International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Does Physical Activity-Based Intervention decrease repetitive negative thinking? A Systematic Review

INPLASY202440095

doi: 10.37766/inplasy2024.4.0095

Received: 23 April 2024

Published: 23 April 2024

Corresponding author:
Shimeng Wang

wangsm@ntu.edu.cn

Author Affiliation:
Nantong University.

Wang, SM; Lu, MY; Dong, XX; Xu,YF.

ADMINISTRATIVE INFORMATION

Support - This study was supported by the Humanities and Social Science Research Youth Fund, the Ministry of Education of China(23YJC890039).

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202440095

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 23 April 2024 and was last updated on 23 April 2024.

INTRODUCTION

Review question / Objective Repetitive negative thinking (RNT), characterized by its inefficacy and difficulty to control, along with its tendency for repetitive contemplation of negative events, is considered a key factor in exacerbating depression and anxiety. A wealth of research evidence suggests that physical activity-based interventions have a positive effect on alleviating RNT. However, some studies still exhibit heterogeneity in their outcomes and conclusions. Therefore, to determine whether physical activity-based interventions have a positive impact on RNT, this study employed a systematic review methodology to comprehensively review relevant research. The aim was to utilize existing studies to address the aforementioned questions and provide guidance for future research and practice.

Condition being studied Depression and anxiety are common mental disorders characterized by high prevalence, recurrence, suicide rates, and disability rates, posing significant public health challenges worldwide (World Health Organization, 2001). According to the latest data from the Global Burden of Disease: Results Tool (https://vizhub.healthdata.org/gbd-results/), there are 280 million people globally suffering from depression and 301 million people suffering from anxiety. Repetitive Negative Thinking (RNT), characterized by its ineffective and uncontrollable nature, along with its tendency to ruminate on negative events, is considered one of the primary contributors to the onset of depression and anxiety (Spinhoven, van Hemert & Penninx, 2018; Bell et al., 2023). RNT refers to the repetitive engagement in negative thoughts about situations, emotions, and events (Ehring & Watkins, 2008), primarily involving rumination and worry (Spinhoven et al., 2015).

Ehring & Watkins (2008) proposed that both rumination and worry are repetitive, uncontrollable, and negative thought patterns with a high degree of overlap. The key difference lies in rumination's emphasis on repetitive thinking and over-analysis of past negative experiences (Nolen-Hoeksema, 1991), which is more closely associated with depression (McLaughlin & Nolen-Hoeksema, 2011), while worry focuses on excessive concern and anxiety about future negative events (Borkovec, 1994), which is more closely related to anxiety disorders (Newman et al., 2013). Extensive evidence suggests that RNT predicts the onset and maintenance of depression and anxiety (Spinhoven et al., 2015). Therefore, reducing RNT holds clinical significance for improving outcomes in depression and anxiety. Currently, effectively reducing RNT has become an important target for treating depression and anxiety (Topper, Emmelkamp, & Ehring, 2010; McEvoy et al., 2018; Ehring & Watkins, 2008).

METHODS

Participant or population Placebo or conventional treatment.

Intervention The experimental group in controlled trials received interventions based solely on physical activity (physical activity programs are not limited)Physical Activity-Based Intervention.

Comparator The control group received standard interventions or no intervention.

Study designs to be included Randomized controlled trial or a non-randomized controlled trial.

Eligibility criteria The study selects English-language literature published in peer-reviewed journals. The research type must be either a randomized controlled trial (RCT) or a non-randomized controlled trial that reports sufficient statistical details (such as means, standard deviations, sample sizes, etc.). Literature reviews, case reports, conference abstracts, study protocols, duplicate publications, studies with inaccessible full texts or unavailable data extraction, as well as studies without access to original data, will be excluded. Among the selected studies, the experimental group in controlled trials received interventions based solely on physical activity (physical activity programs are not limited), while the control group received standard interventions or no intervention.The research findings must be assessed using validated instruments and report indices measuring RNT (rumination, worry, perseverative thinking) outcomes.To minimize the possibility of omission or misjudgment, two researchers independently conducted literature screening, followed by cross-validation. In case of discrepancies during the screening process, they were resolved through discussion; if consensus could not be reached, a third party made the final adjudication. Due to the large number of literature items to be screened, multiple rounds of screening will be conducted, supplemented by relevant systematic reviews or meta-analyses to avoid literature omissions. The included studies are managed using EndNote 21 software (https://endnote.com/product-details/). After removing duplicate studies, titles and abstracts are reviewed, and preliminary screening is conducted based on inclusion and exclusion criteria. Subsequently, relevant full-text articles are obtained and thoroughly reviewed. The remaining studies from the initial screening undergo a second round of screening to identify experimental studies that can be included in this research. The research will utilize standardized forms for data recording. Similarly, two researchers will independently extract data and cross-check the extracted data. In case of discrepancies, a third party will be involved to resolve them. The extracted data will encompass various aspects of the included studies. Firstly, it will capture the fundamental details of each study, such as the title, authors, and publication date. Secondly, it will compile basic information about the study participants, including their average age and the sample sizes of both the experimental and control groups. Additionally, it will document the intervention measures undertaken, specifying the interventions' frequency, timing, and duration. Moreover, it will detail the control measures employed, including their frequency and timing. Furthermore, the data extraction process will include information about the content and measurement tools of the indicators used to assess RNT. Finally, the study design will be meticulously documented, with a focus on key elements evaluating bias risk, such as randomized controlled trial design or quasi-experimental design, etc.

