

# An Overview of Reviews to Inform Organization-Level Interventions to Address Burnout in Rheumatologists

Hengameh Kheirkhah<sup>1</sup>, Nicole M.S. Hartfeld<sup>1</sup>, Jessica Widdifield<sup>2</sup> , Stephanie Kulhawy-Wibe<sup>1</sup>, Janet Roberts<sup>3</sup>, Elaine A. Yacyshyn<sup>4</sup> , Jennifer J.Y. Lee<sup>5</sup> , Konstantin Jilkin<sup>6</sup> , Dana Jerome<sup>7</sup> , Timothy S.H. Kwok<sup>7</sup> , Jennifer Burt<sup>8</sup> , and Claire E.H. Barber<sup>9</sup> 

**ABSTRACT.** *Objective.* To identify organization-directed strategies that could be implemented to prevent burnout among rheumatologists.

*Methods.* A search of English language articles published 2011 or later was conducted on Cochrane Database of Systematic Reviews, Embase, Medline, and PsycInfo on January 25, 2022. Included reviews had  $\geq 1$  primary studies with  $\geq 10\%$  of participants who were physicians, recorded burnout as an outcome, and described an organization-directed intervention to prevent burnout. Overlap of primary studies across reviews was assessed. The final review inclusion was determined by study quality, minimization of overlap, and maximization of intervention breadth. The A Measurement Tool to Assess Systematic Reviews (AMSTAR) 2 tool was used for quality assessment. Included studies and interventions were assessed by rheumatologists for their applicability to rheumatology.

*Results.* A total of 17 reviews, including 15 systematic reviews, 1 realist review, and 1 umbrella review were included. AMSTAR 2 quality ratings classified 5 systematic reviews as low quality, 1 as moderate, and 9 as critically low. There was significant heterogeneity between and within reviews. Six conducted a metaanalysis and 11 provided a qualitative summary of findings. The following intervention types were identified as having possible applicability to rheumatology: physician workflow and organizational strategies; peer support and formal communication training; leadership support; and addressing stress, mental health, and mindfulness. Across interventions, mindfulness had the highest quality of evidence to support its effectiveness.

*Conclusion.* Although the quality of evidence for interventions to prevent burnout in physicians is low, promising strategies such as mindfulness have been identified.

*Key Indexing Terms:* health services, quality of life, work

Burnout is conceptualized as a combination of emotional exhaustion, depersonalization (ie, increased mental distance or indifference toward work), and a diminished sense of personal accomplishment resulting from chronic workplace stress.<sup>1,2</sup> It is included in the International Classification of Diseases, 11th revision (ICD-11) as a syndrome and occupational phenomenon influencing health status, but is not a medical disease or disorder.<sup>2</sup> Physician burnout is a significant problem in modern

medicine. It affects medical students,<sup>3</sup> residents,<sup>4</sup> and practicing physicians.<sup>5</sup> Internationally, the prevalence of physician burnout has been challenging to determine because of variability in definitions and assessments.<sup>5</sup> In a previous systematic review of physician burnout, the prevalence ranged from 0% to 80%.<sup>5</sup> In the United States, a trend toward improvement in burnout was seen between 2011 and 2017; however, 1 or more symptoms of burnout continued to be reported by 44% of physicians

*This study was supported as part of the workplan of the Canadian Rheumatology Association HR Committee. CEHB is funded through the Arthritis Stars Career Development Award from the Canadian Institutes of Health Research, Institute of Musculoskeletal Health and Arthritis (STAR-19-0611.CIHR SI2-169745).*

<sup>1</sup>H. Kheirkhah, MD, N.M.S. Hartfeld, MSc, MC, S. Kulhawy-Wibe, MD, MSc, Cumming School of Medicine, University of Calgary, Calgary, Alberta;

<sup>2</sup>J. Widdifield, PhD, Sunnybrook Research Institute, University of Toronto, ICES, Toronto, Ontario; <sup>3</sup>J. Roberts, MD, Division of Rheumatology, Department of Medicine, Dalhousie University, Halifax, Nova Scotia;

<sup>4</sup>E.A. Yacyshyn, MD, MScHQ, Division of Rheumatology, Department of Medicine, University of Alberta, Edmonton, Alberta; <sup>5</sup>J.Y. Lee, MD, MSc, Division of Rheumatology, Department of Pediatrics, University of Toronto, Toronto, Ontario; <sup>6</sup>K. Jilkin, MD, Section of Rheumatology,

Department of Medicine, University of Manitoba, Winnipeg, Manitoba;

<sup>7</sup>D. Jerome, MD, MEd, T.S.H. Kwok, MD, MSc, Division of Rheumatology, Department of Medicine, University of Toronto, Toronto, Ontario; <sup>8</sup>J. Burt, PT, ACPAC-trained ERP, Rheumatology Services, Eastern Health, St. John's, Newfoundland and Labrador; <sup>9</sup>C.E.H. Barber, MD, PhD, Cumming School of Medicine, University of Calgary, Calgary, Alberta, and Arthritis Research Canada, Vancouver, British Columbia, Canada.

*The authors declare no conflicts of interest relevant to this article.*

*Address correspondence to Dr. C.E.H. Barber, Division of Rheumatology, University of Calgary, HRIC3.AA20-3280, Hospital Dr. NW, Calgary, AB T2N 4Z6, Canada. Email: cebbarbe@ucalgary.ca.*

*Accepted for publication July 13, 2023.*

surveyed in later years.<sup>6</sup> In addition, the coronavirus disease 2019 (COVID-19) pandemic contributed substantially to heightened physician burnout globally.<sup>7,8</sup>

Although the prevalence of burnout among rheumatologists is not well reported, recent investigations suggest it is substantial, at around 50%. In 2019 and prior to the COVID-19 pandemic, a survey of 128 rheumatologists demonstrated that at least 50% had burnout in 1 or more domains of the Maslach Burnout Index (MBI).<sup>9</sup> In a national Canadian Rheumatology Association (CRA) survey in 2020, 51% of respondents reported burnout with higher rates observed in women and younger rheumatologists.<sup>10</sup> Similarly high burnout prevalence has been reported among rheumatologists in Latin America,<sup>11</sup> South Asia,<sup>12</sup> and the US.<sup>13-15</sup>

The factors contributing to rheumatologist burnout have not been well elucidated, and it is unclear if and how much they differ by medical specialty. Electronic health record (EHR) dissatisfaction has been noted as a contributing factor within rheumatology<sup>9</sup> and other physician specialties. Factors contributing to EHR-related burnout include insufficient time for documentation, high volume of inbox and/or patient call volumes, and negative physician perceptions of EHRs.<sup>16</sup> The increasing feminization of rheumatology<sup>17</sup> as a specialty may also be playing a role, with female rheumatologists experiencing higher rates of burnout compared to male colleagues.<sup>10</sup> In a Latin American survey, rheumatologists reported additional factors that contributed to their burnout including insufficient income, long working hours, administrative responsibilities, government regulations, lack of respect from staff or patients, EHRs, and lack of autonomy.<sup>11</sup> Among pediatric rheumatologists, the use of telemedicine during the COVID-19 pandemic increased burnout; this was attributed to the difficulty in performing the musculoskeletal physical examination virtually.<sup>18</sup> In a qualitative evaluation of early career rheumatologists, excessive administrative tasks including documentation, billing, and insurance and pharmaceutical company paperwork were identified as major threats to well-being.<sup>19</sup>

Although the consequences of rheumatologist burnout have not been reported, to our knowledge, the consequences of physician burnout in general are well described and are not limited to effects on personal well-being. Many studies have shown provider burnout affects patient care as it can be associated with increased medical errors, lower patient satisfaction, decreased professional work effort, and loss of productivity.<sup>5,20,21</sup> Given projected workforce shortages in rheumatology nationally<sup>10</sup> and internationally,<sup>22</sup> high rates of burnout among the workforce may compound challenges in the field and negatively affect access to care for patients. Addressing burnout has been one suggested strategy to retain rheumatologists in the workforce.<sup>23</sup>

Given the documented high rate of burnout among Canadian rheumatologists, the CRA Human Resources (HR) Committee embarked on a review of organization-level strategies with potential to address rheumatologist burnout. To this end, we conducted an overview of reviews on interventions addressing physician burnout to identify strategies that could be implemented in the rheumatology workforce.

