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Nature prescriptions for adolescent mental health: a feasibility study

Submission date	Recruitment status	[X] Prospectively registered
23/10/2025	Not yet recruiting	[ ] Protocol
Registration date	Overall study status	[ ] Statistical analysis plan
03/11/2025	Ongoing	[ ] Results
Last Edited	Condition category	[ ] Individual participant data
03/11/2025	Mental and Behavioural Disorders	[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Mental health challenges affect many Canadian adolescents aged 10 to 18 years, yet few receive adequate treatment. Nature prescriptions (Nature Rx), written prescriptions to connect with nature to support health (including adult mental health), show promise, but little is known about their benefits for adolescent mental health and well-being. This study will explore the feasibility of Nature Rx for adolescents at CH-LHSC and examine their effects on mental health and wellness.

Who can participate?
Adolescents living with depression aged 10-18 years accessing outpatient services at Children's Hospital, London Health Sciences Center (CH-LHSC) can participate in the quantitative and qualitative components of the study. Caregivers and healthcare providers of these adolescents may also participate.

What does the study involve?
Adolescent participants will receive a Nature Prescription, including a conversation about nature’s benefits and the specific activities prescribed. They will receive a printed prescription, a pamphlet, videos about nature's benefits, and a toolkit with sensory items and activities. A 6-week follow-up “nudge” will be offered by a research assistant. Surveys will be conducted before the prescription and again 3 and 6 months later. Interviews will be conducted within 1 week of the prescription and again 3 and 6 months later. Caregivers and HCPs of these adolescents will participate in qualitative interviews about their perspectives and experiences of Nature Rx for adolescents.

What are the possible benefits and risks of participating?
Participants may benefit from the Nature Prescription intervention by developing tools and strategies to support their health and wellbeing. However, it is also possible that they may not receive these benefits.
Adolescents may feel uncomfortable or upset when answering questions about their mental health and wellbeing or when discussing personal experiences during interviews. Some personal information will be collected during the study. While every effort will be made to keep this information safe and confidential, there is a small risk that data could be accidentally shared. If a

privacy breach occurs, the Health Sciences Research Ethics Board (HSREB) and London Health Sciences Centre will be notified within 48 hours, and institutional procedures will be followed. There may be risks in taking part in a nature prescription. Safety risks and considerations will be discussed with each adolescent and their care team. Prescribers will also follow common safety guidelines outlined in the prescribing resources to ensure the wellbeing of adolescent participants.

Where is the study run from?
The study is run from the Children's Hospital, London Health Sciences Centre (CH-LHSC) in London, Ontario. The principal investigators of this study are at Western University and CH-LHSC.

When is the study starting and how long is it expected to run for?
March 2025 to December 2026

Who is funding the study?
The Children's Health Research Institute (CHRI) (UK)

Who is the main contact?
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Public, Scientific, Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
Nature Rx for adolescent mental health: a feasibility study

Study objectives
Feasibility/Objective 1 (Primary Objective):
To examine the feasibility of Nature Rx as a mental health intervention to support adolescents (aged 10-18 years).

Mental Health/Objective 2:
To generate preliminary evidence on the effectiveness of Nature Rx for improving adolescent mental health outcomes (depression, anxiety- PHQ-9: Nine-symptom checklist, Generalized Anxiety Disorder 7-item scale).

Wellbeing/Objective 3:
To generate preliminary evidence on the effectiveness of Nature Rx on adolescent well-being and additional health-related measures (i.e., BMI, hemoglobin A1C, heart rate variability; survey measures of Acceptability of Intervention Measure, Intervention Appropriateness Measure, and Feasibility of Intervention Measure, Adolescent Wellbeing, Child and Youth Resilience Measure-Revised, The Hogg Eco-Anxiety Scale, Brief Screener for Tobacco, Alcohol, and other Drugs, Pediatric ACEs and Related Life Events Screener, HOPE Scale-Short Form, Generalized Self-Efficacy Scale, Mindful Self-Care Scale, Self-Compassion Scale Short Form, Child and Adolescent Mindfulness Measure, The Social Connectedness Scale, Youth Quality of Life Scale, Connectedness to Nature Scale (Children's Version).

