

**Weekend warrior physical activity engagement and the risk of mental health conditions: A systematic review and narrative synthesis**

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**Supplementary material 2: MOOSE Checklist**

Item No.	Criteria	Reported (Yes/No)	Where it reported	How it addressed in the manuscript
<b>Reporting of Background</b>				
1	Problem definition	Yes	Introduction	Regular moderate-to-vigorous physical activity (MVPA) offers mental health benefits, with guidelines recommending 150 minutes weekly. However, many struggle to meet this standard. The weekend warrior (WW) approach, which involves reaching this activity level in one or two days, may lower the risk of mental health conditions, but evidence is limited.
2	Hypothesis statement	Yes	Introduction	This study reviews if the WW pattern reduces risks of mental disorders compared to regular physical activity (RPA) and inactivity.
3	Description of Study Outcome(s)	Yes	Introduction and Supplementary Material 3	Mental health conditions
4	Type of exposure or intervention used	Yes	Introduction and Supplementary Material 3	Weekend warrior physical activity pattern
5	Type of study design used	Yes	Results (3.2. Study characteristics)	Observational studies
6	Study population	Yes	Introduction and Supplementary Material 3	Adult general populations with assessment of physical activity pattern and psychological assessments
	<b>Reporting of Search Strategy</b>			
7	Qualifications of researchers (eg, librarians and investigators)	Yes	Title Page	Arian Daneshpour, Joseph Firth, Brendon Stubbs
8	Search strategy, including time period included in the synthesis and keywords	Yes	Methods (2.2. Search strategy) and Supplementary Material 3	Time period: from inception to October 30, 2025 The detailed search strategy can be found in Supplementary Material 3
9	Effort to include all available studies, including contact with authors	Yes	Methods (2.3. Eligibility criteria)	In order to identify possible eligible studies, the first author (A.D.) independently reviewed the titles and/or abstracts of the studies, subsequently retrieved the full text of the studies, and, if the full text was unavailable, contacted the corresponding author. The second author (J.F.) independently assessed the studies to determine their eligibility. Disagreements between the two reviewers were initially resolved through discussion, and subsequently by the third author (B.S.).
10	Databases and registries searched	Yes	Methods (2.2. Search strategy) and	On October 30, 2025, a comprehensive systematic search was conducted on PubMed, Embase, Scopus, Web of Science, PsycINFO, EBSCOhost (MEDLINE, SPORTDiscus, CINAHL) using keywords or terms related

			Supplementar y Material 3	to the exposure ("weekend warrior") and outcome ("mental health"). Detailed search strategies are displayed in Supplementary Material 3.
11	Search software used, name and version, including special features used (e.g., explosion)	No	-	-
12	Use of hand searching (e.g., reference lists of obtained articles)	Yes	Methods (2.2. Search strategy)	The reference list and citations of all articles included in the study were screened to identify potential eligible articles. Ultimately, the manual search in Google Scholar was also implemented to identify any overlooked studies.
13	List of citations located and those excluded, including justification	Yes	Results (3.1. Study Selection), Figure 1	The initial search in online databases resulted in a total of 105 studies, with the following distribution: 14 in PubMed, 19 in Embase, 35 in Scopus, 16 in Web of Science, 5 in PsycINFO, and 16 in EBSCOhost (MEDLINE, SPORTDiscus, CINAHL). Additionally, 50 studies were identified after searching grey literature. After removing duplicates and animal studies, 10 studies remained. After removing irrelevant studies from grey literature, 2 studies were retained. After reviewing the titles and abstracts, 2 studies were excluded based on our exclusion criteria. The full papers were sought, from the 10 remaining studies and 1 study did not meet the eligibility criteria for inclusion in the current study. Investigating the reference lists of the included studies did not yield any additional studies for inclusion. Following an update on April 17 2025, 3 studies, and on October 30, 1 additional study, were identified.
14	Method for addressing articles published in languages other than English	Yes	Methods (2.3. Eligibility criteria)	Only peer-reviewed original English-language studies that assess the impact of WW PA pattern on mental health measures in human subjects were included in this systematic review.
15	Method of handling abstracts and unpublished studies	Yes	Methods (2.2. Search strategy)	To identify grey literature, the unpublished preprints were explored in medRxiv, bioRxiv, and Preprints with The Lancet. The resources of ProQuest, EBSCO Open Dissertations, and open-access theses and dissertations (OATD) were inspected for unpublished theses and dissertations. Additionally, for missing clinical trials, a comprehensive search was conducted on ClinicalTrials.gov. Ultimately, a manual search in Google Search and Google Scholar was implemented to identify any additional grey literature.
16	Description of any contact with authors	Yes	Methods (2.3. Eligibility criteria)	In order to identify possible eligible studies, the first author (A.D.) independently reviewed the title and/or abstract of the studies, and subsequently retrieved the full-text of the studies and if the full text was not available, contacted the corresponding author. The studies were independently assessed by the second author (J.F.) to determine their eligibility. Disagreements between the two reviewers were initially resolved through discussion, and subsequently by the third author (B.S.).
	<b>Reporting of Methods</b>			

