

INPLASY PROTOCOL

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None declared.

The clinical evidence of effectiveness and safety of massage chair: a scoping review

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Review question / Objective: To evaluate current clinical evidence status of massage chair and to present evidence map for future research implication.

Background: A massage chair is a furniture-type device such as a sofa or bed which provides automated massage using installed rollers and airbags. Although the market is growing and the number of users is increasing, its clinical evidence of the benefit and harm has not been clearly established yet. Because it is accepted like a furniture not a medical devices, its use is not controlled by medical personnel like other medical devices, so there is a need to pay attention to safety issues and effectiveness in terms of individual health promotion. This scoping review will assess the current evidence status of massage chair and present clinical research agenda in future.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 05 February 2023 and was last updated on 05 February 2023 (registration number INPLASY202320021).

INTRODUCTION

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promotion. This scoping review will assess the current evidence status of massage chair and present clinical research agenda in future.

Rationale: Previous review included various types of electrically operated automated massage devices such as massage chair and beds, robotic modalities and mattresses for vibration and focused on the effect in muscular stimulation, peripheral circulation and physiological changes (EEG and HRV) [1]. This review covered broad spectrum of electric massage interventions but it did not include detailed intervention information and safety information. In this scoping review, we will focus on the massage chairs (and beds) only which are made for use without the operation or help by the healthcare practitioners and suggest evidence status on the benefit and harm of these interventions for various conditions. Through this, we will present overall evidence map for both physicians and customers and evidence gaps for the future research.

METHODS

Strategy of data synthesis: CORE databases including Pubmed, Embase, google scholar and Cochrane library will be searched until February, 2023. Additional databases such as CNKI for Chinese literature, OASIS for Korea literature and J-Stage for Japanese literature will be searched. Searching strategy will be developed based on each database's specific feature. Searching strategy for Pubmed is as follows: (("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields]) AND ("chair"[All Fields] OR "chair s"[All Fields] OR "chaired"[All Fields] OR "chairing"[All Fields] OR "chairs"[All Fields])) OR (("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields]) AND

("beds"[MeSH Terms] OR "beds"[All Fields] OR "bed"[All Fields])) OR (("automate"[All Fields] OR "automated"[All Fields] OR "automates"[All Fields] OR "automating"[All Fields] OR "automation"[MeSH Terms] OR "automation"[All Fields] OR "automations"[All Fields] OR "automation s"[All Fields]) AND ("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields]) AND ("chair"[All Fields] OR "chair s"[All Fields] OR "chaired"[All Fields] OR "chairing"[All Fields] OR "chairs"[All Fields])) OR (("robot"[All Fields] OR "robot s"[All Fields] OR "robotically"[All Fields] OR "robotics"[MeSH Terms] OR "robotics"[All Fields] OR "robotic"[All Fields] OR "robotization"[All Fields] OR "robotized"[All Fields] OR "robots"[All Fields]) AND ("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields])) OR (("automate"[All Fields] OR "automated"[All Fields] OR "automates"[All Fields] OR "automating"[All Fields] OR "automation"[MeSH Terms] OR "automation"[All Fields] OR "automations"[All Fields] OR "automation s"[All Fields]) AND ("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields])) OR (("acupressure"[MeSH Terms] OR "acupressure"[All Fields] OR "shiatsu"[All Fields]) AND ("chair"[All Fields] OR "chair s"[All Fields] OR "chaired"[All Fields] OR "chairing"[All Fields] OR "chairs"[All Fields])) OR (("massage"[MeSH Terms] OR "massage"[All Fields] OR "massages"[All Fields] OR "massaged"[All Fields] OR "massager"[All Fields] OR "massagers"[All Fields] OR "massaging"[All Fields]) AND ("reclination"[All Fields] OR "recline"[All Fields] OR "reclined"[All Fields] OR "recliner"[All Fields] OR "reclining"[All Fields]))).

In addition to this, clinical trial registry (International Clinical Trials Registry Platform, ICTRP) will be searched for on-going studies.

Eligibility criteria: Population: Any condition can be included. We will not impose any limitation on the selection of specific disease or patient's condition. Healthy individuals without any specific diseases can be included.

Intervention: Any types of massage chair or bed will be included. A massage chair needs to be an electric device which has rollers or airbags for automated massage stimulation. Any device needs manual operation by or direct involvement of healthcare professionals will be excluded in this study.

Comparator: We will not impose any limitations on the comparator.

Outcome: We will assess safety and effectiveness outcomes at the same time. Subjective outcomes such as pain or discomfort and objective outcomes such as blood chemistry or bioelectrical signals will be included in this review.

Study types: We will include clinical studies including randomized controlled trials, case studies (series), observational studies etc.

Source of evidence screening and selection: Located publications will be reviewed by two authors (T-HK and JWK) and selected individually. The list of selected studies will be discussed by two authors and final selection list will be decided. Screening process will be progressed in 2 steps. First, title and abstract review will be done first and after that hard copies will be reviewed.

Comparator: From the selected publications, information such as publication information such as authors, year, country of the first authors, journals etc. and data of the study such types of studies (SR, RCT, observational studies etc.), target disease (or conditions), Intervention (type of massage chair, company, stimulation methods (or modes), frequency, dose and duration of treatment,

concomitant treatments etc.), comparison group intervention, outcomes (safety and effectiveness related to the interventions) will be extracted. For assessing quality of evidence, AMSTAR for SRs and risk of bias for RCTs will be assessed. Overall quality of the research evidence on the specific condition was graded "High" when no or noncritical weakness was present in all items for SRs or RCTs "Moderate" when one more noncritical weakness was present in the items, "Low" when one or more critical limitation was identified.

Reporting results / Analysis of the evidence:

Each study information will be suggested based on the study type and conditions. We will present tables for summarizing included studies and interventions. On-going studies (except studies which have already published) will be summarized as well. Effect size for key outcomes of each condition will be suggested in each study level and meta-analysis will not be conducted. Safety outcomes such as type, frequency and severity of the adverse events will be suggested narratively.

Presentation of the results: For suggesting evidence mapping, a bubble plot which has three dimensions (x: effectiveness or harm; y: number of studies for each condition; bubble size: quality of evidence) will be suggested for presenting current evidence status of each condition. On-going studies will be suggested in the bubble plot as well. The evidence level of each bubble will be decided based on the most rigorous study in the evidence pyramid for each condition.

Language restriction: We will not impose any language limitation.

Country(ies) involved: Republic of Korea.

Keywords: Evidence, map, scoping review, massage chair, effectiveness, safety.

Contributions of each author:

Author 1 - Tae-Hun Kim - This author will participate in the study design, searching, selection of the studies, data extraction,

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Reference: [1] Paul, Ayan, et al. "Health efficacy of electrically operated automated massage on muscle properties, peripheral circulation, and physio-psychological variables: a narrative review." *EURASIP Journal on Advances in Signal Processing* 2021 (2021): 1-22.