## METHODS

The complete study protocol and abstraction tools were developed a priori and are available from the corresponding author upon request. Although a de novo systematic review methodology was considered, preliminary searches did not reveal any rheumatology-specific data. Owing to the high number of existing systematic reviews on interventions to address physician burnout, we determined that an overview of reviews would be most useful to inform discussions about strategies to address physician burnout at an organizational level in rheumatology.

*Search strategy.* The search strategy was developed by HK and CEHB in consultation with a medical librarian (search strategy in the Supplementary Material, available with the online version of this article). It was adapted for each included database. A search of Cochrane Database of Systematic Reviews, Embase, Medline, and PsycInfo was undertaken on January 25, 2022. Search results were restricted to English language articles published in 2011 and later. Because of lack of team language competencies and funds available for translation services, language restriction was necessary. The publication time frame was selected because the operation of healthcare organizations has evolved rapidly (eg, widespread use of EHRs), and studies published prior to 2011 are unlikely to be relevant to physicians practicing today.

*Selection criteria.* The review considered studies that included physicians working in primary, secondary, or intensive care settings. Studies that focused on medical students and physicians in training were excluded because of the different responsibilities encountered in these career stages compared to attending physicians. Similarly, other nonphysician healthcare providers and staff members were excluded. Given our focus on organization-level interventions, it was anticipated that some relevant intervention studies may include mixed participant samples. To be included, studies must have contained  $\geq 10\%$  of participants who were physicians.

Interventions designed to prevent burnout and implemented at the organization level were eligible. To qualify as an organization-level intervention, the intervention must be organized, financially supported, or made accessible to physicians through their employer. Interventions that were directed at the individual and/or organized outside the workplace were excluded. For example, a community-based mindfulness group would be excluded, but a mindfulness program organized through the workplace at no cost to the employee and with protected time for attendance would be included. All comparators were eligible for inclusion (eg, no comparator, waitlist control).

The outcome of interest was burnout or a related measure of work-related stress. Acute stress, secondary posttraumatic stress disorder, vicarious trauma, and other stress-related outcomes (eg, general stress) were excluded. Other mental health concerns such as anxiety and depression, as well as measures of positive well-being and protective factors (eg, self-compassion) were not eligible. Studies in which burnout was a secondary outcome were included, regardless of whether burnout was the target of the review.

The review considered studies with the following designs: systematic reviews, realist reviews, and umbrella reviews. All reviews were included regardless of heterogeneity among included study designs. The selection criteria were designed to establish a broad scope to identify all interventions that may be relevant to our objective, regardless of the level of evidence. Ineligible articles included conference abstracts, editorials, letters to the editor, gray literature, study protocols, theses and dissertations, observational studies, experimental studies, quasi-experimental studies, and studies for which the full text was not available.

*Study selection.* All citations identified in the database searches were first uploaded into EndNote, then Covidence,<sup>24</sup> and identified duplicates were removed. Three reviewers (CEHB, HK, NMSH) completed screening of titles and abstracts using Covidence.<sup>24</sup> Each study was reviewed against the established selection criteria by 2 independent reviewers. The full text articles of potentially relevant studies were retrieved and reviewed by 2 inde-

pendent reviewers (HK, NMSH). All disagreements were resolved through discussion until consensus was reached.

We followed established methods for conducting a systematic review of reviews, including identifying and managing overlapping systematic reviews as outlined in the Cochrane Handbook for Systematic Reviews of Interventions.<sup>25</sup> For the selected reviews, the overlap of primary studies was assessed by producing a citation matrix. This step involved listing each of the primary studies included in the selected reviews and mapping them to the reviews in which they were identified. The resulting matrix was used to inform decision making to avoid double counting outcome data from overlapping reviews and ensure that a primary study's outcome data were extracted only once. Next, each identified review was assessed against the selection criteria. We also excluded reviews when none of the primary studies met our selection inclusion.

Reviews containing at least 1 unique primary study (ie, not identified in any other review) were selected for data extraction. This decision was justified by our aim to identify all potentially relevant interventions. The cost of losing relevant data was deemed to be greater than that of double counting overlapping primary studies in the context of our objectives. The reviews for which all relevant primary studies overlapped in other reviews were assessed for selection based on recency, comprehensiveness, and quality. Inclusion decisions were made such that all unique primary studies were captured by the fewest number of high-quality reviews. This most often resulted in retention of the most recent and comprehensive reviews and removal of those that were older and narrower in scope. When a review was included as a primary study in a more recent review, the most recent publication was included, and the subsumed review removed.

**Quality assessment.** Two reviewers (NMSH and CEHB) evaluated each study using A Measurement Tool to Assess Systematic Reviews (AMSTAR) 2 to evaluate the methodological quality of the included systematic reviews.<sup>26</sup> Overall, quality assessment was determined using the scheme for interpreting weakness developed by Shea et al using the 7 critical AMSTAR 2 items, and the 9 noncritical items.<sup>26</sup>

**Data extraction.** Our a priori analysis plan was to summarize only the results from high-quality studies by AMSTAR 2 criteria.<sup>26</sup> However, because of the low number of high-quality studies available, this was not possible; therefore, we decided to review and report on all studies, regardless of quality. Two reviewers (HK, NMSH) extracted data from the included reviews using an extraction tool developed a priori for this study and according to Cochrane guidance on data extraction for this type of review.<sup>25</sup> The extracted data included characteristics of the selected reviews including scope, population, method, and limitations. Extraction also included specific details about the interventions and outcomes. Where there was a metaanalysis done, the summary results were extracted; where no metaanalysis was conducted, descriptive findings were noted to facilitate a narrative synthesis of results. Although the objective was organization-directed interventions, some reviews also included physician-directed interventions; a summary of these findings was included as well for comparison. Additionally, many studies pooled the results of organization- and physician-directed interventions, which made data extraction and analysis difficult. Results were extracted and reported separately where possible. Authors were not contacted for missing information, as this was felt unlikely to substantially change the findings of the study.

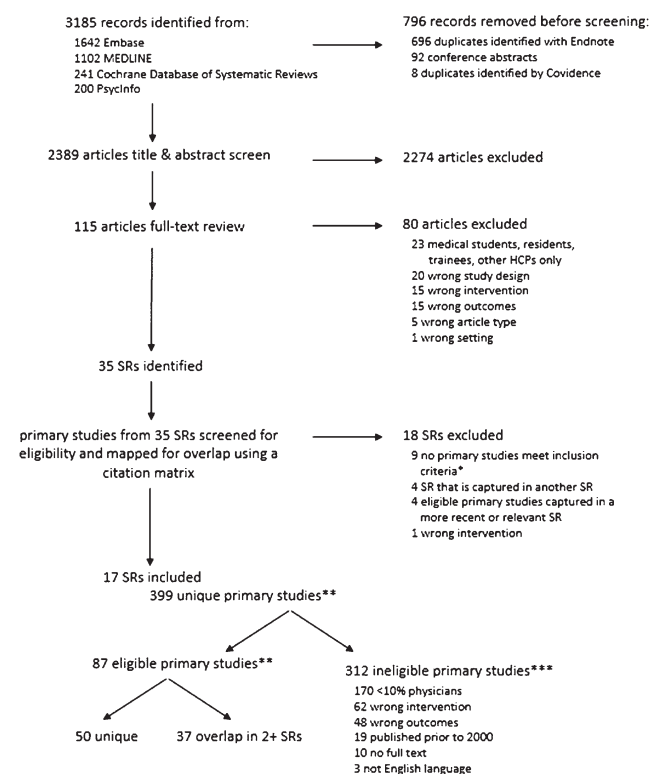
**Rheumatologist review.** The results were reviewed first by 1 rheumatologist (CEHB) and 1 rheumatology resident (HK) to ascertain potentially relevant interventions for rheumatologists, excluding interventions applicable only to unrelated specialties (eg, surgery). A narrative review of interventions was then completed.

## RESULTS

The search retrieved 3185 records, of which 796 were duplicates. After removal of duplicates, 2389 articles were retained

for title and abstract screening. Full-text review was completed for 115 articles and resulted in the identification of 35 reviews. Following assessment of primary study eligibility and overlap, 17 reviews were selected for data extraction.<sup>27-43</sup> These selected reviews contained a total of 399 unique primary studies, 50 of which were relevant to our objective. See the Figure for a detailed summary of results from the study selection process.

