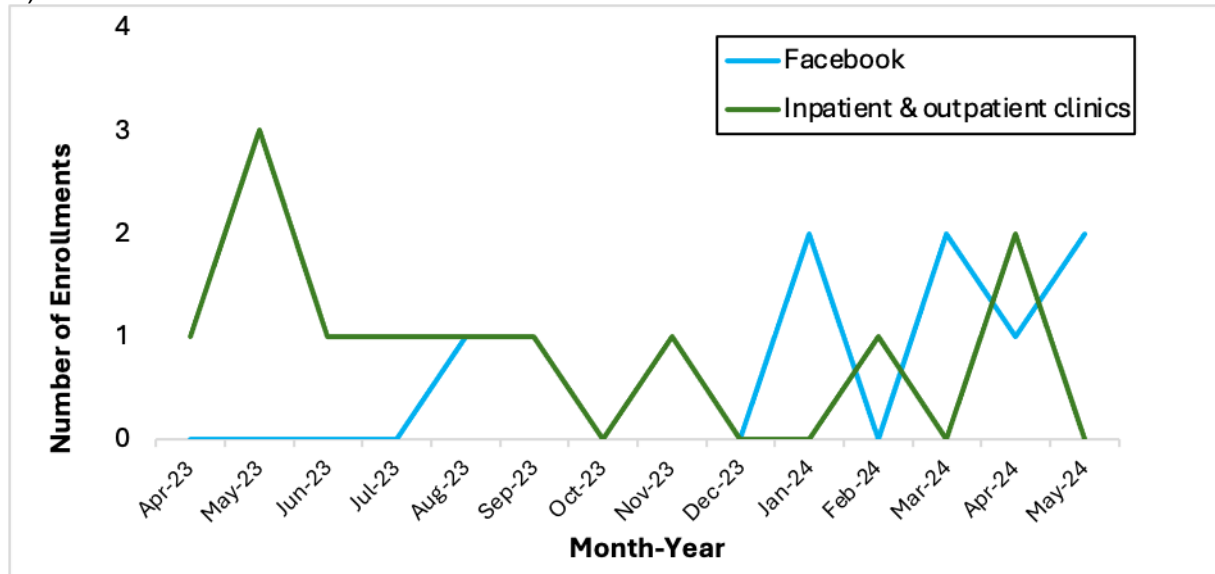
<http://doi.org/10.47626/1516-4446-2025-4168>

Enrollment cost and recruitment effectiveness in a deep transcranial magnetic stimulation clinical trial for older adults with depression: a mixed-methods analysis of recruitment strategies, facilitators, and barriers – Di Passa AM et al.

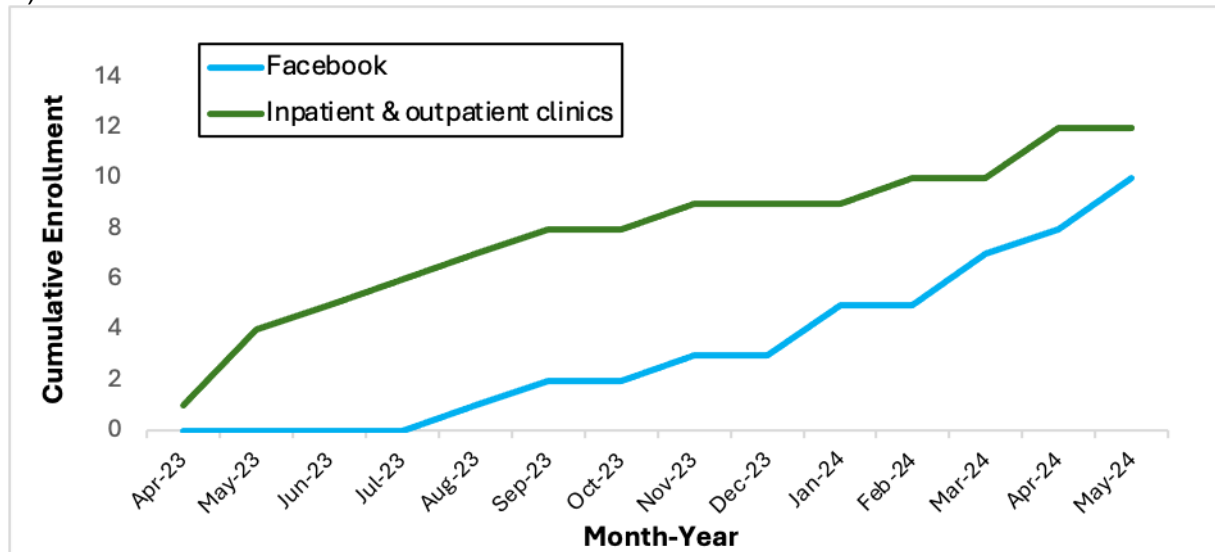
	Substance dependence	
	Moderate-to-severe anxiety + No diagnosis of major depressive disorder	1
	Moderate-to-severe anxiety + No history of treatment resistance	1
	Failed ECT trial + bipolar disorder + posttraumatic stress disorder	1
	Not 60 to 85 years old	2
Referral breakdown	138 referrals - 36 (uninterested) - 25 (miscellaneous reasons for exclusion) - 67 (ineligible)	10 enrolled
Referral Source: Google Advertising		
Participant ineligible	Not 60 to 85 years old	1
Referral breakdown	1 referral - 1 ineligible	0 enrolled
Total enrollments		12
No referrals were obtained from Google advertising or community engagement methods.		

