OPEN ACCESS

Research Article

Recall, precision, and coverage of literature searches in systematic reviews in occupational medicine: an overview of Cochrane Reviews

Recall, Precision und Coverage von Literatursuchen in systematischen Reviews aus dem Bereich Arbeitsmedizin: Ein Überblick über Cochrane Reviews

Sebastian Straube[1]
Judith Heinz[2]
Patrick Landsvogt[2]
Tim Friede[2]

1 Division of Preventive Medicine, Department of Medicine, University of Alberta, Edmonton, Canada

2 Department of Medical Statistics, University Medical Center Göttingen, Germany

Abstract

Background: Most of relevant studies for a systematic review are identified via electronic searches of biomedical databases, of which MEDLINE is arguably the most important. As search strategies may vary in complexity and yield, we aimed to assess MEDLINE search strategies regarding their recall, precision, and coverage in a sample of Cochrane Reviews in occupational medicine.
Methods: Overall, we replicated and analysed search strategies of 42 Cochrane Reviews published between 2001 and 2017.
Results: We found a median precision of 1.5% and a median recall of 83% which may act as benchmarks for a MEDLINE search strategy in systematic reviews in occupational medicine.
Conclusion: These benchmarks for reviews in occupational medicine may help to find a balance between recall and precision of search strategies. They will be helpful for researchers to plan their work load required for reviews.

Keywords: systematic reviews, literature search, recall, precision, coverage, occupational medicine

Zusammenfassung

Hintergrund: Die meisten relevanten Studien für einen systematischen Review werden über die elektronische Suche in biomedizinischen Datenbanken identifiziert, von denen MEDLINE wohl eine der wichtigsten ist. Da die Komplexität und das Ergebnis von Suchstrategien variieren können, wollten wir die MEDLINE-Suchstrategien in einer Stichprobe von Cochrane Reviews aus dem Bereich der Arbeitsmedizin hinsichtlich Recall, Precision und Coverage bewerten.
Methoden: Insgesamt haben wir die Suchstrategien von 42 Cochrane Reviews, welche zwischen 2001 und 2017 veröffentlicht wurden, repliziert und analysiert.
Ergebnisse: Wir fanden eine mediane Precision von 1,5% und einen medianen Recall von 83%, die als Benchmark für eine MEDLINE-Suchstrategie in systematischen Übersichtsarbeiten in der Arbeitsmedizin dienen können.
Schlussfolgerung: Diese Benchmarks für Reviews in der Arbeitsmedizin können dazu beitragen, ein Gleichgewicht zwischen Recall und Precision von Suchstrategien zu finden. Sie können außerdem hilfreich sein, um den Arbeitsaufwand für systematische Reviews zu planen.

Schlüsselwörter: systematische Reviews, Literatursuche, Recall, Precision, Coverage, Arbeitsmedizin

Background

Systematic reviews aim to collate and analyze all the relevant studies for the topic in question. Potentially eligible studies, which, if included, are later scrutinized, are identified by means of electronic database searching, typically in a number of biomedical databases, of which MEDLINE is arguably the most important. While systematic reviews will now employ a range of methods to identify studies for inclusion, electronic database searching, specifically in MEDLINE, remains the most important search method. MEDLINE search strategies vary greatly among systematic reviews, in length, structure, complexity, and yield.

We aimed to address the question of how good these MEDLINE search strategies are in systematic reviews in occupational medicine. We investigated three measures that allow for an assessment of the MEDLINE search strategies: *recall*, i.e. the ability of the search strategy to identify the relevant MEDLINE indexed studies (the MEDLINE indexed studies that are included in the review), *precision*, the ability of the search strategy to identify the relevant included studies relative to the overall number of database records that the search strategy generates, and *MEDLINE coverage*, a measure for the ability to find relevant references through MEDLINE only (i.e. the proportion of included studies that are indexed in MEDLINE). Furthermore, we introduce the *search specific coverage* as a measure for the ability of the specific MEDLINE search strategy in question to identify the relevant studies (i.e. the proportion of included studies that are retrieved by the specific MEDLINE search strategy in question). The measures recall and precision are equivalent to the well-known diagnostic criteria sensitivity and specificity.

Ideally, search strategies would find all the relevant studies and not return any other studies that, on closer inspection, are revealed to not be relevant to the review. While this ideal in its absolute form is generally not practical, aiming for a reasonably high recall and precision is important to balance the amount of work and quality of systematic reviews. Further, an assessment of the quality of search strategies can be made by benchmarking to systematic reviews of a known high standard, such as Cochrane Reviews.