The characteristics of selected reviews are presented in Table 1. There were 15 systematic reviews,<sup>27-34,36,38-43</sup> 1 realist review,<sup>37</sup> and 1 umbrella review.<sup>35</sup> Reviews were published between 2015 and 2021. The number of primary studies in each review ranged from 6 to 81 (median 19 [IQR 13-36]). The number of relevant primary studies ranged from 2 to 24 (median 7 [IQR 5-11]) for each review. There was insufficient information reported in 7/17 reviews to determine the proportion of participants who were physicians. Of those with information, the proportion of physician participants was above 50% in 6/10 reviews. Nonphysician participants most frequently included physicians in training, medical students, and interdisciplinary health professionals such as nurses. No studies were conducted in rheumatology, although rheumatologists may have been included in some of the study samples. Four reviews were specific to physicians practicing in a particular setting (eg, emergency care), whereas 5 were open to any setting (eg, primary, secondary, or intensive care), and 8 did not address setting in the inclusion criteria.



**Figure.** Flow diagram of inclusion of reviews. \* Based on the SR inclusion criteria, it was possible for primary studies to include organization-level burnout interventions with  $\geq 10\%$  of participants being physicians, but full-text review of the primary studies revealed that none met these criteria. \*\* Including primary studies from the 4 SRs captured in another SR. \*\*\* Reasons for exclusion are reported in the order of priority that was followed when determining eligibility. HCP: healthcare provider; SR: systematic review.

Table 1. Characteristics of systematic reviews.

Study	No. of Studies	No. of Relevant Studies	Estimated Proportion of Physician Participants <sup>a,b</sup> , n (%)	Types of Nonphysicians <sup>c</sup> Included	Setting	Systematic Review Aim
Bazargan-Hejazi 2021 <sup>33</sup>	21	11	1393/2730 (51)	Residents, fellows	Primary, secondary, or intensive care	Review the outcomes of positive psychology interventions using the PERMA framework to enhance physician well-being or reduce burnout
Bresteti 2020 <sup>34</sup>	6	2	Unknown	Nurses, nurse practitioners, chaplains, social workers, allied HCPs, others	Neonatal ICUs	Identify and evaluate the effectiveness of burnout interventions within neonatal ICUs
De Simone 2021 <sup>27</sup>	19	11	Unknown	Residents, fellows	Primary, secondary, or intensive care	Evaluate whether individual or organizational strategies are more effective to reduce physician burnout
De Sio 2020 <sup>35</sup>	36	6	Unknown	Nurses, technicians, HCPs	Not specified	Review of preventive measures against mental disorders, work-related stress, and burnout in physicians
Dijxhoorn 2021 <sup>36</sup>	59	6	5839/13845 (42.2)	Nurses, nursing assistants, home care workers, social workers, psychologists, chaplains, volunteers, other HCPs	Palliative care	Investigate the prevalence of burnout and the evidence for interventions aimed at preventing burnout in HCPs providing palliative care
Gray 2019 <sup>37</sup>	55 <sup>d</sup>	13	Unknown	Nurses and nursing staff, midwives, administrative staff, managerial staff	Primary, secondary, and other facilities and organizations	Realist review exploring which organization-directed interventions promote mental health among healthcare workers
Nachrig 2021 <sup>38</sup>	19	16	502/1141 (44)	Nurse practitioners, primary HCPs, other HCPs not otherwise specified	Primary care	Exploring the effect of any type of intervention on the well-being and satisfaction of general practitioners
Panagioti 2017 <sup>28</sup>	19	11	529/1550 (34.1)	Residents, fellows	Primary, secondary, or intensive care	Evaluate effectiveness of interventions to reduce physician burnout Reviewed whether type of intervention, physician characteristics, and healthcare setting were associated with outcomes
Ruiz-Fernández 2020 <sup>29</sup>	9	4	Unknown	Nurses	Not specified	Evaluate effectiveness of mindfulness interventions for HCPs on the outcomes of stress reduction, and improving self-compassion and mindfulness
Salvado 2021 <sup>30</sup>	10	8	327/417 (78.4)	Nurses, social workers, psychologists, others	Primary care	Evaluate effectiveness of mindfulness-based interventions for reducing burnout in primary HCPs
Scheepers 2020 <sup>39</sup>	24	13	748/1206 (62)	Residents	Diverse specialties	Evaluate effectiveness of mindfulness-based interventions on doctors' well-being and performance
Taylor 2018 <sup>40</sup>	10 <sup>e</sup>	2	Unknown	Undergraduate students, graduate students, nonphysician hospital staff (eg, nurses)	Not specified	Evaluate the evidence for Schwartz Center Rounds with healthcare staff and conduct a scoping review of comparator interventions (eg, Balint groups)
Thomas Craig 2021 <sup>41</sup>	81	24	10,958/12,952 (84.6)	Residents, medical interns, trainees, fellows, assistant lecturers	Any practice setting including primary, secondary, mixed, or unspecified care	Identify organization-directed interventions to reduce physician burnout and conduct a subgroup analysis to identify and summarize interventions to reduce digital tool burden and their effect on workflow inefficiencies
van Mol 2015 <sup>42</sup>	40	6	Unknown	Fellows, interns or residents, nurses, nurse assistants, chaplains, child life specialists, social workers, respiratory therapists, others	ICUs	Evaluate the prevalence of burnout and compassion fatigue among HCPs working in ICUs and identify effective preventive strategies



Table 1. Continued

Study	No. of Studies	No. of Relevant Studies	Estimated Proportion of Physician Participants <sup>a,b</sup> , n (%)	Types of Nonphysicians <sup>c</sup> Included	Setting	Systematic Review Aim
Venegas 2019 <sup>31</sup>	26	7	1047/1140 (91.8)	Other HCPs	Any	Identify and evaluate the effectiveness of interventions to increase resiliency in physicians
Wiederhold 2018 <sup>43</sup>	13	5	6908/7423 (93.1)	Medical residents, physician trainees, operators of oncology centers, medical house officers	Not specified	Evaluate the evidence for interventions to affect physician burnout
Xu 2020 <sup>32</sup>	14	5	261/1033 (25.3)	Nurses, nonclinical administrative staff, emergency medical technicians	Any hospital setting providing emergency care	Evaluate the evidence for interventions to reduce burnout and occupational stress in health personnel working in emergency departments

<sup>a</sup>Where  $\leq 2$  original studies have mixed samples with insufficient information in the systematic review to determine the number of physicians, the entire sample size was counted in the denominator and 0 physicians were counted in the numerator. <sup>b</sup>Due to limited detail in the reporting of participant characteristics, it is not possible to determine the exact proportion of physicians. <sup>c</sup>Medical students, residents, and fellows were considered nonphysicians for the purpose of our review due to the different responsibilities and needs of individuals in these stages of their careers compared to attending physicians. <sup>d</sup>55 unique studies published across 60 articles. <sup>e</sup>10 unique studies published across 12 articles. HCP: healthcare provider; ICU: intensive care unit; PERMA: positive emotions, engagement, relationships, meaning, achievement.

A metaanalysis was conducted in 6 of the reviews,<sup>27-32</sup> with results summarized in Table 2. Overall, the findings indicate that tested interventions led to small to moderate reductions in burnout. Organization-directed interventions were found to be more effective than physician-directed interventions in 2 comparative analyses,<sup>27,28</sup> whereas in a third comparative analysis the results favored physician-directed interventions.<sup>32</sup> Table 3 presents a summary of the outcomes from the remaining reviews without metaanalyses.<sup>33-43</sup> Review authors highlighted the heterogeneity of the evidence, citing concerns about low quality of evidence, high risk of bias, and high variability in study design, interventions, outcome measures, instruments, and conceptualizations of burnout. Findings were often presented with the caveat that they be interpreted with caution as a result of this heterogeneity. Across all reviews, the strongest evidence appeared to be for mindfulness-based interventions. Yet, even among mindfulness-based interventions, the considerable heterogeneity in intervention protocols has been identified as a weakness of the literature.<sup>39</sup>

*Quality ratings.* Table 4 presents the AMSTAR 2 quality assessment results. The 1 realist review<sup>37</sup> and 1 umbrella review<sup>35</sup> were not included in the AMSTAR 2 assessment as it was developed specifically for systematic reviews.<sup>26</sup> One review was rated as moderate, 5 as low, and 9 as critically low (Table 4). Eight included the components of the PICO model (Patient/Population – Intervention – Comparison/Comparator – Outcome). Only 2 reviews explicitly noted development and registration of the protocol prior to conducting the review. A list of excluded studies and justification for their exclusion was provided in 2 reviews and partially in a third. Ten reviews conducted risk of bias assessments for the primary studies. Of those reviews, 7 accounted for risk of bias in the interpretation of results.