Ethics approval required
Ethics approval required

Ethics approval(s)

submitted 04/03/2025, Western University Health Sciences Research Ethics Board (HSREB) (Western Research Room 5150, Support Services Building Western University, London, N6G 1G9, Canada; +1 (0)519 661 3036; ethics@uwo.ca), ref: 126829

Study design
Mixed-methods interventional feasibility study

Primary study design
Interventional

Study type(s)
Quality of life, Other

Health condition(s) or problem(s) studied
Adolescent mental health outcomes (depression, anxiety), adolescent well-being, and additional health-related measures

Interventions
Participants will be screened for moderate depression (based on the PHQ-9) at baseline survey. Following enrolment and the baseline survey, participants will receive a Nature Rx in an individual guided conversation with their HCP. Patient participants will receive a nature prescription from their healthcare provider (a formal plan for connecting nature). This Nature Rx conversation will include: the health and well-being benefits of connecting with nature, and a tailored discussion about the frequency, location and activities of their prescription, based on individual interests, needs, health status and geographical environment/access. HCPs will receive a Nature Prescribing toolkit, containing items such as a pamphlet to provide to patients in the intervention, a Nature Rx script and template, and Nature Rx case studies. Alongside the conversation, participants will receive (1) their printed Nature Rx Script, including the details above; (2) written (online, printed handout) resources summarizing the evidence on the health benefits of nature, which include a QR code link to three brief video summaries (i. The benefits of nature; ii. What is a nature Rx?; iii. Nature Rx 'how to'); (3) an Adolescent Nature Rx Sensory toolkit). Sensory toolkit items include a Nature journal (including somatic and embodied prompts, colouring activities and a Nature Rx logbook) with nature-based mindfulness activities, and a small indoor plant (optional, real or artificial - sight and touch), QR code nature playlist, a scent package.

Intervention Type
Behavioural

Primary outcome(s)
The acceptability and feasibility of Nature Rx as an adolescent (aged 10-18 years) mental health intervention, measured using:
1. Enrolment, recorded as the number of eligible participants who consent to participate at baseline
2. HCP completion: the number of patients who healthcare providers are able to prescribe nature to and follow-up with, measured at baseline and follow-up at 3 and 6 months
3. Recruitment rate recorded as the number of eligible participants who consent to participate who remain in the study until the end of follow up at 6 months
4. Adherence to Nature Rx (≥75%) assessed using the number of participants who consent to participate who adhere to their nature prescription at 3- and 6-month follow-ups, and RE-AIM

(reach, effectiveness, adoption, implementation, and maintenance) measured at 3 and 6 months
5. The researchers will qualitatively explore acceptability, barriers and facilitators using in-depth semi-structured interviews (adolescents, caregivers, healthcare provider), photo elicitation and narrative interviewing methods (adolescents). Adolescents will be interviewed at three timepoints (T1 - baseline, T2, T3). Caregiver and healthcare provider interviews will happen at one timepoint (T3).

Key secondary outcome(s))

Preliminary evidence on the effectiveness of Nature Rx for improving adolescent mental health outcomes (depression, anxiety) and wellbeing outcomes:
1. Depression measured using the Patient Health Questionnaire for Adolescents (PHQ-9) at T1, T2 and T3 (baseline, 3 months, 6 months).
2. Anxiety measured using the Severity Measure for Generalized Anxiety Disorder for Children 11-17 at T1, T2 and T3 (baseline, 3 months, 6 months).
3. Wellbeing measured using the Adolescent Wellbeing Scale for Young People Aged 11 to 16 at T1, T2 and T3 (baseline, 3 months, 6 months).
4. Quality of life measured using the Youth Quality of Life Scale at T1, T2 and T3 (baseline, 3 months, 6 months).
5. Child and youth resilience measured using the Child & Youth Resilience Measure-Revised (CYRM-R)at T1, T2 and T3 (baseline, 3 months, 6 months).
6. Connectedness to nature measured using the connectedness to nature scale at T1, T2 and T3 (baseline, 3 months, 6 months).
7. Ecodistress measured using the Hogg Eco-Anxiety Scale (HEAS-13) at T1, T2 and T3 (baseline, 3 months, 6 months).
8. Substance use measured using a brief screener for tobacco, alcohol, and other drugs measure at T1, T2 and T3 (baseline, 3 months, 6 months).
9. Paediatric ACEs and related life events measured using PEARLS T1, T2 and T3 (baseline, 3 months, 6 months).
10. Hope measured using the HOPE Scale-Short Form T1, T2 and T3 (baseline, 3 months, 6 months).
11. Self-efficacy measured using the Generalised Self-efficacy Scale at T1, T2 and T3 (baseline, 3 months, 6 months).
12. Mindful self-care measured using the Mindful Self-Care Scale atT1, T2 and T3 (baseline, 3 months, 6 months).
13. Self-compassion measured using the Self-Compassion Scale Short Form 0 (SCS-SF) atT1, T2 and T3 (baseline, 3 months, 6 months).
14. Mindfulness measured using the Child and Adolescent Mindfulness Measure (CAMM) at T1, T2 and T3 (baseline, 3 months, 6 months).
15. Social connectedness measured using the Social Connectedness Scale at T1, T2 and T3 (baseline, 3 months, 6 months).
16. Nature connectedness measured using the Connectedness to Nature Scale: Children's Version at T1, T2 and T3 (baseline, 3 months, 6 months).
17. Sleep measured using the Adolescent Sleep Wake Scale (ASWS)- short and sleep pattern /duration items from the Children’s Report of Sleep Patterns (CRSP) at T1, T2 and T3 (baseline, 3 months, 6 months).
18. Pro-environmental behaviours measured using the Social Pro-Environmental Behaviors Scale for Adolescents (s-PEBS-A) at T1, T2 and T3 (baseline, 3 months, 6 months).