We therefore chose as the sample for our investigation of recall, precision, MEDLINE coverage, and search specific coverage in systematic reviews in occupational medicine the Cochrane Reviews in the sub-topic of "management of occupational disease" of the topic "health & safety at work" in the Cochrane Database of Systematic Reviews (CDSR).

Methods

Selection of systematic reviews and data extraction

A convenience sample of systematic reviews for the replication and assessment of the search strategy, but arguably with relevance for the whole field, was derived from the CDSR. For our investigation, we screened all available systematic reviews for the topic "health and safety at work" in the category of "management of occupational disease". We included all such Cochrane Reviews which provided a replicable search strategy and which listed all included studies. Reviews at the protocol stage and reviews withdrawn from the CDSR were excluded from our present analysis. Our last search for eligible Cochrane Reviews was performed in October 2017 (https://www.cochranelibrary.com).

Data on the investigated disorders, the search strategy employed in the Cochrane Reviews and the included references with and without MEDLINE unique identifier (uid) were extracted. Reasons for absent uid were determined, if not stated in the reference list of the Cochrane Reviews, via a National Library of Medicine (NLM) Catalog search, via trial registries (ClinicalTrials.gov, ISRCTN, EU-CTR) or via a Google search. The investigated disorders were categorized as follows: 'hearing disorders', which comprises noise-induced hearing loss and tinnitus, 'carpal tunnel syndrome', 'other musculoskeletal disorders', including back pain and neck and limb disorders, and 'other disorders', which includes infectious disease, mental health disorders, poisoning, respiratory tract disorders, and dermatitis.

Replication of the search strategy of the Cochrane Reviews

For our investigation the original MEDLINE search strategy was replicated (by PL) via PubMed or OVID according to the syntax given in the Cochrane Review in question. If the search strategy was provided as OVID syntax, the search was run in OvidSP. All replicated searches were verified by another author (JH) for conformity with the original searches and plausibility.

Analysis

To test the quality of the MEDLINE search strategy of the included Cochrane Reviews the *Inquisitio Validus Index Medicus* method employing *recall* as search validation was applied [1]. This recall is a measure of the ability of a MEDLINE search strategy to identify the relevant studies that are indexed in MEDLINE. In this known-item search the MEDLINE-indexed included references of the original systematic review were used as 'all relevant studies'. *Recall* was calculated as the number of included studies of the Cochrane Review that were retrieved in the replicated MEDLINE search divided by the number of all

MEDLINE-indexed included studies in the Cochrane Review in question.

$$\text{Recall} = \frac{\text{Included studies retrieved by MEDLINE search}}{\text{All studies index in MEDLINE that are included in the review}}$$

A second measure, *precision,* was employed to assess the effectiveness of the search strategy. This was calculated as the number of included studies that were retrieved in the replicated MEDLINE search divided by the total number of search results generated by the replicated MEDLINE search strategy.

$$\text{Precision} = \frac{\text{Included studies retrieved by the MEDLINE search}}{\text{Overall records retrieved by the MEDLINE search}}$$

Coverage is a measure that assesses to which extent relevant references can be identified by searching only in MEDLINE [2]. This *coverage* – in the following text called *MEDLINE coverage* – was calculated as the number of included studies of the Cochrane Review indexed in MEDLINE divided by the number of all included studies of the Cochrane Review.

$$\text{MEDLINE coverage} = \frac{\text{Included studies indexed in MEDLINE}}{\text{All studies included in the review}}$$

Furthermore, we here introduce the *search specific coverage* as a new measure describing to which extent the included references where identified through the MEDLINE search strategy. Specifically, the following formula was used:

$$\text{Search specific coverage} = \frac{\text{Included studies retrieved by the specific MEDLINE search}}{\text{All studies included in the review}}$$

The *search specific coverage* is always smaller than or equal to the *MEDLINE coverage*.

Descriptive statistics (median and 10–90 percentile) were calculated for *precision*, *recall*, *search specific coverage*, and *MEDLINE coverage* for each Cochrane Review and by disorder category. Further, the *overall precision, overall recall, overall search specific coverage*, and *overall MEDLINE coverage* were also calculated. The correlation between recall and precision of the MEDLINE search strategies as well as between search specific coverage and precision was analyzed by Spearman's rank test (Spearman R and 95% Confidence Interval (CI); SAS 9.4, SAS Institute Inc. All).

