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Association between physician burnout and patient safety: study protocol for an overview of systematic reviews and meta-analyses

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ABSTRACT

Introduction Burnout, a disorder caused by chronic stress at work, involves emotional exhaustion, depersonalisation and reduced professional efficacy. The prevalence of burnout appears to be high among physicians worldwide. Burnout may affect different dimensions of healthcare, such as patient safety. Several systematic reviews and meta-analyses have examined the relationship between physician burnout and quality of care, although with some controversial results. To our knowledge, no overview of systematic reviews and meta-analyses has been conducted, specifically evaluating physician burnout, patient safety and other relevant aspects of quality of care. The main objective of this study will be to evaluate the available evidence of the association between physician burnout and patient safety.

Methods and analysis An overview of systematic reviews and meta-analyses will be carried out. Systematic reviews with or without meta-analyses assessing the relationship between burnout in physicians and quality of care will be included. The primary outcome will be patient safety (ie, the occurrence of any adverse event related to healthcare which could have resulted, or did result, in unnecessary harm to patients). Secondary outcomes will be patient satisfaction and professionalism. Literature searches will be conducted (from their inception onwards) in PubMed/MEDLINE, EMBASE and Cochrane Database of Systematic Reviews. Two researchers will select studies that meet the predefined eligibility criteria and proceed to extract information from each included study. The methodological characteristics, measures of association and qualitative conclusions of the reviews will be assessed. The methodological quality of each review will also be analysed using the AMSTAR-2 (A MeaSurement Tool to Assess systematic Reviews) tool. A descriptive synthesis will be carried out using evidence tables and graphs.

Ethics and dissemination The proposed research mainly involves the analysis of existing studies, approval from a research ethics committee is not required. This overview of systematic reviews will help to gain a better understanding of the association between physician burnout and patient safety. Our findings could support future research, recommendations and policies in this area. We plan to publish the full study in a peer-reviewed journal.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This overview of reviews will focus on evaluating the association between physician burnout and patient safety outcomes.
⇒ We will extract and analyse existing data from systematic reviews and meta-analyses, omitting data from primary studies not included in these reviews and analyses.
⇒ We do not plan to include grey literature.

Registration of the protocol Open Science Framework: https://osf.io/wr73u/

INTRODUCTION

Burnout is conceptualised by the International Classification of Diseases 11th Revision (ICD-11) as a syndrome resulting from chronic workplace stress that has not been successfully managed.[1] It is characterised by three dimensions: 'emotional exhaustion' (feeling of exhaustion or lack of energy), 'depersonalisation' (a greater mental detachment from one's work or feelings of negativism or cynicism about one's work) and, finally, 'self-fulfilment' (reduction in professional efficacy). This definition itself emphasises the work-related nature of the syndrome rather than the syndromic condition. The diagnosis of burnout is made at the clinical level with the use of validated scales, one of the most widely used is being the Maslach Burnout Inventory (MBI),[2] even though there are other scales.[3–5] Achieving accurate and ethical measurement of burnout is critical, as reliance on simplistic definitions or inadequate assessment tools can lead to misinterpretation of results.[6] The three dimensions (such as high emotional exhaustion, high depersonalisation and low personal accomplishment) are analysed independently; however, altered values in all three dimensions are considered suffering

burnout. Misclassifications, such as defining burnout based solely on negative scores in one dimension,[6] can inflate prevalence rates and detract from addressing the root causes of the disorder.

Healthcare workers and, in particular, physicians are at high risk of suffering burnout, which is believed to be due to work-related factors (eg, healthcare pressure, chaotic work environment, long working shifts, among others) and individual factors (gender, age, age of children, partner's occupation, etc).[7] In recent years, some research suggests that the prevalence of burnout among healthcare workers may have increased as a result of the COVID-19 pandemic, from 45% in 2019 to 60% in 2021.[8] Furthermore, the effects of burnout not only affect at the individual level with an increased risk of depression,[9 10] suicidal ideation,[11 12] substance abuse[13] and traffic accidents[14]; they can also have direct repercussions on the patient (eg, increased medical errors,[15] decreased satisfaction with the quality of care[16 17]) and organisations (eg, decreased productivity[18]). Physician burnout has been considered a growing problem in the field of public health.[19]

Several systematic reviews and meta-analyses on the association between burnout in physicians, quality of care and patient safety have been published in recent years,[20–24] with some of them surrounded by controversy.[24] For example, in July 2020, the journal JAMA Internal Medicine retracted the systematic review and meta-analysis on physician burnout and patient safety, professionalism and satisfaction published in 2018.[24] The editors followed the recommendations of a panel of experts who stated 'that, due to flaws in the systematic review process, it is likely that there are additional errors in the publication (…) and cannot confirm that the results of the meta-analysis are fully valid'.[24] On the other hand, the difficulty in interpreting the conclusions of the systematic reviews and meta-analyses that have been published on the subject could be due to the heterogeneity of the definitions of burnout, the different subscales assessed and the disparity of the population and methodological characteristics of the different studies. Given that several systematic reviews aimed at determining the association between physician burnout and patient safety, it is necessary to group them systematically and assess the methodological quality to help policy makers and managers make better evidence-based decisions.

