INPLASY PROTOCOL

To cite: Tong et al. A systematic review and meta-analysis of the impact of sleep duration on adiposity and components of energy balance. Inplasy protocol 202070073. doi: 10.37766/inplasy2020.7.0073

Received: 16 July 2020

Published: 16 July 2020

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Support: **NSFC**

Review Stage at time of this submission: **Preliminary searches.**

Conflicts of interest:
There is no conflict of interest between the authors of this study.

A systematic review and meta-analysis of the impact of sleep duration on adiposity and components of energy balance

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Review question / Objective: **PICOS: Participants: Obese people, people with sleep disorders interventions: differences in randomly assigned sleep durations (which could be increases or decreases from baseline levels) and/or behavioural interventions designed to achieve such alterations in sleep duration comparators: Unrestricted sleep time or blank control group outcomes: An outcome must be at least one of the following:weight, BMI, BMI percentile (for children), weight change,total body fat, waist circumference, food intake, physical activity, metabolic rate or appetite-related hormones(ghrelin, glucagon, leptin, insulin). Values must be measured (not self-reported) study design: We aimed to find experimental evidence that has tested this relationship between sleep duration and measures of body composition, food intake or biomarkers related to food intake.We conducted a systematic literature review using six databases throughout 16 July 2020. We sought reports of randomized controlled trials where sleep duration was manipulated and measured outcomes were body weight or other body composition metrics, food intake, and/or biomarkers related to eating.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 July 2020 and was last updated on 16 July 2020 (registration number INPLASY202070073).

INTRODUCTION

Review question / Objective: **PICOS: Participants: Obese people, people with sleep disorders interventions: differences in randomly assigned sleep durations (which could be increases or decreases from baseline levels) and/or behavioural interventions designed to achieve such alterations in sleep duration comparators: Unrestricted sleep time or blank control**

group outcomes: An outcome must be at least one of the following:weight, BMI, BMI percentile (for children), weight change,total body fat, waist circumference, food intake, physical activity, metabolic rate or appetite-related hormones(ghrelin, glucagon, leptin, insulin). Values must be measured (not self-reported) study design: We aimed to find experimental evidence that has tested this relationship between sleep duration and measures of body composition, food intake or biomarkers related to food intake.We conducted a systematic literature review using six databases throughout 16 July 2020. We sought reports of randomized controlled trials where sleep duration was manipulated and measured outcomes were body weight or other body composition metrics, food intake, and/or biomarkers related to eating.

Condition being studied: 1. In line with the laws of science and nature 2. With research 3. The conditions required in the research process are easier to meet 4. Have a feasible and scientific research plan 5. Have the equipment, site or environment to study the subject.

METHODS

Search strategy: Systematic review of the literature searched the following databases for available articles and dissertations throughout 16 July 2020: Cochrane, PubMed, Embase, CNKI, WanFang, WeiPu and Sinomed. We also obtained additional sources from the references of papers found in the initial search or colleagues.

Participant or population: Healthy people.

Intervention: Control sleep durations.

Comparator: The control group's measures are non-intervention.

Study designs to be included: Randomized controlled trials

Eligibility criteria: Inclusion criteria 1. Randomized control trials; 2. Humans; 3. Independent variables: differences in randomly assigned sleep durations (which could be increases or decreases from baseline levels) and/or behavioural interventions designed to achieve such alterations in sleep duration; 5. An outcome must be at least one of the following: weight, BMI, BMI percentile (for children), weight change,total body fat, waist circumference, food intake, physical activity, metabolic rate or appetite-related hormones(ghrelin, glucagon, leptin, insulin). Values must be measured (not self-reported); 6. Published on or before the search date of 16 July 2020; 7. Intervention or experimental manipulation period of at least 24 hours (h). Exclusion criteria We excluded studies with combined interventions where the unique effects of sleep duration on energy balance could not be separately evaluated. We also excluded studies of participants with serious illnesses other than obesity (e.g. metabolic syndrome, diabetes, cardiovascular disease), in-patient studies on persons with anxiety and/or depression; use of medications that effect body weight; bariatric surgery; organ transplant patients; persons with mobility impairment; current drug or alcohol dependence; surgical correction to increase sleep or reduce snoring; oral appliances for airway modification; use of other airway devices for sleep apnea (e.g. CPAP); and hormone therapy.

Information sources: Systematic review of the literature searched the following databases for available articles and dissertations throughout 16 July 2020: Cochrane Library, PubMed, Embase, CNKI, WanFang, WeiPu and Sinomed. We also obtained additional sources from the references of papers found in the initial search or colleagues.

Main outcome(s): body weight

Additional outcome(s): BMI, BMI percentile (for children), weight change,total body fat, waist circumference, food intake, physical activity, metabolic rate or appetite-related hormones(ghrelin, glucagon, leptin, insulin). Values must be measured (not self-reported).

Data management: EndNote, Review Manager, Grade.

Quality assessment / Risk of bias analysis: Evaluating the areas of potential risk of bias according to the Cochrane Handbook guidelines .The risk of bias summary figures were generated with the Review Manager software. According to Criteria for judging risk of bias in the 'Risk of bias' assessment tool.

Strategy of data synthesis: We used Review Manager and Microsoft®Excel to calculate the standardized mean differences between treatment and control groups when sample sizes, means and SEs/SDs were reported, or if exact P values were given between groups for change values within groups. Data were used to generate the forest plots for each comparison using Review Manager. Accurate appraisal of included documents, meta-analysis of documents with less heterogeneity, and subgroup analysis of documents with greater heterogeneity. If the heterogeneity cannot be reduced, consider excluding the document and only perform descriptive analysis.

Subgroup analysis: Refer to the specific actual situation, if necessary.

Sensibility analysis: Refer to the specific actual situation, if necessary.

Language: English.

Country(ies) involved: China.

Other relevant information: No.

Keywords: Obesity, sleep, energy expenditure, weight.

Contributions of each author:
Author 1 - Li Tong - Author 1 drafted the manuscript.
Author 2 - Shi Xiaoshuang - The author provided statistical expertise.
Author 3 - Teng Rufeng - The author assisted in the literature retrieval and collation.
Author 4 - Liang Fengxia - The author read, provided feedback and approved the final manuscript.
Author 5 - Chen Rui - The author read, provided feedback and approved the final manuscript.
Author 6 - Jing Xianghong - The author read, provided feedback and approved the final manuscript.
Author 7 - Su Yangshuai - The author provided statistical expertise.
Author 8 - Wang Hua - The author read, provided feedback and approved the final manuscript.
Author 9 - Huang Qi - The author provided statistical expertise.
Author 10 - Song Yanjuan - The author assisted in the literature retrieval and collation.