Results

Overall, we analyzed the search strategies in 42 Cochrane Reviews, published between 2001 and 2017. Figure 1 illustrates our strategy for identifying the relevant Cochrane Reviews for our overview and reasons for excluding reviews.

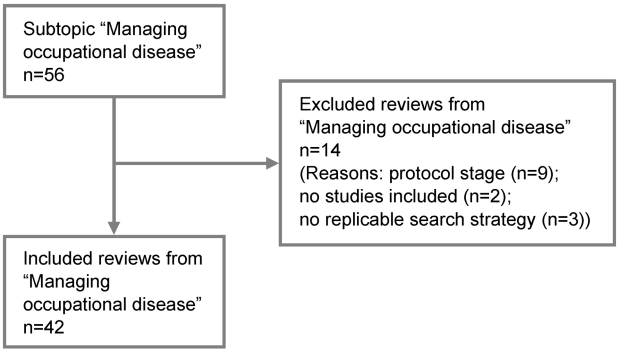

Figure 1: Study identification from the Cochrane Database of Systematic Reviews

The health condition that has been investigated in the respective Cochrane Review and the access to MEDLINE for the literature search as well as other characteristics of the reviews are presented in Attachment 1.

Attachment 2 shows extracted data on references (included studies) of the Cochrane Reviews and the results of our analysis of recall, precision, MEDLINE coverage, and search specific coverage.

The Cochrane Reviews included between zero and 54 studies with a uid (mean 12.3), and between zero and seven studies without a uid (mean 1.7). The included studies without a uid are detailed in Table 1; six of these studies could be found in PubMed but not in Ovid MEDLINE (and we used either PubMed or Ovid MEDLINE to replicate the searches, in line with what had been described in the Cochrane Review in question).

Table 1: References without uid in the Cochrane Reviews (n=72)

Reason for not having a uid	n
Journal not indexed in MEDLINE	49
Journal indexed, but publication not found	4
Thesis or report	5
Conference contribution	5
Clinical trial registry	3
No hit in OVID (but in PubMed)	6

uid – unique MEDLINE identifier

The overall precision, recall, search specific coverage, and MEDLINE coverage were 0.9%, 78%, 69%, and 88%, respectively (Attachment 2). As shown in Table 2, the median precision was 1.5%, the median recall was 83%, the median search specific coverage was 74%, and the median MEDLINE coverage was 93%.

Categorizing the Cochrane Reviews by disorder illustrates that there is some variability between the reviews.

We further investigated the relationship between recall and precision of the MEDLINE search strategies as well as between search specific coverage and precision and found no statistically significant correlations (Spearman R =0.232 (95% CI, –0.082 to 0.503) and R=0.193 (95% CI, –0.118 to 0.469)).

Table 2: Median (percentile 10–90) precision, recall, search specific coverage, and MEDLINE coverage of the reviews by disorder

	Precision (%)	Recall (%)	Search specific coverage (%)	MEDLINE coverage (%)
All reviews (n=42)	1.5 (0,1–12,5)	83 (50–100)	74 (25–100)	93 (69–100)
By disorder				
Hearing disorder (n=9)	1.2 (0.3–5.6)	100 (67–100)	83 (50–100)	100 (69–100)
Carpal tunnel syndrome (n=9)	7.2 (0.17–17.3)	100 (75–100)	75 (68–100)	86 (73–100)
Other musculoskeletal disorders (n=9)	3.8 (0,03–22.4)	78 (4,2–100)	73 (3,8–90)	92 (85–100)
Other disorders (n=15)	0.3 (0–1,9)	73 (0–100)	70 (0–94)	100 (25-100)

Discussion

The median precision of 1.5%, the median recall of 83%, the median MEDLINE coverage of 93% and the median search specific coverage of 74% may serve as benchmarks for systematic reviews in occupational medicine, as we are not aware of other studies attempting such an analysis in this subspecialty. The knowledge that screening 100 database records will yield just one eligible study allows for an estimation of the work involved in conducting a systematic review in occupational medicine based on the number of hits in MEDLINE. If indeed our results are a generally applicable approximation for systematic reviews in occupational medicine, this knowledge will allow researchers to plan their work and estimate the person-power required for reviews, which may also be helpful for grant applications. This knowledge may provide a rational for performing a first comprehensive search early in the process of review writing, perhaps even at the stage of applying for a research grant. Along the same lines, it may also be something funders might in future request of research teams who propose to perform systematic reviews as part of a budget justification.