Overview of systematic reviews (or umbrella reviews) is a knowledge synthesis approach for summarising and evaluating the evidence from multiple systematic reviews and meta-analysis in order to facilitate the transfer of knowledge into practical recommendations.[25–27] Overviews of systematic reviews have among their main objectives to collect information from multiple systematic reviews for the same topic and to map existing evidence on to establish knowledge gaps. However, to our knowledge, there is currently no overview of systematic reviews considering all the published systematic reviews and meta-analyses assessing the association between physician burnout and patient safety. Hence, we consider it relevant to conduct this evidence synthesis in order to assess any potential association and to provide a rigorous summary of the evidence from the available systematic reviews to facilitate and develop future recommendations.

The main objective of this study is to assess the existing evidence on the association between burnout in physicians and patient safety described in published systematic reviews and meta-analyses. Secondary objectives will be to analyse other relevant aspects related to the quality of care, such as patient satisfaction and professionalism.

METHODS

Study design

We plan to conduct an overview of systematic reviews and meta-analyses (or umbrella review) on measures of association. This study protocol has been reported following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) statement[28] (see online supplemental annex 1). Our study methods and results will be reported following the guidance in the PRISMA 2020 statement (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)[29] and the PRIOR 2022 statement (Preferred Reporting Items for Overviews of Reviews).[30] Prior to the start of the project, this protocol will be registered on the Open Science Framework platform (https://osf.io/wr73u/).

Eligibility criteria

The unit of analysis of this overview will be the systematic review. Systematic reviews will be selected according to the following criteria: study types, population, study outcome/condition of interest, publication status and language.

Study types: All systematic reviews with or without meta-analyses of any study type (eg, randomised trials, observational studies, quasi-experimental studies) will be included. Articles that explicitly state methods for identifying studies (eg, a search strategy), explicitly stated methods of study selection (eg, eligibility and selection criteria) and described methods of synthesis with or without quantitative data will be included as systematic reviews. Systematic reviews of studies where the association between physicians with burnout and patient safety is not assessed among their main objectives will be excluded.

Population: Systematic reviews that include physicians as the study population, regardless of age, ethnicity, gender, medical specialty, field of work or professional category (eg, residents and/or specialists) will be included.

Study outcome/condition of interest: Systematic reviews whose outcomes of interest include the association between burnout in physicians and quality of care, and more specifically, patient safety, patient satisfaction and medical professionalism (according to the definitions used by the researchers of the included studies) will be considered. The presence of burnout in physicians

should be collected using validated instruments (eg, MBI, Copenhagen Burnout Inventory, etc).

The primary outcome for this systematic review will be patient safety, according to existing definitions in the literature. For example, patient safety incidents can be understood as 'any unintended events or hazardous conditions resulting from the process of care, rather than due to the patient's underlying disease, that led or could have led to unintended health consequences for the patient or healthcare processes associated with safety outcomes[31] (eg, adverse drug events or other therapeutic and diagnostic incidents). This definition includes not only adverse drug events or other therapeutic and diagnostic incidents but also near misses—events that could have resulted in harm but did not, either by chance or through timely intervention.

Other dimensions of quality of care such as patient satisfaction (eg, physician communication attitudes, patient-reported satisfaction) and physician professionalism, defined by four fundamental principles of excellence, responsibility, altruism and humanism,[32] will be collected as secondary outcomes. Low levels of professionalism are an indicator variable for low quality of care and a precursor of patient safety events. Examples of low levels of professionalism include lack of adherence to therapeutic recommendations in clinical practice guidelines, multiple complaints and/or low patient empathy.

Publication status: Only systematic reviews indexed in the main databases searched (see, Sources of information section) will be considered, regardless of their publication status such as pre-publication, publication as a scientific article, and article withdrawn/retractions. This will allow to investigate any potential relationships between publication status (eg, retracted articles) and the methodological quality in systematic reviews.[33–35]

Languages: Systematic reviews published in English, Spanish, French or Portuguese will be included.

Other exclusion criteria

Systematic reviews assessing the association of burnout in health professionals including physicians and other healthcare professionals (eg, nurses or unspecified health professionals) will not be considered if outcomes are not presented specifically for physicians.