*Contextual review of interventions applicable to rheumatology.* Recognizing the heterogeneity of interventions, we reviewed and categorized them based on similarity of content. We identified intervention categories with potential applicability to rheumatology and created a narrative review that was discussed with the CRA HR Committee. Areas determined by the committee to warrant further exploration included physician workflow and organizational strategies, peer support and formal communication training, leadership support, and addressing mental health (eg, stress, mindfulness). Examples of specific interventions in each area and the rationale for potential applicability to rheumatology is explained in Table 5. Since none of the primary studies identified by the reviews were conducted with rheumatologists, we deemed it irrelevant to reextract and reanalyze primary study data owing to concerns about generalizability to rheumatology in addition to the low study quality.

## DISCUSSION

There is a high prevalence of burnout among rheumatologists internationally, and these rates have been increasing over recent years.<sup>10-13</sup> The CRA, global rheumatology associations, and broader healthcare systems have an interest in promoting workforce well-being and supporting initiatives to reduce burnout

Table 2. Summary of burnout interventions and metaanalysis results.

Systematic Review	Burnout Intervention(s) <sup>a</sup>	Outcomes		Comments
		Burnout Measure	Results	
De Simone 2021 <sup>27</sup>	<p>Organization-directed: rescheduling hourly shifts and reducing workload, discussion meetings to enhance teamwork and leadership, structural changes, communication skills training, mindfulness</p> <p>Physician-directed: mindfulness-based stress reduction techniques, educational interventions (self-confidence, communication skills), exercise</p>	<p>MBI</p> <p>Burnout: Pooled interventions (n = 20 studies) SMD -0.29 95% CI -0.42 to -0.16 <i>I</i><sup>2</sup> = 29%</p> <p>Organization-directed interventions (n = 8 studies) SMD -0.45 95% CI -0.62 to -0.27 <i>I</i><sup>2</sup> = 8%</p> <p>Physician-directed interventions (n = 12 studies) SMD -0.18 95% CI -0.32 to -0.04 <i>I</i><sup>2</sup> = 11%</p> <p>Depersonalization: Pooled interventions (n = 14) SMD -0.21 95% CI -0.36 to -0.07 <i>I</i><sup>2</sup> = 29%</p> <p>Organization-directed interventions (n = 3 studies) SMD -0.34 95% CI -0.66 to -0.02 <i>I</i><sup>2</sup> = 41%</p> <p>Physician-directed interventions (n = 11 studies) SMD -0.17 95% CI -0.34 to -0.01 <i>I</i><sup>2</sup> = 27%</p> <p>Personal accomplishment: Pooled interventions (n = 12 studies) SMD -0.30 95% CI -0.15 to -0.45 <i>I</i><sup>2</sup> = 0%</p> <p>Organization-directed interventions (n = 3 studies) SMD -0.32 95% CI -0.06 to -0.59 <i>I</i><sup>2</sup> = 0%</p> <p>Physician-directed interventions (n = 9 studies) SMD -0.29 95% CI -0.10 to -0.48 <i>I</i><sup>2</sup> = 0%</p>	<p>Organization-directed interventions were associated with moderate reductions in burnout whereas physician-directed interventions were associated with small reductions.</p> <p>Organization-directed interventions were also more effective at improving scores on the depersonalization and personal accomplishment domains of the MBI than physician-directed interventions.</p>	

Table 2. Continued.

Systematic Review	Burnout Intervention(s) <sup>a</sup>	Outcomes		Comments
		Burnout Measure	Results	
Panagioti 2017 <sup>28</sup>	Organization-directed: rescheduling hourly shifts and reducing workload, discussion meetings to enhance teamwork and leadership, structural changes, communication skills training, mindfulness training Physician-directed: mindfulness-based stress reduction techniques, educational interventions targeting physician self-confidence and communication skills, exercise, or a combination	MBI (or other validated measure of burnout)	Burnout: Pooled interventions (n = 20 studies) SMD -0.29 95% CI -0.42 to -0.16 <i>I</i> <sup>2</sup> = 30% Organization-directed interventions (n = 7 studies, 8 comparisons) SMD -0.45 95% CI -0.62 to -0.28 <i>I</i> <sup>2</sup> = 8% Physician-directed interventions (n = 12 studies) SMD -0.18 95% CI -0.32 to -0.03 <i>I</i> <sup>2</sup> = 11%	Burnout interventions were associated with small but significant reductions in burnout. Organization-directed interventions were more effective at reducing burnout than physician-directed interventions. A sensitivity analysis found no differences in treatment effects between studies with high and low RoB.
Ruiz-Fernández 2020 <sup>29</sup>	Mindfulness-based interventions	Various instruments were used for outcomes of stress and mindfulness; one study used self-compassion scale	Stress (n = 4 studies) SMD 0.65 95% CI 0.08 to 1.22 Effect size 2.25 <i>P</i> ≤ 0.05 <i>I</i> <sup>2</sup> = 72% Mindfulness (n = 5 studies) SMD 1.1 95% CI 0.17 to 2.04 Effect size 2.33 <i>P</i> ≤ 0.05 <i>I</i> <sup>2</sup> = 92%	Metaanalysis for stress and mindfulness showed moderate heterogeneity; results should be interpreted with caution. Overall, the evidence indicates mindfulness-based interventions can be beneficial for reducing stress in healthcare professionals.
Salvado 2021 <sup>30</sup>	Mindfulness-based interventions	MBI	Emotional exhaustion (n = 6 studies) SMD -0.54 95% CI -0.72 to -0.36 <i>I</i> <sup>2</sup> = 0% Pooled mean difference -5.89 95% CI -7.72 to -4.05 Depersonalization (n = 6 studies) SMD -0.34 95% CI -0.52 to -0.17 <i>I</i> <sup>2</sup> = 0% Pooled mean difference -1.96 95% CI -2.96 to -0.95 Personal accomplishment (n = 6 studies) SMD 0.34 95% CI 0.17 to 0.52 <i>I</i> <sup>2</sup> = 0% Pooled mean difference 2.05 95% CI 1.04 to 3.06	There was high RoB and limited study evidence, although there was low heterogeneity of pooled studies. Mindfulness-based interventions were found to have a small to moderate effect on reducing burnout symptoms.

Systematic Review	Burnout Intervention(s) <sup>a</sup>	Outcomes		Comments
		Burnout Measure	Results	
Venegas 2019 <sup>31</sup>	Facilitated physician discussion groups, mindfulness, reflection and small group learning, online self-directed microtasks, mindfulness, educational program in communication, psychosocial skills training, psychodynamic and cognitive behavioral interventions, stress management and resiliency training	MBI	Emotional exhaustion (n = 4 studies) Pooled SMD -0.67 95% CI -0.84 to -0.5 I <sup>2</sup> = 0% Depersonalization (n = 3 studies) Pooled MD -2.42 95% CI -3.80 to -1.04 I <sup>2</sup> = 0% Personal accomplishment (n = 3 studies) Pooled MD 2.47 95% CI 1.13 to 3.81 I <sup>2</sup> = 0%	Heterogeneity was high, study quality was low, RoB was serious, and evidence was weak. The 1 RCT reviewed showed nonsignificant results. Of the observational studies, modest improvement in burnout was found.
Xu 2020 <sup>32</sup>	Organization-directed: organizational improvement interventions (eg, occupational safety and wellness), staff meetings to develop and implement solutions to work stressors, telemedicine shifts and work from home, improving team coordination and streamlining workflow Physician-directed: educational interventions (communication skills training, compassion fatigue resilience education, mental health promotion, coping strategies, autogenic training), mindfulness-based interventions	MBI, Perceived Stress Scale, Professional Quality of Life Scale, Multidimensional Validated Tool	Mindfulness interventions metaanalysis (n = 2 studies) SMD -0.32 95% CI -0.84 to 0.20 I <sup>2</sup> = 0%	The results of organization-directed interventions were inconsistent with some reporting reductions in burnout and others reporting increases. All physician-directed educational interventions reported decreases in burnout. The evidence suggests physician-directed interventions may be more effective than organization-directed interventions.

