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INPLASY

Impact of 'spin' on medical decision-making among medical professionals and stakeholders: a protocol for a systematic review

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202620006

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 2 February 2026 and was last updated on 2 February 2026.

INTRODUCTION

Review question / Objective We will systematically evaluate whether spin in medical research articles influences the impression or the interpretation of the research findings by healthcare professionals, patients, policymakers, and/or other relevant stakeholders and to explore the types and methods of interventions/strategies that could reduce such influence. Additionally, this review will seek to identify the resulting knowledge gaps and highlight the need for further research.
And we will include RCTs investigating 1) the impact of spin; and 2) the effect of interventions/trainings to mitigate the impact of spin.

Condition being studied We define spin as 'any reporting practices—intentional or unintentional—that, regardless of the result type (e.g., treatment effect, adverse effect, diagnostic accuracy), study design, or setting, fail to accurately reflect the nature and interpretable range of the results and distort readers' impression of the findings.' Spin commonly occurs by emphasising with 'narrative' to the research results or minimising adverse effects, leading the readers to perceive the results in a more favourable light.

METHODS

Search strategy MEDLINE (via Ovid), EMBASE, and CENTRAL. In addition, considering the possibility that relevant randomised controlled trials (RCTs) may be indexed within the field of medical education, we will also search Education Resources Information Center (ERIC) via EBSCOhost. Search strategies will be composed of two parts: (1) spin and frequently used words related to spin (e.g., 'mislead', 'overstated') and (2)

RCT filters modified and combined from The InterTASC Information Specialists' Sub-Group Search Filter Resource (ISSG).

Participant or population Healthcare professionals and stakeholders involved in health-related decision-making, including doctors, nursing professionals, patients, caregivers, students in health-related disciplines, researchers, reporters, or healthcare-related policymakers.
*Both two types of RCTs involve the same participant population.

Intervention (1) Studies should provide participants with content that is either artificially generated without spin or based on existing publications that have been edited to minimise or remove spin.
(2) Studies should test any kinds of intervention such as critical appraisal training (CAT) or evidence-based medicine (EBM) training to identify spin and interpret the research findings appropriately.

Comparator (1) The control group should be given (unedited) content in which spin is present or enhanced.
(2) The control group should receive either no training or other types of intervention, such as academic writing.

Study designs to be included RCTs.

Eligibility criteria We will include RCTs investigating 1) the impact of spin; and 2) the effect of interventions/trainings to mitigate the impact of spin. Both types of RCTs involve the same participant population: healthcare professionals and stakeholders involved in health-related decision-making, including doctors, nursing professionals, patients, caregivers, students in health-related disciplines, researchers, reporters, or healthcare-related policymakers.

(1) We will include RCTs that analyse whether participants' impression and/or interpretation of study findings are influenced by the presence or absence of spin in articles (including all types of scientific articles, news, or any products based on articles). Studies should provide participants with content that is either artificially generated without spin or based on existing publications that have been edited to minimise or remove spin. The control group should be given (unedited) content in which spin is present or enhanced. The outcome of interest is whether participants' impressions and/or interpretations (e.g., attitude, preference, or self-reported importance) of research findings are influenced by spin. Data will be included from time points immediately after exposure to content with spin.
(2) We will include RCTs that examine how participants' impression and/or interpretation change after receiving interventions/trainings about spin. Studies should test any kinds of intervention such as critical appraisal training (CAT) or evidence-based medicine (EBM) training to identify spin and interpret the research findings appropriately. The control group should receive either no training or other types of intervention, such as academic writing. However, interventions are not limited to training. Any type of intervention can be included as long as it serves the purpose of identifying spin and interpreting research results accurately. Such interventions may include the adjuvant use of artificial intelligence (AI) models or providing checklists. Outcomes include participants' ability to recognise spin and accurately interpret research findings after receiving interventions or training about spin or at follow-ups.
These outcomes in both types of RCTs can be measured using self-reported instruments (e.g., Likert-scale questionnaires or numeric rating scales), comprehension or interpretation tests, or objective measures such as the proportion of correct responses. Given the expected diversity in outcome measures across randomised trials assessing spin, we will not restrict studies based on the type of outcome measure.

Exclusion criteria
Studies not investigating human participants or studies involving non-health-related decision-making participants will be excluded. Non-randomised trials, protocols without results, reviews, case reports and observational studies will also be excluded. Because this systematic review will evaluate human readers, trials focusing on developing or training large language models or other generative AI systems to identify spin in research articles will be excluded, as these models are not considered decision-making agents but rather tools requiring training. Studies investigating outcome reporting bias instead of spin will also be excluded, as outcome reporting bias involves selective reporting of results rather than providing a distorted narrative about the results. Studies that exclusively examine the prevalence or severity of spin, without assessing its impact or evaluating the interventions aimed at correctly identifying spin, will be excluded. CAT or EBM training, or any kind of intervention that is not specifically focused on identifying or interpreting spin will also be excluded. Studies with mixed interventions where the impact of spin or the effect of interventions to

identify spin and correctly interpret research results cannot be separately evaluated, will also be excluded. Interviews and qualitative studies without exposure to spin or without training specifically designed to address spin will not be considered.

Information sources MEDLINE, CENTRAL, EMBASE, and ERIC.