Sources of information

Several electronic databases of health sciences literature will be consulted for the information search (from their inception onwards). Specifically, searches will be carried out in MEDLINE (via PubMed), EMBASE and Cochrane Database of Systematic Reviews (via the Cochrane Library). Additional data sources will be used as manual review of bibliographic references of those reviews that have met the inclusion criteria to check if there are additional reviews that could be included in the study. In addition, Google Scholar will be searched to identify related papers. Authors of included reviews will be contacted (by email) if necessary.

Search strategies

The search strategy will contain keywords related to 'burnout', 'physicians', 'systematic reviews and meta-analyses' and 'patient safety and quality of care'. The first draft of the strategies will be developed by the review team (PV-C and FC-L) with the support of an information specialist. The main search strategy will be peer-reviewed by a second information specialist. The draft of the search strategy in PubMed/MEDLINE can be found in online supplemental annex 2.

Selection of studies

Once all the electronic databases have been searched, the results will be entered into a systematic review manager. This will be done using Rayyan software (Rayyan Systems Inc., Cambridge, Massachusetts, USA)[36] and duplicate articles will be removed. All articles will then be independently reviewed for title and abstract by two researchers (PV-C and AP-DC). Articles that do not meet the inclusion criteria as assessed by the two researchers will be excluded. In case of discrepancies, conflicting cases will be discussed among the two researchers and submitted to the judgement of a third researcher (FC-L) who will act to resolve the conflicts raised in the review, with or without inclusion of the assessed review into the research. The articles that are potentially eligible in the previous phase will be read in full text by two researchers (PV-C and AP-DC), proceeding to the elimination of those that do not meet the inclusion criteria of the study. After this step, a table will be created specifying the reason why they are not included. Additionally, the bibliographic references of the selected articles will be reviewed to analyse the possibility of the presence of relevant reviews that have not been previously included. A flow diagram of the selection process will be reported, using a specific application (PRISMA flow diagram).[37]

Data collection

After reading the articles, the data will be collected by two researchers (PV-C and AP-DC) independently. In addition, a senior researcher (FC-L) will supervise the data collection process. Tables will be designed in Microsoft Word or Microsoft Excel (Microsoft, Seattle, WA, USA) indicating the main characteristics of the studies. The data to be extracted from the included systematic reviews are:

- General characteristics of systematic reviews
  - First author and year of publication.
  - Publication status (eg, pre-publication, published article, retraction).
  - Country of correspondence author.
  - Name of the journal.
  - Number of databases used in the systematic review (eg, 1, 2, 3 or more) and names (eg, PubMed, EMBASE, SCOPUS, Web of Science, others).
  - Search time frame and languages.
  - Mention of the existence of a review protocol (yes/no), and if yes, where it is accessible (eg,

PROSPERO, Open Science Framework, Dryad, Zenodo, journal website/additional annex, institutional website, other).
  - Description of the tools for conducting/reporting the review (eg, PRISMA, AMSTAR-2, Cochrane Handbook).
  - Submission of a completed checklist (yes/no).
  - Mention of a risk of bias assessment tool for the included studies and its name (eg, Cochrane Risk of Bias tool, ROBINS-I, Newcastle-Ottawa scale, JBI critical appraisal tools).
  - Source of funding (eg, public, private, mixed, none or not available).
- Specific characteristics of the selected systematic reviews
  - Description of the exposure (eg, definition of burnout and core dimensions used).
  - Description of the outcomes of interest (eg, definition of the different dimensions of quality of care and patient safety, including instruments used where possible) and source of information (eg, self-reported patient safety incidents).
  - Number and design of studies included in the systematic review (eg, randomised controlled trials, non-randomised trials, observational studies, quasi-experimental studies).
  - Description of the characteristics of the participants of the studies included in the systematic review (number, mean or median age, percentage female, specialties evaluated, percentage of residents in the sample, percentage with less than 10 years of experience).
  - Measure of association used to assess the relationship between burnout and the variables of interest (eg, OR, logOR, RR or other measures of association presented in different studies) and with a corresponding measure of uncertainty (eg, 95% CI).
- Synthesis methods used in systematic review
  - Type of evidence synthesis (eg, narrative/qualitative and quantitative/meta-analysis).
  - If meta-analysis, model used (eg, fixed effects, random effects, both, not specified).
  - If applicable, presentation of the summary effect estimate of the meta-analysis and its 95% CI.
  - If meta-analysis, presentation of heterogeneity statistics (eg, I^2 index).
  - Additional analysis (eg, subgroup analysis, meta-regression, other, none).
- Results or conclusions presented in systematic reviews

