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Protective Correlation of Weekend Catch-up Sleep with Obesity: A systematic review and dose-response meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202610038

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 January 2026 and was last updated on 12 January 2026.

INTRODUCTION

Review question / Objective The aim of this systematic review and meta-analysis was to determine the association between weekend catch-up sleep (WCS) and obesity, and explored the dose-response effect between these two factors.

Condition being studied The protective effect of compensatory sleep on weight and obesity remains controversial. The aim of this systematic review and meta-analysis was to determine the association between weekend catch-up sleep (WCS) and obesity, and explored the dose-response effect between these two factors.

METHODS

Search strategy Two researchers (T.L. and X.W.) carried out the literature search with the aid of a qualified medical reference librarian (S.Y.). Four English-language databases (Web of Science, PubMed, Cochrane Central Register of Controlled Trials, and Embase) were searched to determine all potential studies related to the WCS published from database inception to December 1st, 2025. These search terms were utilized: WCS, weekend recovery sleep, sleep compensation, catch-up sleep, weekend sleep extension, sleep debt recovery, and sleep rebound.

Participant or population Population-based research works.

Intervention Weekend Catch-up Sleep.

Comparator No Weekend Catch-up Sleep.

Study designs to be included Cross-sectional or prospective research works and randomized controlled trials (RCTs).

Eligibility criteria Inclusion criteria were: (i) population-based research works; (ii) data from cross-sectional or prospective research works and randomized controlled trials (RCTs), directly and/or indirectly providing the outcome's relative risk, such as risk ratio (RR), hazard ratio (HR), and odds ratio (OR) values; (iii) studies on the association between WCS and obesity, with clinical outcomes including overweight, obesity, or other related indicators; (iv) a clear definition of WCS; and (v) clear details of the proposal, including design, research strategy, and process.

Information sources Four English-language databases (Web of Science, PubMed, Cochrane Central Register of Controlled Trials, andEmbase).

Main outcome(s) Association of WCS with obesity.

Additional outcome(s) Subgroup analysis and Dose-response relationship.

Quality assessment / Risk of bias analysis Two researchers assessed the bias's risk in the involved research works via the Agency for Healthcare Research and Quality (AHRQ) tool and cross-checked their evaluations.

Strategy of data synthesis Adjusted ORs and 95% confidence intervals (CI) extraction was conducted from all studies, and a meta-analysis was conducted to combine relative risks. Heterogeneity was evaluated via the I^2 statistic; the application of a fixed-effects model was conducted if $I^2 < 50\%$, and a random-effects model if $I^2 > 50\%$[16]. Subgroup analyses were conducted by gender, age, and WCS duration. Leave-one-out sensitivity analyses were conducted by eliminating single research work at a time to estimate robustness[17], and publication bias was estimated via funnel plots. Dose–response effects were examined via restricted cubic spline regression[18], with 4 knots at the 5th, 35th, 65th, and 95th percentiles of AF burden[19]. Nonlinear significance was tested by the second spline coefficient; if $P_{nonlinear} > 0.05$, a linear dose–response effect was considered significant[20, 21]. Meta-analysis was performed using R, and dose–response analyses were conducted with STATA (v15.0, College Station, USA).

Subgroup analysis Subgroup analyses were conducted by gender, age, and WCS duration.

Sensitivity analysis Leave-one-out sensitivity analyses were conducted by eliminating single research work at a time to estimate robustness[17], and publication bias was estimated via funnel plots.

Language restriction English.

Country(ies) involved China - Department of Clinical Psychology, Affiliated Hangzhou First People's Hospital, School of Medicine, Westlake University.

Keywords Weekend Catch-up Sleep, Obesity, Systematic review, Dose-response, Meta Analysis.

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