Main outcome(s) (1) The outcome of interest is whether participants' impressions and/or interpretations (e.g., attitude, preference, or self-reported importance) of research findings are influenced by spin.
(2) Outcomes include participants' ability to recognise spin and accurately interpret research findings after receiving interventions or training about spin or at follow-ups

These outcomes in both types of RCTs can be measured using self-reported instruments (e.g., Likert-scale questionnaires or numeric rating scales), comprehension or interpretation tests, or objective measures such as the proportion of correct responses. Given the expected diversity in outcome measures across randomised trials assessing spin, we will not restrict studies based on the type of outcome measure.

Data management All retrieved articles will first be imported into Covidence (https://www.covidence.org/), where duplicates will be removed, and the remaining studies will be screened using the Covidence's integrated Cochrane RCT classifier, and by title and abstract. The records will then be screened independently by four reviewers (HP, SR, MK, and SC). A list of excluded studies will be retained and provided in the final review. If multiple publications appear to originate from the same study project, only the publication providing the most complete dataset will be included. Any disagreements will be resolved through discussion among reviewers. Study selection procedures will be presented in a PRISMA flow diagram.
Data will be extracted using a pre-designed data extraction form. One reviewer (IB) will perform the initial data extraction, and a second reviewer (HL) will verify the accuracy and completeness of the extracted data. Any discrepancies will be resolved through discussion between the two reviewers. Extracted data will be imported into and managed using Microsoft Excel (Office 2024, 64-bit). We will extract the following information: (1) Study information: publication year, first author, and country
(2) Participant characteristics: gender, age, total number of participants, participant category (e.g., healthcare professionals, patients, caregivers, students, or policymakers), prior training in EBM, evidence-based practice (EBP), or CAT (including its level and duration), research experience and role, clinical or research experience (in years), and the time interval between completion of a higher degree and study participation. We will classify participants based on World Health Organisation (WHO) classification of health workers, and it has been modified for this systematic review (3) Details of spin intervention and control groups: definition and classification of spin used in each study, methods used to generate or remove spin in the source materials, medical field of the source article, and study setting (e.g., online survey or assessments conducted during/after educational workshops), content, duration, and purpose of EBM, CAT, or any training course/workshop used as an intervention in the study. (4) Results of each outcome (5) Statistical analysis methods in each study. When outcome data are presented only in graphical form, numeric values will be extracted using Web PlotDigitizer version 4.7 (Automeris LLC). If essential data are missing, we will contact the first or corresponding author; if the data remains unavailable, the study will be included only in the descriptive synthesis and excluded from quantitative pooling.

Quality assessment / Risk of bias analysis We will assess the methodological quality of the included RCTs using the Cochrane Risk of Bias 2 (RoB 2) tool, which comprises six domains: (1) bias arising from the randomisation process, (2) bias due to deviations from intended interventions, (3) bias due to missing outcome data, (4) bias in outcome measurement, (5) bias in the selection of the reported result, and (6) the overall risk of bias. Each domain will be judged as having a low risk of bias, a high risk of bias, or some concerns. This assessment will be conducted independently by two reviewers (SC and IB), and any disagreements will be resolved through discussion or, if necessary, by consulting a third reviewer (HL).

Strategy of data synthesis If sufficient data are available, meta-analyses will be conducted. We will conduct a pairwise meta-analysis using Cochrane RevMan Web. Studies will be grouped into two categories: (1) RCTs that artificially manipulate spin content (generating or removing spin) to examine its impact on participants' impression and/or interpretation of the results, and (2) RCTs that provide the interventions (such as CAT or EBM training) to enable participants to identify spin and accurately interpret research results.

For dichotomous outcomes, risk ratios with 95% confidence intervals will be calculated. However, results expressed as continuous or ordinal variables for impressions or interpretations of the results may need to be converted into dichotomous variables (e.g. 'preferred' vs 'disliked' about results after reading content with spin). In such cases, the midpoint will be used as the reference point, and results will be also presented as risk ratio. For example, when Likert-scale responses are used to assess participants' impression and/or interpretation of spin, which commonly range from five to seven levels, we will dichotomise the responses using the neutral point as the cut-off to categorise whether participants' impression was influenced by spin. For continuous outcomes such as numerical rating scales, we will compute standardised mean differences, rather than mean differences, to account for the expected variability in measurement scales across studies. If standard deviations are not reported, they will be calculated according to the methods outlined in the Cochrane Handbook.

Given the expected diversity in participant backgrounds and study characteristics, a random-effects model will be applied. Statistical heterogeneity will be assessed using the I^2 statistic. Study findings will be presented in forest plots. If substantial heterogeneity or other methodological concerns prevent quantitative synthesis, a descriptive analysis will be conducted instead.

Subgroup analysis If substantial heterogeneity is detected, we will explore its potential sources through subgroup analyses. These analyses will be conducted based on pre-specified variables that are expected to influence the effect, including participants' prior research experience, their role in the health care system, i.e. by health worker classification, their history of training in EBM or EBP (including the duration and frequency of such training), and for those currently engaged in clinical practice, their years of clinical experience.

Sensitivity analysis Sensitivity analyses will be performed sequentially excluding studies judged to have a high risk of bias.

Language restriction There are no language limitations.

Country(ies) involved Korea, republic of democracy.

Other relevant information Publication bias will be assessed using a funnel plot, and asymmetry will be evaluated with Egger's test. However, if fewer than ten studies are included, Egger's test will not be performed due to insufficient statistical power.

Keywords spin, narrative bias, reporting strategy, overstated results, reporting bias,

Contributions of each author

Author 1 - Inhu Bae - IB and HL conceived and designed the study; IB will conduct literature search, data extraction, and analysis of data; IB led the drafting of the manuscript; and HL supervised the study. All authors read and approved the final protocol.
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