Quantitative results presented in the included systematic reviews will be extracted as measures of association (eg, OR, RR). If comparable and an enough number of measures are found, the results will be presented using forest plots. Information will also be extracted from the qualitative findings or conclusions presented in the included systematic reviews. These will be defined as a risk factor if the authors notify an increased risk of suffering an adverse event when treated by physicians with burnout (eg, mentioned as 'increased risk', 'consistent relationship', 'more likely to suffer', 'safety concern') or as a protective factor if the conclusions are clearly contrary to the above (eg, 'there is an inverse relationship', 'burnout is unlikely to increase the risk of an adverse event', 'it improves the quality of care'). And finally, neutral or inconclusive when the association of interest is neutral or even when the conclusions are expressed with a high degree of uncertainty.

Methodological quality assessment by AMSTAR-2

At least two researchers (PV-C and AP-DC) will assess the methodological quality of included systematic reviews using AMSTAR-2,[38] a tool used for the critical assessment of the methodological quality of systematic reviews (see online supplemental annex 3). In case of any discrepancies, a third researcher (FC-L) will participate in the elaboration of the final assessment of each review. Briefly, AMSTAR-2 presents a checklist with short answer options ('yes', 'no' and 'partial yes') that assess different relevant domains of the systematic review. These domains are subdivided into seven critical and nine non-critical domains depending on whether they are considered to significantly affect the validity of the results. The assessment of each review is done by giving an overall degree of confidence ('high', 'moderate', 'low' and 'critically low') for the final outcomes.

Certainty of the evidence

Where a systematic review has assessed the certainty of the evidence (eg, according to the GRADE framework[39]), this information will be extracted and presented. Otherwise, the necessary information will be extracted from the systematic review to perform their assessment. We will use the GRADE (Grades of Recommendation, Assessment, Development and Evaluation) to report the certainty of evidence[39] which considers study limitations, inconsistency of results, indirectness of evidence, imprecision and reporting bias. According to GRADE, the certainty of the evidence can be qualified as high quality (eg, very confident that the true association lies close to that of the estimate of the effect), moderate quality (eg, moderately confident in the effect estimate), low quality (eg, confidence in the effect estimate is limited because the true effect may be substantially different from the estimate of the effect) and very low quality (very little confidence in the effect estimate because the true effect is likely to be substantially different from the estimate of effect).

Data synthesis

A narrative synthesis of the main findings of the selected systematic reviews will be made, and all extracted data will be presented in evidence summary tables. For each systematic review, general elements, methodological elements, assessment of biases and measures of association will be presented. We will describe the extent of primary study overlap across the included systematic reviews.

A descriptive analysis will be performed, using frequency counts, percentages and measures of association, as well as the results obtained in the AMSTAR-2 checklist.[38] Specifically, the results of the methodological quality assessment using the AMSTAR-2 tool will be represented in tabular and/or graphical format (eg, bar charts) specifying the results in each domain, the number of critical and non-critical weaknesses, as well as the result of the confidence level of the analysed studies. The results in each domain, the number of weaknesses and the overall confidence level of each of the included studies, as well as the overall percentage of total compliance in each domain, shall be presented in summary tables for easier presentation. To select a systematic review for reporting the association of physician burnout and patient safety, the following decision algorithm will be followed according to a comprehensive summary and methodological quality of the systematic reviews. The systematic review contains the highest number of primary studies in the group of systematic reviews rated with high or moderate overall quality in their results according to AMSTAR-2 will be chosen. Priority will be given to systematic reviews with a high-quality rating according to AMSTAR-2.

A discussion of any limitations of the evidence from systematic reviews and their primary studies included in the overview of reviews will be also reported in the final manuscript.

Patient and public involvement

The draft protocol was revised on receiving feedback from all the research team (including methodologists, scientists and healthcare professionals). Patients or the public were not involved in the setting of the research question, nor in developing plans for design/writing of our protocol. Patients or the public will not be asked to advice on the interpretation or writing up of findings.

Ethics statement and dissemination plan

Because of the characteristics of the proposed systematic reviews, which is mainly based on the analysis of previous studies, no approval by a research ethics committee is required. Any changes to the protocol will be declared in an appendix to the final manuscript and in a public repository. The results will be presented in conferences, congress attendance and publications in peerreviewed journals. All data referenced in the final manuscript will be deposited in a public repository such as the Open Science Framework https://osf.io.

Other considerations

The recommendations of the PRISMA 2020[29] statement and the PRIOR 2022[30] statement will be followed for the reporting of methods and results of this overview of reviews.

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Competing interests None declared.

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