<sup>a</sup> Interventions are presented in categories when grouped as such by the review authors. MBI: Maslach Burnout Index; MD: mean difference; PMD: pooled mean difference; RCT: randomized controlled trial; RoB: risk of bias; SMD: standardized mean difference.



Table 3. Summary of burnout interventions and findings from reviews in which no metaanalysis was conducted.

Review	Outcomes		Findings
	Burnout Intervention(s) <sup>a</sup>	Burnout Measure	
Bazargan-Hejazi 2021 <sup>33</sup>	Organization-directed: work hour schedule, staffing, workload Physician-directed: mindfulness exercises, group debriefing sessions, group discussion, team-based activities, exercise, role-play, self-care activities, communication skill training	NR	The majority of studies reported some level of improvement in burnout or well-being. System-directed interventions were more effective than physician-directed interventions. A metaanalysis was not performed due to the heterogeneity of interventions and their implementation settings.
Brestsi 2020 <sup>34</sup>	Mindfulness-based techniques, educational interventions (targeting communication, stress coping skills, and positive emotions empowerment), structural changes in unit management, routine staff meetings, discussion groups on ethical issues, staff motivational activities	MBI, ProQOL, Stress Response Inventory, Acceptance and Action Questionnaire Version II, Cognitive Fusion Questionnaire, Beck Depression Inventory, Post Traumatic Stress Disorder Symptom Checklist, thematic analysis with deductive approaches	The considerable heterogeneity and low quality of evidence precluded the drawing of broad conclusions. There is no clear evidence about the effectiveness of burnout interventions for specific populations of healthcare workers.
De Stio 2020 <sup>35</sup>	Collective interventions: support groups, teambuilding, debriefing sessions, reducing work hours Individually-targeted interventions: mentoring, physical activity, self-care training, 1-to-1 supervision Mindfulness-based strategies: cognitive behavioral therapy, counseling programs, psychosocial support, meditation	MBI, Perceived Stress Scale, Karasek Job Content Questionnaire, other nonvalidated questionnaires	The evidence is mixed, and many studies use nonvalidated tools to measure burnout, which makes comparisons between studies difficult. There is no consensus on which strategies are most effective and no single approach is suitable for all situations.
Dijxhoorn 2021 <sup>36</sup>	Meditation, communication training, peer-coaching, art therapy-based supervision, educational program, mindfulness program, workplace physical activity program	MBI, ProQOL, single-item burnout query, nonvalidated questionnaires	Effective interventions included communication training, peer coaching, and art therapy-based supervision. Two of 3 meditation interventions reviewed were effective at reducing burnout. The educational programs and workplace physical activity program were not effective. The improvements in burnout were small across studies.
Gray 2019 <sup>37</sup>	Communication and team building, workload and time management, skills and knowledge development, stress management, leadership development	NR	Workplace mental health interventions are vulnerable to threats to internal validity (eg, external events occurring in the hospital that affect mental health over the course of a multiweek implementation). Different conceptualizations of mental health are used across studies making comparisons difficult. Findings from burnout interventions were not reported separately from interventions targeting other aspects of mental health.
Nachrig 2021 <sup>38</sup>	Organization-directed interventions: clerical support/scribes, organizational improvement program/quality assurance System-level/policy interventions: pay for performance scheme Individual-directed interventions: mindfulness, educational training/experiential workshop, coaching Mindfulness-based interventions	NR	The considerable heterogeneity of studies precluded a metaanalysis and made it challenging to draw robust conclusions. Although burnout was an outcome measure in some of the primary studies, it was not a primary outcome for this systematic review.
Scheepers 2020 <sup>39</sup>	Mindfulness-based interventions	Variable across studies	High heterogeneity of studies noted. Nine studies reported positive effects on well-being or performance. Studies with multifaceted intervention (4-5 elements addressing mindfulness) mostly reported positive effects on well-being across diverse indicators. For more targeted interventions, risk of overestimation bias of outcomes noted for all but 1 study.

Table 3. Continued.

Review	Burnout Intervention(s) <sup>a</sup>	Outcomes	
		Burnout Measure	Findings
Taylor 2018 <sup>40</sup>	Schwartz Center Rounds Comparator interventions: action learning sets, after action reviews, Balint groups, caregiver support program, clinical supervision, critical incident stress debriefing, mindfulness-based stress reduction, peer-supported storytelling, psychosocial intervention training, reflective practice groups, resilience training	NR	Evidence for the effectiveness of Schwartz Center Rounds and comparator interventions is weak due to the heterogeneity of study designs and outcomes, as well as weak study designs.
Thomas Craig 2021 <sup>41</sup>	Time: scheduling, efficiency, and productivity Teamwork: team-based care, health information technology documentation Transitions: process improvement, workflow change Technology: adoption, implementation, optimization	MBI, proxy measures of burnout including stress and satisfaction, nonvalidated questionnaires, qualitative findings	Quality of studies was predominantly rated as low based on study design and corresponding low grades of recommendations. Most interventions targeting time, teamwork, and transitions were effective at reducing burnout. Evidence for the effectiveness of technology interventions was mixed.
van Mol 2015 <sup>42</sup>	Work schedule, educational programs and seminars, communication skills training, mindfulness, relaxation exercises, social support, individual coping strategies, changing team composition, teambuilding, job rotation, counseling	ProQOL – Revision IV Burnout subscale, ProQOL – Revision V Burnout subscale, MBI, Link Burnout Questionnaire, AVEM (Burnout pattern)	The dearth of high-quality, longitudinal experimental studies make it difficult to formulate evidence-based best practice interventions for preventing burnout among ICU staff. Metaanalysis was not possible due to heterogeneity of study designs and outcome measures.
Wiederhold 2018 <sup>43</sup>	Support group meetings, incentivized exercise program, organizational leadership program, physician control over work environment and order in clinical setting, self-administered psychotherapeutic tool, art therapy and CBT, counseling, stress management, communication skills training, mindfulness	MBI	The heterogeneity of studies makes comparison difficult. Evidence for stress management interventions is mixed, although the results from communication skills training interventions are nonsignificant. It is recommended interventions be developed at both the organization- and individual-level.

<sup>a</sup> Interventions are presented in categories when grouped as such by the review authors. AVEM: Arbeitsbezogene Verhaltens- und Erlebensmuster (Work-related behavior and experience pattern); CBT: cognitive behavioral therapy; ICU: intensive care unit; MBI: Maslach Burnout Inventory; NR: not reported; ProQOL: Professional Quality of Life Scale.

Table 4. AMSTAR 2 quality assessment.

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9.1	Q9.2	Q10	Q11.1	Q11.2	Q12	Q13	Q14	Q15	Q16	Quality
Bazargan-Hejazi 2021 <sup>33</sup>	N	Y	Y	P	Y	Y	N	N	Y	Y	N	NA	NA	NA	N	N	NA	Y	Low
Breستي 2020 <sup>34</sup>	N	N	Y	P	N	Y	N	N	NA	Y	N	NA	NA	NA	Y	Y	NA	Y	Low
De Simone 2021 <sup>27</sup>	Y	N	N	P	Y	Y	N	N	Y	NA	N	Y	NA	N	N	Y	N	Y	Critically low
Dijxhoorn 2021 <sup>36</sup>	N	P	Y	P	N	N	N	P	N	N	N	NA	NA	NA	N	Y	NA	Y	Critically low
Nachrig 2021 <sup>38</sup>	N	P	Y	P	Y	N	N	Y	Y	Y	N	NA	NA	NA	Y	Y	NA	Y	Moderate
Panagioti 2017 <sup>28</sup>	Y	P	N	P	Y	N	P	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Low
Ruiz-Fernández 2020 <sup>29</sup>	Y	N	N	P	Y	Y	N	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	Critically low
Salvado 2021 <sup>30</sup>	Y	N	Y	P	Y	N	N	P	Y	Y	N	Y	N	N	Y	Y	N	Y	Critically low
Scheepers 2020 <sup>39</sup>	Y	N	N	P	Y	Y	N	Y	N	N	N	NA	NA	NA	N	Y	NA	Y	Critically low
Taylor 2018 <sup>40</sup>	N	N	Y	P	N	N	N	P	NA	Y	N	NA	NA	NA	N	Y	NA	Y	Critically low
Thomas Craig 2021 <sup>41</sup>	Y	N	N	P	Y	Y	N	N	N	N	N	NA	NA	NA	N	Y	NA	Y	Critically low
Van Mol 2015 <sup>42</sup>	N	P	N	P	N	Y	Y	N	N	N	N	NA	NA	NA	N	N	NA	Y	Critically low
Venegas 2019 <sup>31</sup>	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Low
Wiederhold 2018 <sup>43</sup>	N	N	Y	N	Y	Y	N	P	N	N	N	NA	NA	NA	N	N	NA	Y	Critically low
Xu 2020 <sup>32</sup>	Y	P	N	Y	Y	Y	Y	Y	Y	Y	N	Y	NA	N	Y	Y	N	Y	Low