17	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Yes	Methods (2.3. Eligibility criteria) and Supplementary Material 3	It has been described in details in the eligibility criteria in the Methods section and Supplementary Material 3.
18	Rationale for the selection and coding of data (eg, sound clinical principles or convenience)	Yes	Methods (2.5. Data Extraction)	The data extracted from each of the studies were pertinent to the population characteristics, study design, exposure, and outcome.
19	Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability)	Yes	Methods (2.5. Data Extraction)	Initially, the first author (A.D.) extracted pertinent data from eligible studies, and the second author (J.F.) independently assessed the extracted data. The third author (B.S) resolved the discrepancies.
20	Assessment of confounding (e.g., comparability of cases and controls in studies where appropriate)	Yes	Results (3.4.2 Stratified analyses by moderators)	The results of the stratified analyses by moderators were narratively synthesized to assess the effect of moderators on the relationship between weekend warrior physical activity and mental health conditions.
	<b>Reporting Criteria</b>	<b>Reported (Yes/No)</b>		<b>How it addressed in the manuscript</b>
21	Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Yes	Methods (2.5. Quality assessment), supplementary Material 4	Two authors (A.D. and J.F.) independently evaluated the studies' quality and risk of bias (ROB). In case of a disagreement regarding the scoring, the authors engaged in further discussion until they reached a consensus. If necessary, the third author (B.S.) was consulted. The quality of the studies and risk of bias (ROB) were first evaluated using the Newcastle-Ottawa Scale (NOS) for longitudinal studies and its modified version for cross-sectional studies. The NOS assesses the quality of studies and the risk of bias by utilizing three categories: participant selection, comparability, and outcomes. The items in each category are detailed in Supplementary Material 4. A study may receive a maximum of one point for each item in the selection and outcome categories, and a maximum of two points may be given for comparability. The NOS has a maximum possible score of 9. Cross-sectional studies can achieve a maximum of 7 stars, while longitudinal studies may reach up to 9 stars. In this regard, longitudinal studies were classified as low, moderate, and high quality based on scores of 0–3, 4–6, and 7–9. For cross-sectional studies, the scores of 0–2, 2–4, and 4–7 were categorized as low, moderate, and high quality, respectively (Sánchez-Sánchez, et al., 2024; Wells, et al., 2000). The studies of low quality were excluded from the current study.
22	Assessment of heterogeneity	No	NA	NA

23	Description of statistical methods (e.g. complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	No	NA	NA
24	Provision of appropriate tables and graphics	Yes	Table 1, 2, 3, and Figure 1	Table 1, 2, 3 and Figure 1
	<b>Reporting of Results</b>			
25	Table giving descriptive information for each study included	Yes	Table 1	Table 1
26	Results of sensitivity testing (e.g., subgroup analysis)	No	NA	NA
27	Indication of statistical uncertainty of findings	No	NA	NA
	<b>Reporting of Discussion</b>			
28	Quantitative assessment of bias (e.g. publication bias)	No	NA	NA
29	Justification for exclusion (e.g., exclusion of non-English-language citations)	Yes	Methods (2.3. Eligibility criteria)	Animal studies and studies focusing on other factors rather than mental health outcomes were excluded. The studies that considered mental health problems as a confounder were also excluded from this study.
30	Assessment of quality of included studies	Yes	Methods (2.5. Quality and Risk of Bias assessment) Results (3.3. Risk of bias in studies) and Supplementary Material 4	The quality of the studies and risk of bias (ROB) were evaluated using the Newcastle-Ottawa Scale (NOS) for longitudinal studies and its modified version for cross-sectional studies.
	<b>Reporting of Conclusions</b>			

31	Consideration of alternative explanations for observed results	Yes	Conclusions	The whole section of conclusions.
32	Generalization of the conclusions (i.e., appropriate for the data presented and within the domain of the literature review)	Yes	Conclusions	The whole section of conclusions.
33	Guidelines for future research	Yes	Future directions	Future directions to address the inadequacies were comprehensively discussed.
34	Disclosure of funding source	Yes	Funding	The authors did not receive any funding.