Though we are not aware of a previous analysis like this in occupational medicine, more broadly speaking, our findings can be compared with what others have reported. Sampson and McGowan pioneered the idea of calculating recall as a means of validating a MEDLINE search; they examined 6 Cochrane Reviews and calculated an overall recall of 58% and a median recall of 46% [1]. In another publication, Sampson and colleagues [3] calculated the precision for 94 reviews and found the median precision to be 2.9%, with a range of 0.7% to 35.8%. Bramer and colleagues [2] analyzed searches from 120 systematic reviews and reported an overall recall of 72.6% for MEDLINE as well as an overall precision of 2.8%; they also found that MEDLINE alone achieved 92.3% overall coverage, which is comparable to our "MEDLINE coverage" in the field of occupational medicine as a sub-specialty.

Overall, and the finding of some reviews with low recall and low precision notwithstanding, one might expect an inverse relationship between recall and precision, although the Spearman correlation was not significant.

At the one extreme, a search strategy encompassing all of MEDLINE would necessarily find all included studies that are indexed in MEDLINE, but have an extremely low precision. A review with a much focussed search strategy on the other hand would have a high precision, but typically at the expense of not detecting all relevant studies that are indexed in MEDLINE. Where along this spectrum is the optimum, in general and for a systematic review in occupational medicine?

An argument might be made for a general default of accepting low precision for the promise of high recall, but the matter may not be as simple as that, for the following reasons. The screening of large numbers of database records might overwhelm research teams, steering them away from otherwise attractive review projects. Having to screen large numbers of hits might also lead to deviations from the methodologically highest systematic review standards of independent duplication of the screening step by two reviewers to preserve time, such as by employing screening by one reviewer only or even by having several single reviewers screen non-overlapping sections of the search results where these reviewers might be inconsistent in their application of the study eligibility criteria. Moreover, having to screen a large number of hits could result in more cursory screening by reading abstracts less thoroughly or by deliberately only reading titles and not abstracts. Further, having to screen a large number of database records from one database might lead to a decision of limiting the other components of the search (other databases, non-electronic searching) for time and resource reasons, making the overall search less comprehensive. Finally, another consideration is fatigue and loss of interest and engagement with the subject matter as a result of the monotony of spending long periods of time screening abstracts on a computer screen. All these factors could lead to eligible studies being missed in the screening process. Therefore, a balance between recall and precision needs to be stuck and that balance might not be the same for different fields of study – hence there is a need for benchmarking with regard to recall and precision in different medical specialties. What the benchmark should be is of course a subject that could be discussed at length, but that would be beyond the scope of this publication; the approach of taking Cochrane Reviews as the 'gold standard' has appealed to the authors – there would have been other answers to the question as to what should be the benchmark [4]. Recently, Franco et al. reported that in about 70% of a random sample of Cochrane Reviews problems in the design

of search strategies are present and half of these problems may limit recall and precision of the search strategies [5]. In addition to the specifics of the search strategy, the combination of bibliographic databases used in a systematic review needs to be considered. Bramer et al. [6] estimate that 60% of systematic reviews do not retrieve their chosen threshold of 95% of the relevant references. Bramer et al. argue that searching the databases MEDLINE, EMBASE, Web of Science, and Google Scholar would be a 'minimum requirement' for an adequate and efficient coverage of the literature. Depending on the field of study, there may be greater or lesser utility in going beyond standard biomedical database searching. For example, for the topic of health effects of environmental enhancement and conservation activities, supplementary search methods (e.g. contacting organisations and searching websites) were described as valuable [7].

As occupational medicine is a comparably small field within medicine with a relative dearth of high quality trials for a number of clinically important questions, a logical approach would be to accept a low precision for the promise of capturing all or nearly all relevant studies, the limitations outlined above notwithstanding. In other fields, where there is an abundance of high quality trials addressing the clinical questions of interest, the balance between precision and recall may be different and it may make sense to aim at higher precision with the search strategies to contain the overall effort needed for conducting the systematic review.

Further, occupational medicine is a discipline where different terms and phrases may be used in different jurisdictions to describe the same or related concepts. Contrast this with the search for trials on pharmaceutical interventions, especially when based on drug names. The precision can be expected to be higher in the latter compared to the former, for the same recall.

Some limitations of our analysis need to be considered. There was considerable variability between the Cochrane Reviews – as shown in Attachment 2 and Table 2: it is not clear if the variability between investigated disorders is due to differences in the subject matter or difference between author teams. This would need to be explored in more extensive future studies. Further, we focussed on the management of occupational diseases, and the generalizability of our conclusions to other fields within occupational medicine will need to be confirmed.