Bolded questions are critical elements considered during quality rating in the final column. Where appraisal was unclear, studies were given a rating of no for the item. AMSTAR 2 critical appraisal items: (Q1) Did the research questions and inclusion criteria for the review include the components of PICO? (Q2) Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol? (Q3) Did the review authors explain their selection of the study designs for inclusion in the review? (Q4) Did the review authors use a comprehensive literature search strategy? (Q5) Did the review authors perform study selection in duplicate? (Q6) Did the review authors perform data extraction in duplicate? (Q7) Did the review authors provide a list of excluded studies and justify the exclusions? (Q8) Did the review authors describe the included studies in adequate detail? (Q9.1) Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? (RCTs) (Q9.2) Did the review authors use a satisfactory technique for assessing the RoB in individual studies that were included in the review? (NRSIs) (Q10) Did the review authors report on the sources of funding for the studies included in the review? (Q11.1) If a metaanalysis was performed for an RCT, did the review authors use appropriate methods for statistical combination of results? (Q11.2) If a metaanalysis was performed for an NRSI, did the review authors use appropriate methods for statistical combination of results? (Q12) If a metaanalysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the metaanalysis or other evidence of synthesis? (Q13) Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review? (Q14) Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review? (Q15) If quantitative synthesis was performed, did the review authors carry out an adequate investigation of publication bias and discuss its likely impact on the results of the review? (Q16) Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review? AMSTAR: A Measurement Tool to Assess Systemic Reviews; N: no; NA: not applicable; NRSI: nonrandomized studies of interventions; P: partial; PICO: Patient/Population - Intervention - Comparison/Comparator - Outcome; Q: question; RCT: randomized controlled trial; RoB: risk of bias; Y: yes.

among its members. The healthcare provider experience is also internationally understood as part of the “quadruple aim” of high-value healthcare.<sup>45</sup> The aim of this study was to identify organization-level interventions that would be appropriate to meet this goal. In the current overview of reviews, we identified no reviews or even primary studies that were conducted in rheumatology; however, it is possible that some samples included rheumatologists alongside other physicians. Further, the existing reviews were largely of low quality. Nevertheless, upon review of the interventions to reduce burnout, some were identified as potentially relevant to rheumatologists meriting exploration in future studies.

The interventions with the highest quality evidence are mindfulness-based interventions. Traditional mindfulness-based stress reduction programs require 2.5 hours per week of group sessions for 8 consecutive weeks in addition to 45 minutes of independent daily practice.<sup>46</sup> Regarding mindfulness outcomes, a dose-response relationship is observed such that increased practice is associated with greater improvement; however, the

evidence indicating whether this relationship applies to other psychological outcomes like burnout is limited.<sup>47</sup> Brief mindfulness interventions are being explored, but evidence of their effectiveness in reducing burnout is mixed.<sup>48</sup> Given the time demands placed on rheumatologists, adapted brief mindfulness-based interventions will be more feasible to implement, especially if delivered during protected time offered through their employer. Most rheumatologists in Canada are considered self-employed, which may pose barriers to protected time for such interventions.

In addition to mindfulness-based strategies, interventions designed to reduce burnout by targeting stress and mental health were identified. These included variations of mental health counseling, psychoeducation, art therapy in a cognitive behavioral framework, and exercise programs. Given that burnout is a significant predictor of depressive symptoms, insomnia, use of psychopharmacological medications, and hospitalization for mental health concerns,<sup>49</sup> interventions that address aspects of mental health in combination with burnout

Table 5. Narrative summary of organization-level interventions to prevent physician burnout and possible applicability to rheumatology.

Category	Example Interventions	Reason for Applicability to Rheumatology
Physician workflow and organizational strategies	<ul style="list-style-type: none"> <li>Workflow changes (eg, increase visit times by 5 minutes to reduce time pressure)</li> <li>Off-load nonessential tasks (eg, medical assistants entering data into EHR)</li> <li>Optimize office design efficiency, including standardization of medical equipment, supplies, and health education materials in patient examination rooms</li> <li>Using EHR-based text paging system to communicate</li> </ul>	<ul style="list-style-type: none"> <li>High complexity of patients</li> <li>High volume of data entry (joint counts, comorbidities, symptoms, medications)</li> <li>Potential for increased efficiency especially in multipractice sites</li> <li>Reduced disruption by pagers for a generally outpatient-based specialty</li> </ul>
Peer support and formal communication training	<ul style="list-style-type: none"> <li>Communication training</li> <li>Group discussions of personal challenges, shared experiences, or difficult care management</li> <li>Complex care rounds for complex/concerning cases</li> </ul>	<ul style="list-style-type: none"> <li>Necessary for relaying care complexities to patients, families, and members of the interprofessional teams</li> <li>Poor patient outcomes and deaths in rheumatology may take a toll on providers and reviewing experiences and feelings may be helpful</li> <li>Complex cases are common in the specialty and group discussion to share experiences may be necessary to provide the best care decisions and reduce individual physician burden of decision making</li> </ul>
Leadership support	<ul style="list-style-type: none"> <li>Clinical site meetings to emphasize clinical over administrative issues</li> <li>Regular group meetings to elicit physician concerns</li> <li>Specific physician interests valued through work options and case-mix adjustment</li> <li>Involve employees in decision making to improve communication with management staff and occupational safety and wellness</li> <li>Employee working groups to improve communication and cooperation</li> </ul>	<ul style="list-style-type: none"> <li>Particularly helpful for multiphysician practices and academic rheumatology sites</li> </ul>
Addressing stress, mental health, and mindfulness	<ul style="list-style-type: none"> <li>Mindfulness-based (eg, MBSR, MBCT) groups and courses offered through professional development programs</li> <li>Art therapy group</li> <li>Individual clinical supervision with a clinical psychologist to manage emotional demands of work</li> <li>Counseling sessions with a mental health professional</li> <li>Exercise programs with team-based incentives (eg, providing free access to the workplace exercise facility)</li> <li>Psychoeducation sessions on topics such as team building, communication skills, self-esteem, and stress management</li> </ul>	<ul style="list-style-type: none"> <li>If facilitated at the organizational level with protected time for rheumatologist attendance, psychoeducation and therapeutic interventions provided to small groups and individuals may be adaptable for rheumatology</li> <li>Different strategies may be more effective for different individuals</li> </ul>

EHR: electronic health record; MBCT: mindfulness-based cognitive therapy; MBSR: mindfulness-based stress reduction.

may be valuable in the prevention and management of more severe psychological symptoms. Although such interventions may be beneficial for rheumatologists, further study is needed as the current evidence is sparse, low quality, and not tailored to rheumatology.