Supplementary Figure S2 Enrollment over time

A)



B)



(A) Enrollment per month by recruitment strategy. Please note only two recruitment methods resulted in participant enrollment: Facebook and inpatient/outpatient clinics. **(B) Cumulative enrollment per month by recruitment strategy.** Facebook and inpatient/outpatient clinics resulted in 10 and 12 enrolled participants, respectively, over a 14-month period. In total, 22 participants were enrolled in the study. Recruitment in inpatient/outpatient clinics began in April 2023, whereas Facebook recruitment began in July 2023. Both recruitment strategies were discontinued when the recruitment phase concluded (May 2024)

Supplementary Table S3 Facebook advertising costs

Ad start date	Ad end date	Money spent (CAD)
Jul 27, 2023	August 3, 2023	51.67
Oct 23, 2023	Oct 30, 2023	83.98
Nov 21, 2023	Nov 28, 2023	181.98
Jan 9, 2024	Jan 16, 2024	181.99
Jan 18, 2024	Jan 25, 2024	69.95
Jan 26, 2024	Feb 2, 2024	181.97
Jan 26, 2024	Feb 2, 2024	83.91
Feb 5, 2024	Feb 12, 2024	181.93
Feb 12, 2024	Feb 19, 2024	181.96
Feb 23, 2024	Mar 1, 2024	181.92
Mar 5, 2024	Mar 12, 2024	182.39
Mar 12, 2024	Mar 19, 2024	84.31
Mar 25, 2024	Apr 1, 2024	83.99
Apr 2, 2024	Apr 9, 2024	265.97
Apr 9, 2024	Apr 16, 2024	167.99
Apr 17, 2024	Apr 24, 2024	167.97
Apr 29, 2024	May 6, 2024	86.47
TOTAL		CAD 2,420.35

Supplementary Table S4 Potential facilitators and barriers to recruitment

Theme identified across participants (n=18)	Frequency of theme	% of participants reporting theme
Facilitators		
Perceived social support and positivity from research staff	16	88.89
Positive/rewarding/worthwhile experience	14	77.78
Flexible scheduling/accommodation	8	44.44
Promoting autonomy/self-reflection/self-esteem	3	16.67
Transportation coverage and/or parking vouchers	3	16.67
Incorporating a daily routine/structure	3	16.67
Making positive impact participating in research	2	11.11
Monetary incentives (i.e., gift cards)	2	11.11
Receiving support from loved ones	2	11.11
Abstaining from maladaptive habits during treatment	1	5.56
Barriers		
Significant time commitment	6	33.33
Accessibility challenges (e.g., entering & exiting research facility)	3	16.67
Far distance/long commute to research center	2	11.11
Hesitant to enroll in study and/or negative expectations	2	11.11
Daily sessions felt overly routine/monotonous	1	5.56
Not a replacement for medical care	1	5.56