Information sources Using PubMed, Web of Science, Cochrane Library, and APA PsycNET databases, we conducted literature searches. Based on the objectives of the literature search and the characteristics of each database, we reviewed the literature extensively and performed multiple searches to determine the search strategy, aiming to comprehensively retrieve relevant literature. Additionally, to avoid overlooking relevant studies, two researchers independently conducted searches according to pre-defined

inclusion and exclusion criteria. In cases of disagreement during the study selection process, further discussion was conducted to reach a consensus. Following the PICOS principles (Eriksen & Frandsen, 2018), the search focused on the keywords "physical activity," "repetitive negative thinking," "perseverative thinking," "worry," and "rumination." The search covered the period from the inception of each database to October 2023. For example, the search strategy in Web of Science was formulated as follows: TS=(physical activity* OR exercise* OR acute exercise* OR exercise training* OR aerobic exercise* OR exercise intervention*) AND TS=(repetitive negative thinking* OR Perseverative thinking* OR rumination* OR worry*).

Main outcome(s) These include the first author's name, country of publication, publication year, participant characteristics, study design, sample size, intervention protocol, outcome description, outcome measures, measurement tools, and quality assessment score. The included studies were conducted in the United States, the Netherlands, Ireland, Canada, and Belgium, spanning the years 2005 to 2022. Among them, 11 studies employed a RCT design (Basso et al., 2022; de Bruin, 2016; Gordon et al., 2020; Gordon et al., 2021; Herring et al., 2012; Herring et al., 2017; Herring et al., 2018; La Rocque et al., 2021; McDowell et al., 2016; Schuver et al., 2016; van Aalst et al., 2021), 2 studies utilized quasi-experimental designs (Alderman et al., 2016; Craft, 2005), and 1 study employed a pre-post experimental design (Shors et al., 2018). The sample sizes of the included studies ranged from 17 to 80, totaling 594 participants across all studies. The participants primarily consisted of healthy individuals, those with depression, generalized anxiety disorder, and individuals experiencing stress, with ages ranging from approximately 18 to 59 years. Interventions included two types: single physical activity interventions, comprising aerobic exercise and resistance training, and combined interventions involving both physical activity and psychological training. All studies reported intervention dosages, with single-session intervention durations categorized into two types: the number of sets required for resistance training and durations ranging from a minimum of 30 minutes to a maximum of 80 minutes for other interventions. Intervention frequencies varied from once a week to seven times a week. The intervention durations ranged from single-session interventions to interventions lasting up to 12 weeks. All studies utilized the Ruminative Response Scale(RRS) and the Penn State Worry Questionnaire(PSWQ) to assess RNT, with 6 studies reporting rumination and 8 studies reporting worry.14 studies were included, with 6 studies reporting rumination and 8 studies reportingworry.

Quality assessment / Risk of bias analysis The methodological quality of the included studies was assessed using the Physiotherapy Evidence Database (PEDro), which consists of 11 evaluation criteria. Each criterion is scored 1 point for compliance with the standard, while 0 points are assigned for criteria that are not applicable or not met. Studies with a total score ranging from 0 to 3 points are classified as low-quality, 4 to 7 points as medium-quality, and 8 to 11 points as high-quality. Evaluation was independently conducted by two researchers, with any disagreements resolved through discussion or adjudicated by a third party.

Strategy of data synthesis Due to qualitative analysis, there is no strategy of data synthesis.

Subgroup analysis No subgroup analysis.

Sensitivity analysis No sensitivity analysis.

Language restriction English only.

Country(ies) involved China, South Korea, Poland.

Keywords physical activity, repetitive negative thinking, rumination, worry, systematic review.

Contributions of each author

Author 1 - Shimeng Wang - Author 1 drafted the manuscript.
Email: wangsm@ntu.edu.cn
Author 2 - Mingyang Lu - The author contributed to the development of the selection criteria, and the risk of bias assessment strategyThe author provided statistical expertise.
Email: mingyang@dankook.ac.kr
Author 3 - Xiaoxiao Dong - The author contributed to the development of the selection criteria, and the risk of bias assessment strategyThe author provided statistical expertise.
Email: xiaox_dong@163.com
Author 4 - Yifan Xu - The author read, provided feedback.
Email: yifan.xu@awf.gda.pl