We also identified physician workflow and organization strategies, as well as peer support and formal communication training strategies that may be uniquely beneficial to rheumatologists. Rheumatology is primarily an outpatient-based specialty. Rheumatologists often follow patients for life as a result of the complex and chronic nature of many rheumatic diseases and their corresponding treatments. This can lead to challenges in managing workflows and access to care. A shortage of rheumatologists regionally may compound access issues and physician burnout. Further, there can be high volumes of administrative

work necessary to access medications and monitor complex multisystem diseases. Several interventions identified in our review could be investigated further for their effect on rheumatologist burnout, including offloading tasks where possible to nonphysicians such as medical assistants or scribes. Time spent on tasks which could or should be performed by others was found to be associated with burnout in a sample of hospitalists.<sup>50</sup> Indeed, some evidence exists that the use of scribes in rheumatology improved clinic workflow and physician satisfaction, although burnout was not examined as an outcome.<sup>51</sup> Although not directly captured in our review, EHR optimization strategies may also decrease burnout. However, a recent scoping review on this topic published after our search was completed found only 2 studies that used team-based interventions to improve burnout symptoms related to electronic

medical records, and these studies did not demonstrate significant improvement in burnout scores.<sup>52</sup> Further research on ways to reduce EHR-related burnout are urgently needed. Last, because of the complexity of rheumatology care, it may also be reasonable to consider increasing the duration of appointments to reduce time pressure for evaluation. However, hiring scribes or increasing appointment times are associated with costs to the individual physician in most models of community-based rheumatology care, and therefore these strategies do not adequately target organizational or structural factors related to burnout.

Rheumatologists may also encounter rare and complex cases, which can contribute to stress. In a series of interviews, complex patients were identified as a factor that might have a negative emotional effect and contribute to burnout among family physicians.<sup>53</sup> Given that rheumatologists are often one of the professionals collaborating on the medical team alongside family physicians for these complex patients, it stands to reason that they may experience similar negative mental health effects. Opportunities for peer support through group discussions and complex care rounds offer a way to mitigate the psychological effects of working with complex cases, poor patient outcomes and deaths, and the burden of individual rheumatologist decision making.

Using the AMSTAR 2 tool,<sup>26</sup> the quality of systematic reviews in our study was generally found to be low. Further, metaanalyses were rarely conducted because the heterogeneity of the primary studies was too great. Six of the studies we reviewed included metaanalyses.<sup>27-32</sup> Yet, even among those using the same instrument to assess burnout (ie, the MBI), comparison is difficult. This is because some metaanalyses used the overall burnout score,<sup>27,28,32</sup> whereas others reported on 1 or more of the subscales<sup>27,30,31</sup> (ie, depersonalization, emotional exhaustion, personal accomplishment). Across reviews, the factors contributing to heterogeneity included variability in study designs, populations and inclusion criteria, definitions of burnout, instruments for measuring burnout, and conceptualizations of physician-directed and organization-directed interventions. The lack of consensus for whether a particular type of intervention (eg, mindfulness training) qualified as physician-directed or organization-directed also presented a challenge. Overall, there has been a significant amount of research exploring strategies to reduce burnout among healthcare providers, but the evidence is difficult to synthesize, and the quality is low. In future, the quality of the systematic reviews on this topic could be improved through adherence to AMSTAR 2 reporting criteria. Although not formally addressed in our study, primary studies should also adhere to rigorous standards for design, conduct, and transparency of reporting. We recommend consistent use of well validated burnout measures and powering studies adequately to examine subpopulations of interest.

It is worth noting that the heterogeneity of interventions indicates there are multiple opportunities to influence the factors that contribute to burnout. Diverse avenues exist for future investigations of interventions to reduce burnout in rheumatologists. At present, there are ongoing groups and activities around Canada to support physician wellness. The CRA HR

Committee completed a review of resources and found that the onus is typically placed on the physician to seek out and engage in supports as opposed to organizations implementing system-level strategies. For example, Well Doc Alberta (<https://www.welldocalberta.org>) offers psychoeducation and preventive strategies to support physician mental health. Yet, accessing the website, reviewing the materials, and practicing the interventions takes time and is unlikely to be integrated into a rheumatologist's typical workday. Engagement in these activities during the workday may negatively affect clinical volume and consequent remuneration in traditional fee-for-service models.

This study has limitations. As previously mentioned, there were inconsistencies between reviews in their categorization of the same interventions as organization-directed or physician-directed. Further, it was difficult to make comparisons between reviews because of heterogeneity. The proportion of physician participants in the reviews was not always clearly reported, and it is possible some study findings were less generalizable to physicians. Our review focused also on the outcome of burnout; other outcomes such as depression or anxiety may be equally important and could be considered in future reviews. The low quality of systematic reviews indicates this body of literature should be interpreted with caution. We had planned to complete a Delphi consensus procedure with the CRA HR Committee to further refine potentially relevant interventions; however, this was not done because of the heterogeneity and low levels of evidence of the studies. Despite these limitations, our study had several strengths. We prioritized breadth in our search, considered overlapping primary studies, and maximized inclusion of any potentially relevant interventions. Thus, we are confident we captured and reviewed all interventions that may have utility at an organizational level. In addition, we adopted a pragmatic lens to consider what might be applicable to rheumatologists across Canada, given the unique demands of this specialty.

To our knowledge, there has been no research investigating organization-directed interventions to prevent burnout or reduce burnout in rheumatologists. The results from our overview of reviews indicate that although there has been a notable number of studies implementing interventions to prevent burnout in broader physician and healthcare provider populations, the quality of evidence is low. This is largely a result of heterogeneity; thus, to grow this body of knowledge, consistency across methodological elements such as operationalization of burnout, assessment methods, and intervention design is critical for future studies to consider. Despite the low quality of the evidence, there have been encouraging findings that indicate several interventions with potential applicability to rheumatologists. Future work should focus on interventions that address physician workflow; organizational strategies; peer support and formal communication training; leadership support; and addressing stress, mental health, and mindfulness.

#### ONLINE SUPPLEMENT

Supplementary material accompanies the online version of this article.



