INPLASY PROTOCOL

To cite: Peng et al. Telerehabilitation for Low Back Pain: A Systematic Review and Meta-analysis. Inplasy protocol 202310091. doi: 10.37766/inplasy2023.1.0091

Received: 31 January 2023

Published: 31 January 2023

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Support: **None.**

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

Conflicts of interest:
None declared.

Telerehabilitation for Low Back Pain: A Systematic Review and Meta-analysis

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Review question / Objective: **To conduct a systematic review to investigate the feasibility, safety, efficacy and application mode of telerehabilitation for individuals with low back pain.**
Condition being studied: **Chronic low back pain is one of the primary reasons for work loss, healthcare consumption, and disability. When considering years lived with disability, LBP is one of the leading causes of burden worldwide out of 291 conditions considered in-clinic treatment.**
Information sources: **Online databases (PubMed, Ovid, Embase and Web of Science) will be searched according to eligibility criteria. If more information about studies was needed, we will contact authors or website administrators.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 31 January 2023 and was last updated on 31 January 2023 (registration number INPLASY202310091).

INTRODUCTION

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METHODS

Search strategy: **(LBP or Low Back Ache or Lower Back Pain or Lumbago or Low Backache) AND (telemedicine or Telerehabilitation or Tele-rehabilitation or**

Virtual Rehabilitation or e-health or Mobile Health or Telehealth or mHealth or telecommunication or teleconference or telegraphy or internet-based or cyber or internet or web or online or app or wearable or sensor or VR or device).

Participant or population: The participants involved in these studies should be aged above 18 years old, undergoing low back pain. Non-specific LBP subjects, pregnant subjects will be excluded.

Intervention: Studies use telerehabilitation programs as intervention. Internet-based telerehabilitation could be the only intervention or combined with another physiotherapy or remote intervention. The telerehabilitation programs were performed through online platforms such as videos or graphic knowledge demonstrations, real-time communication with physicians or therapists, and group discussions to promote self-rehabilitation for individuals with LBP. It could be sometimes accompanied by electronic sensors. Rehabilitation content includes exercise, health coaching, patient education, medical information, real-time data analysis, and self-management. Interventions used for participants must be remote, such as e-mail, web pages, software systems, or wearable devices that can be online processed.

Comparator: Conventional rehabilitation (e.g., having rehabilitation in the clinic or hospital) that performed through non-remote platforms.

Study designs to be included: Cohort studies, controlled trials and randomized controlled trials will be included and only RCTs will be involved in meta-analysis.

Eligibility criteria: As above.

Information sources: Online databases (PubMed, Ovid, Embase and Web of Science) will be searched according to eligibility criteria. If more information about studies was needed, we will contact authors or website administrators.

Main outcome(s): The principal measurement outcome is the effectiveness of telerehabilitation including patients' pain intensity, defined by the Visual Analogue Scale (VAS) or the Numerical Pain Rating Scale (NPRS).

Additional outcome(s): Disability analysis will be conducted by the Oswestry Disability Index (ODI) or Roland Morris Disability Questionnaire (RMDQ). Mental health will be measured by Depression Anxiety Stress Scale (DASS) and function will be measured by the Patient-Specific Functional Scale (PSFS).

Quality assessment / Risk of bias analysis: For RCTs, we will use Cochrane Collaboration: Cochrane Handbook for Systematic Reviews of Interventions to assess the quality of selected studies. Different colors (green, red, yellow) and symbols "+", "-", "?") will be used to denote "low risk bias", "high risk bias" and "unclear bias". For each criterion, studies will be judged to be at either high or low risk of bias. Studies with a high risk of bias for 3 or more criteria were classified as being at high risk of bias overall. The Newcastle-Ottawa scale (NOS) will be used to assess the quality of selected cohort studies by 3 indicators: selection, comparability and outcome. Studies scoring ≥5 and ≤8 were designated low risk of bias, ≥3 and ≤4 as moderate and ≤2 as high.

Strategy of data synthesis: A meta-analysis will be conducted via Revman 5.3 for all outcomes in which at least 2 comparisons will be available. Forest plot will be used to display results. Only RCTs could enter into meta-analysis. All indicators will be continuous outcomes, thus will be summarized as means and SDs. Defects will be expressed as mean differences and 95% CIs. Data will be interpreted in light of changes in variables. For 3-arm RCTs, if the null hypothesis that the intervention groups did not differ (z test at 5% significance level) couldn't be rejected, all groups within the study will be pooled and only-telerehabilitation group will be defined as intervention while others will be defined as

control group; The heterogeneity of the studies will use the I2 statistic, which evaluated the consistency of study results. The cut-off for defining heterogeneity will be I2 > 50%. If the significant heterogeneity was observed then a random-effects model will be used. Otherwise, a fixed-effects model will be used. The strength of evidence will be judged by the precision of the CIs, suggesting clinically relevant improvements, and the heterogeneity.

Subgroup analysis: Subgroup analysis will be conducted based on telerehabilitation mode, intervention content, and remote intervention equipment.

Sensitivity analysis: Sensitivity analysis will be based on sample size and risk of bias on the overall summary estimates to evaluate whether this restricted analysis affected the magnitude, direction and statistical significance of the overall summary estimate.

Language restriction: Only articles published in English can be included in the study.English.

Country(ies) involved: China.

Keywords: Telerehabilitation; Low back pain; Efficacy; Safety; Feasibility.

Contributions of each author:

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