Completion date

31/12/2026

Eligibility

Key inclusion criteria
Adolescent eligibility:
Inclusion criteria for quantitative survey include:
1. At recruitment stage, a list of adolescents with a depression diagnosis based on PHQ-9A with HCP at CH-LHSC OR depression diagnosis based on clinic procedures will be provided to the study team
2. Screen for depression (using PHQ-9A, with a validated cutoff score of 10) on quantitative survey by study team
3. Aged 10-18 years
4. Ability to participate in English
5. Are able to provide informed consent (as determined by the recommending HCP)

Inclusion criteria for adolescent qualitative patients include:
1. Adolescent patients who have participated in the quantitative survey and intervention (i.e., inclusion criteria as above apply)
2. Informed patient consent

Healthcare providers:
Inclusion criteria include:
1. Health provider at CH-LHSC
2. Prescribed nature to an adolescent participant
3. Ability to participate in English
4. Informed consent

Caregivers:
Inclusion criteria include:
1. A caregiver of a patient who participated in the intervention
2. Ability to participate in English
3. Provide informed consent to participate
4. Patient (their child) provided consent for their participation

Participant type(s)
Health professional, Patient, Other

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
10 years

Upper age limit
18 years

Sex
All

Key exclusion criteria
Adolescent eligibility:
Exclusion criteria for quantitative survey:
1. Did not screen for depression (using PHQ-9A, with a validated cutoff score of 10) by a HCP at CH-LHSC AND has not received depression diagnosis by a CH-LHSC HCP
2. Are not between the ages of 10-18 years
3. Are unable to participate in English
4. Informed patient consent is not obtained

Exclusion criteria for qualitative patients:
1. Adolescent patients did not in the quantitative survey and intervention (i.e., inclusion criteria as above apply)
2. Informed patient consent not obtained

Healthcare Providers:
Exclusion criteria include:
1. Is not a health provider at CH-LHSC
2. Did not prescribe nature to an adolescent participant in this study
3. Are unable to participate in English
4. Informed consent is not obtained

Caregivers:
Exclusion criteria include:
1. Not a caregiver of a patient who participated in the intervention
2. Are unable to participate in English
3. Do not provide informed consent to participate
4. Patient (their child) did not provide consent for their participation

Date of first enrolment
01/12/2025

Date of final enrolment
01/09/2026

Locations

Countries of recruitment
Canada

Study participating centre
Children's Hospital, London Health Sciences Centre
800 Commissioners Rd E
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N6A 5W9

Sponsor information

Organisation
London Health Sciences Centre Research Institute

ROR
https://ror.org/04m7cgp86

Funder(s)

Funder type
Research organisation

Funder Name
Children's Health Research Institute

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during the current study will be stored in a non-publicly available repository at Western University. De-identified data may be accessed and analysed by members of the project team. Consent from participants will not be sought for sharing raw data publicly. Data will not be made available, given the potential for unintentional participant identification, and the possibility of data being engaged without adequate contextualising information.

IPD sharing plan summary
Stored in non-publicly available repository