## REFERENCES

1. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organiz Behav* 1981;2:99-113.
2. World Health Organization. ICD-11 for Mortality and morbidity Statistics. [Internet. Accessed July 28, 2023.] Available from: <https://icd.who.int/browse11>
3. Frajerman A, Morvan Y, Krebs MO, Gorwood P, Chaumette B. Burnout in medical students before residency: a systematic review and meta-analysis. *Eur Psychiatry* 2019;55:36-42.
4. Rodrigues H, Cobucci R, Oliveira A, et al. Burnout syndrome among medical residents: A systematic review and meta-analysis. *PLoS One* 2018;13:e0206840.
5. Rotenstein LS, Torre M, Ramos MA, et al. Prevalence of burnout among physicians: a systematic review. *JAMA* 2018;320:1131-50.
6. Shanafelt TD, West CP, Sinsky C, et al. Changes in burnout and satisfaction with work-life integration in physicians and the General US Working population between 2011 and 2017. *Mayo Clin Proc* 2019;94:1681-94.
7. Claponea RM, Pop LM, Iorga M, Iurcov R. Symptoms of burnout syndrome among physicians during the outbreak of COVID-19 pandemic-a systematic literature review. *Healthcare* 2022;10:979.
8. Claponea RM, Iorga M. Burnout, organizational justice, workload, and emotional regulation among medical and non-medical personnel working in Romanian healthcare units. *Behav Sci* 2023;13:225.
9. Tiwari V, Kavanaugh A, Martin G, Bergman M. High burden of burnout on rheumatology practitioners. *J Rheumatol* 2020; 47:1831-4.
10. Kulhawy-Wibe SC, Widdifield J, Lee JY, et al. Results from the 2020 Canadian Rheumatology Association's workforce and wellness survey. *J Rheumatol* 2022;49:635-43.
11. Intriago M, Maldonado G, Soriano E, Toro C, Moreno L, Ríos C. Burnout in rheumatologists in Latin America. *J Clin Rheumatol* 2022;28:1-6.
12. Khurshheed T, Sharif M, Khan MS, et al. Burnout in South Asian rheumatologists in the COVID-19 pandemic: an online survey. *Rheumatol Int* 2023;43:1143-50.
13. Collins TR. Medscape survey suggests 50% of rheumatologists experience burnout. [Internet. Accessed August 1, 2023.] Available from: <https://www.the-rheumatologist.org/article/medscape-survey-suggests-50-of-rheumatologists-experience-burnout/>
14. Kane L. 'Death by 1000 Cuts': Medscape national physician burnout and suicide report 2021. [Internet. Accessed June 29, 2021.] Available from: <https://www.medscape.com/slideshow/2021-lifestyle-burnout-6013456#1>
15. Martin KL, Koval ML. Medscape rheumatologist lifestyle, happiness and burnout report 2021. [Internet. Accessed June 29, 2021.] Available from: <https://www.medscape.com/slideshow/2021-lifestyle-rheumatologist-6013525#3>
16. Yan Q, Jiang Z, Harbin Z, Tolbert PH, Davies MG. Exploring the relationship between electronic health records and provider burnout: a systematic review. *J Am Med Inform Assoc* 2021;28:1009-21.
17. Widdifield J, Gatley JM, Pope JE, et al. Feminization of the rheumatology workforce: A longitudinal evaluation of patient volumes, practice sizes, and physician remuneration. *J Rheumatol* 2021;48:1090-7.
18. Pooni R, Ronis T, Lee T; CARRA Investigators. Telemedicine use by pediatric rheumatologists during the COVID-19 pandemic. *Pediatr Rheumatol Online J* 2021;19:93.
19. Kumar B, Sweet ML, Sunjia M, Iyer P. Well-being, burnout, and resiliency among early-career rheumatologists: a qualitative study. *J Clin Rheumatol* 2021;27:e404-11.
20. Reith TP. Burnout in United States healthcare professionals: a narrative review. *Cureus* 2018;10:e3681.
21. Hodkinson A, Zhou A, Johnson J, et al. Associations of physician burnout with career engagement and quality of patient care: systematic review and meta-analysis. *BMJ* 2022;378:e070442.
22. Kilian A, Upton LA, Battafarano DF, Monrad SU. Workforce trends in rheumatology. *Rheum Dis Clin North Am* 2019;45:13-26.
23. Miloslavsky EM, Bolster MB. Addressing the rheumatology workforce shortage: a multifaceted approach. *Semin Arthritis Rheum* 2020;50:791-6.
24. Veritas Health Innovation. Covidence systematic review software. Melbourne, Australia: 2022.
25. Pollock M, Fernandes RM, Pieper D, Hartling L. Chapter 5: overviews of reviews. In: *Cochrane Handbook for Systematic Reviews of Interventions*. Version 6.3. Cochrane; 2022. [Internet. Accessed August 9, 2023.] Available from: <https://training.cochrane.org/handbook/current/chapter-v>
26. Shea BJ, Reeves BC, Wells G, et al. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ* 2017;358:j4008.
27. De Simone S, Vargas M, Servillo G. Organizational strategies to reduce physician burnout: a systematic review and meta-analysis. *Aging Clin Exp Res* 2021;33:883-94.
28. Panagioti M, Panagopoulou E, Bower P, et al. Controlled interventions to reduce burnout in physicians: a systematic review and meta-analysis. *JAMA Intern Med* 2017;177:195-205.
29. Ruiz-Fernández MD, Ortíz-Amo R, Ortega-Galán ÁM, Ibáñez-Masero O, Rodríguez-Salvador MDM, Ramos-Pichardo JD. Mindfulness therapies on health professionals. *Int J Ment Health Nurs* 2020;29:127-40.
30. Salvado M, Marques DL, Pires IM, Silva NM. Mindfulness-based interventions to reduce burnout in primary healthcare professionals: a systematic review and meta-analysis. *Healthcare* 2021;9:1342.
31. Venegas CL, Nkangu MN, Duffy MC, Fergusson DA, Spilg EG. Interventions to improve resilience in physicians who have completed training: a systematic review. *PLoS One* 2019;14:e0210512.
32. Xu HG, Kynoch K, Tuckett A, Eley R. Effectiveness of interventions to reduce emergency department staff occupational stress and/or burnout: a systematic review. *JBIM Evid Synth* 2020;18:1156-88.
33. Bazargan-Hejazi S, Shirazi A, Wang A, et al. Contribution of a positive psychology-based conceptual framework in reducing physician burnout and improving well-being: a systematic review. *BMC Med Educ* 2021;21:593.
34. Bresesti I, Folgiori L, De Bartolo P. Interventions to reduce occupational stress and burn out within neonatal intensive care units: a systematic review. *Occup Environ Med* 2020;77:515-9.
35. De Sio S, Buomprisco G, Perri R, et al. Work-related stress risk and preventive measures of mental disorders in the medical environment: an umbrella review. *Eur Rev Med Pharmacol Sci* 2020;24:821-30.
36. Dijkhoorn AQ, Brom L, van der Linden YM, Leget C, Raijmakers NJ. Prevalence of burnout in healthcare professionals providing palliative care and the effect of interventions to reduce symptoms: a systematic literature review. *Palliat Med* 2021;35:6-26.
37. Gray P, Senabe S, Naicker N, Kgalamono S, Yassi A, Spiegel JM. Workplace-based organizational interventions promoting mental health and happiness among healthcare workers: a realist review. *Int J Environ Res Public Health* 2019;16:4396.
38. Naehrig D, Schokman A, Hughes JK, Epstein R, Hickie IB, Glozier N. Effect of interventions for the well-being, satisfaction and flourishing of general practitioners-a systematic review. *BMJ Open* 2021;11:e046599.

39. Scheepers RA, Emke H, Epstein RM, Lombarts KMJMH. The impact of mindfulness-based interventions on doctors' well-being and performance: a systematic review. *Med Educ* 2020;54:138-49.
40. Taylor C, Xyrichis A, Leamy MC, Reynolds E, Maben J. Can Schwartz Center Rounds support healthcare staff with emotional challenges at work, and how do they compare with other interventions aimed at providing similar support? A systematic review and scoping reviews. *BMJ Open* 2018;8:e024254.
41. Thomas Craig KJ, Willis VC, Gruen D, Rhee K, Jackson GP. The burden of the digital environment: a systematic review on organization-directed workplace interventions to mitigate physician burnout. *J Am Med Inform Assoc* 2021;28:985-97.
42. van Mol MM, Kompanje EJ, Benoit DD, Bakker J, Nijkamp MD. The prevalence of compassion fatigue and burnout among healthcare professionals in intensive care units: a systematic review. *PLoS One* 2015;10:e0136955.
43. Wiederhold BK, Cipresso P, Pizzioli D, Wiederhold M, Riva G. Intervention for physician burnout: a systematic review. *Open Med* 2018;13:253-63.
44. Canadian Institutes of Health Research. Transforming health with integrated care (THINC): areas of focus and essential elements. [Internet. Accessed July 28, 2023.] Available from: <https://cihr-irsc.gc.ca/e/53008.html>
45. Sikka R, Morath JM, Leape L. The Quadruple Aim: care, health, cost and meaning in work. *BMJ Qual Saf* 2015;24:608-10.
46. Carmody J, Baer RA. How long does a mindfulness-based stress reduction program need to be? A review of class contact hours and effect sizes for psychological distress. *J Clin Psychol* 2009; 65:627-38.
47. Strohmaier S. The relationship between doses of mindfulness-based programs and depression, anxiety, stress, and mindfulness: a dose—response meta-regression of randomized controlled trials. *Mindfulness* 2020;11:1315-35.
48. Gilmartin H, Goyal A, Hamati MC, Mann J, Saint S, Chopra V. Brief mindfulness practices for healthcare providers – a systematic literature review. *Am J Med* 2017;130:1219.e1-1219.e17.
49. Salvagioni DAJ, Melanda FN, Mesas AE, González AD, Gabani FL, Andrade SM. Physical, psychological and occupational consequences of job burnout: a systematic review of prospective studies. *PLoS One* 2017;12:e0185781.
50. Stokes SB, Kanwar R, Jain S, Adapa K, Meltzer-Brody S, Mazur L. Hospitalist burnout and sociotechnical factors contributing to workplace stress. *ISE Industrial and Systems Engineering at Work* 2021;53:28-33.
51. Danila MI, Melnick JA, Curtis JR, Menachemi N, Saag KG. Use of scribes for documentation assistance in rheumatology and endocrinology clinics: impact on clinic workflow and patient and physician satisfaction. *J Clin Rheumatol* 2018;24:116-21.
52. Li C, Parpia C, Sriharan A, Keefe DT. Electronic medical record-related burnout in healthcare providers: a scoping review of outcomes and interventions. *BMJ* 2022;12:e060865.
53. Roskos SE, Fitzpatrick L, Arnetz B, Arnetz J, Shrotriya S, Hengstebeck E. Complex patients' effect on family physicians: high cognitive load and negative emotional impact. *Fam Pract* 2021;38:454-9.