INPLASY PROTOCOL

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Support: **This systematic review receive.**

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Conflicts of interest:
None declared.

Application of smartphone apps in assessment after spine surgeries: a systematic review protocol

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Review question / Objective: **The aim of this systematic review is to investigate applications of smartphone apps in assessment and monitoring of postoperative symptoms and patient functions after spine surgeries.**
Condition being studied: **Some patients with spinal problems, such as Discopathy, need surgery. These patients need frequent follow-up and assessment of symptoms and function after surgery. Currently, the use of mobile applications is a new way to monitor and evaluate patients after spinal surgeries.**
Information sources: **Following databases were searched until 2021-03-16: Pubmed, Scopus, Embase via Embase, Web of Science Core Collection, CINAHL via EBSCO, Cochrane Central Register of Controlled Trials Via Ovid, ACM, Psycinfo.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 October 2021 and was last updated on 16 October 2021 (registration number INPLASY2021100054).

INTRODUCTION

Review question / Objective: **The aim of this systematic review is to investigate applications of smartphone apps in assessment and monitoring of postoperative symptoms and patient functions after spine surgeries.**

Condition being studied: **Some patients with spinal problems, such as Discopathy, need surgery. These patients need frequent follow-up and assessment of symptoms**

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and function after surgery. Currently, the use of mobile applications is a new way to monitor and evaluate patients after spinal surgeries.

METHODS

Search strategy: We used the following keyword combinations to find relevant articles: (app-delivered OR app OR apps OR app-based OR mhealth OR smartphone* OR "smart phone*" OR smartphone-based OR mobilephone* OR "smart-phone*" OR "mobile application*" OR "mobile health" OR Android* OR Ios OR Cellphone* OR "cell phone*" OR phone* OR "cellular phone*" OR ipad OR i-pad OR iphone OR i-phone OR ipod OR m-health OR "personal digital assistant" OR PDA OR SMS OR "social media*" OR Facebook OR Skyp* OR Whatsapp OR twitt* OR messag* OR texting OR "computer tablet*" OR "tablet computer*" OR "tablet-based" OR "smart devic*" OR "phone-assist*" OR "App Store" OR "Google Play" OR weChat OR instagram OR tiktok) AND (self-assess* OR "self assess*" OR self-assignment OR "self assignment" OR self-monitor* OR "self monitor*" OR self-measur* OR "self measur*" OR self-administ* OR "self administ*" OR "Self Evaluat*" OR "Self-evaluat*" OR "self apprais*" OR self-apprais* OR Self-Manag* OR "Self Manag*" OR self-direct* OR "self direct*" OR self-reflect* OR "self reflect*" OR self-rating OR "self rating" OR "self-percept*" OR "self-perform*" OR "self use" OR self-use OR "self care" OR self-care OR Feedback OR "patient report*" OR patient-report* OR Assess* OR diagnos* OR monitor* OR evaluat* OR measur* OR manag* OR apprais* OR rating) AND ((spin* OR Lumb* OR scoliosis OR cervical OR vertebr* OR disc) AND (surg* OR procedur* OR invasi*)) OR Kyphoplast* OR skyphoplast* OR Vertebroplast* OR Laminectom* OR Discectom* OR "Spinal fusion*" OR Corpectom* OR Rhizotom* OR Foraminotom* OR PLIF OR "Posterior Lumbar Interbody Fusion" OR Laminoplast* OR Nucleotom* OR Spondylodes* OR Spondylosyndes*).

Participant or population: Participants were those of any age or sex who had spinal surgery.

Intervention: Intervention duration and follow-up time is not specified and studies with different intervention and follow up duration will be included.

Comparator: Comparing with Control group is not necessary. If study had a control group, no treatment , treatment as usual, face to face intervention, etc. will be included.

Study designs to be included: Clinical trials (RCT and non-RCT, single group before-after), cohort.

Eligibility criteria: Inclusion Criteria:1. Participants were those of any age or sex who had spinal surgery2. Post spinal surgery period, defined as the point at which the patient leaves the operating theater, after a spinal surgery procedure (for example: Discectomy, Laminectomy, Vertebroplasty, Kyphoplasty, Spinal Fusion etc.)3. The paper uses a mobile health app, defined as an application (rather than a web-based tool) on a portable device (including smartphones and tablets). We include apps designed both for the patient and for the health care professional. We include all types of apps, including monitoring, and rehabilitation apps.4. The paper studies usability of the mobile health app. Any type of assessment is included, from structured questionnaire to analysis of engagement or time spent on the app.5. The paper must be a full paper (not an abstract).6. At least one of these outcomes should be assessed as intervention outcome: Pain, Physical Activity. Which have been measured using a quantitative valid scale.7. Study type: clinical trials (RCT and non-RCT, single group before-after), cohort8. Comparing with Control group is not necessary. If study had a control group, no treatment , treatment as usual, face to face intervention, etc. will be included.9. Intervention duration and follow-up time is not specified and studies with different intervention and follow up duration will be included.10. Only studies with app

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mediated interventions as the unique intervention will be included. The interventions which partially performed via mobile apps and the other part is performed in another way (face to face, web based etc.) will be excluded.Exclusion Criteria:1.The paper only uses web-based, text-based, or email-based technologies (no mobile health app). 2.Inappropriate study types, including reviews, case reports, and feasibility/pilot studies without any real-life postoperative analysis3.App is not designed for humans4.Studies that included additional devices (eg, a pulse oximeter, wearable devices).

Information sources: Following databases were searched until 2021-03-16: Pubmed, Scopus, Embase via Embase, Web of Science Core Collection, CINAHL via EBSCO, Cochrane Central Register of Controlled Trials Via Ovid, ACM, Psycinfo.

Main outcome(s): At least one of these outcomes should be assessed as intervention outcome: Pain, Physical Activity Which have been measured using a quantitative valid scale.

Data management: Search Results exported from Databases to Endnote and Rayyan, and the duplicates were checked and deleted. Then the screening was done by two researcher independently and the conflicts were checked by the third person. The information such as following will be extracted from all qualified studies by two researcher independently: Title, First Author, Year, Inclusion criteria, Total sample size, eHealth group size, Usual Care group size, Study type, Pathology and treatment, Activity, Pain Scale, etc.

Quality assessment / Risk of bias analysis: The Joanna Briggs Institute Critical Appraisal tool will be used by two independent reviewers for quality assessment.

Strategy of data synthesis: Since we do not have a meta-analysis in this review, we will only do a qualitative synthesis considering the extracted data such as country, study type, sample size, complications, etc.

Subgroup analysis: None.

Sensitivity analysis: None.

Country(ies) involved: Iran.

Keywords: smartphone apps, spine surgery, assessment.

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