Conclusion

The parameters estimated in this article – i.e. that screening 100 database records would yield about one eligible study and that about 83% of the relevant MEDLINE-indexed studies and about 74% of all relevant studies for a systematic review would be identified via a MEDLINE search – may help researchers find a balance between recall and precision of search strategies. These benchmarks for systematic reviews in occupational medicine may further be helpful for researchers in estimating the workload required for such systematic reviews and in determining what additional searching and resources they wish to employ.

Abbreviations

- CDSR: Cochrane Database of Systematic Reviews
- uid: unique MEDLINE identifier
- NLM: National Library of Medicine
- ISRCTN: International Standard Registered Clinical/soCial sTudy Number
- EU-CTR: European Union Clinical Trials Register

Notes

Availability of data and material

The results of the replicated search strategies used for analyses of the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

TF and SS designed and supervised the study. PL and JH replicated search strategies, gathered and analysed data. SS and JH drafted the manuscript. All authors revised critically the draft and approved the final manuscript.

Attachments

Available from
https://www.egms.de/en/journals/mibe/2021-17/mibe000216.shtml

1. Attachment1_mibe000216.pdf (110 KB)
   Characteristics of the included Cochrane Reviews
2. Attachment2_mibe000216.pdf (104 KB)
   Results of the replicated MEDLINE searches of the included reviews

References

1. Sampson M, McGowan J. Inquisitio validus Index Medicus: A simple method of validating MEDLINE systematic review searches. Res Synth Methods. 2011 Jun;2(2):103-9. DOI: 10.1002/jrsm.40
2. Bramer WM, Giustini D, Kramer BM. Comparing the coverage, recall, and precision of searches for 120 systematic reviews in Embase, MEDLINE, and Google Scholar: a prospective study. Syst Rev. 2016 Mar;5:39. DOI: 10.1186/s13643-016-0215-7
3. Sampson M, Tetzlaff J, Urquhart C. Precision of healthcare systematic review searches in a cross-sectional sample. Res Synth Methods. 2011 Jun;2(2):119-25. DOI: 10.1002/jrsm.42

4. Cooper C, Varley-Campbell J, Booth A, Britten N, Garside R. Systematic review identifies six metrics and one method for assessing literature search effectiveness but no consensus on appropriate use. J Clin Epidemiol. 2018 Jul;99:53-63. DOI: 10.1016/j.jclinepi.2018.02.025
5. Franco JVA, Garrote VL, Escobar Liquitay CM, Vietto V. Identification of problems in search strategies in Cochrane Reviews. Res Synth Methods. 2018 Sep;9(3):408-16. DOI: 10.1002/jrsm.1302
6. Bramer WM, Rethlefsen ML, Kleijnen J, Franco OH. Optimal database combinations for literature searches in systematic reviews: a prospective exploratory study. Syst Rev. 2017 Dec;6(1):245. DOI: 10.1186/s13643-017-0644-y
7. Cooper C, Lovell R, Husk K, Booth A, Garside R. Supplementary search methods were more effective and offered better value than bibliographic database searching: A case study from public health and environmental enhancement. Res Synth Methods. 2018 Jun;9(2):195-223. DOI: 10.1002/jrsm.1286
8. Baldo P, Doree C, Molin P, McFerran D, Cecco S. Antidepressants for patients with tinnitus. Cochrane Database Syst Rev. 2012 Sep;(9):CD003853. DOI: 10.1002/14651858.CD003853.pub3
9. Bauer A, Schmitt J, Bennett C, Coenraads PJ, Elsner P, English J, Williams HC. Interventions for preventing occupational irritant hand dermatitis. Cochrane Database Syst Rev. 2010 Jun;(6):CD004414. DOI: 10.1002/14651858.CD004414.pub2
10. Brett-Major DM, Lipnick RJ. Antibiotic prophylaxis for leptospirosis. Cochrane Database Syst Rev. 2009 Jul;(3):CD007342. DOI: 10.1002/14651858.CD007342.pub2
11. Chen W, Gluud C. Vaccines for preventing hepatitis B in health-care workers. Cochrane Database Syst Rev. 2005 Oct;(4):CD000100. DOI: 10.1002/14651858.CD000100.pub3
12. Choi BK, Verbeek JH, Tam WW, Jiang JY. Exercises for prevention of recurrences of low-back pain. Cochrane Database Syst Rev. 2010 Jan;(1):CD006555. DOI: 10.1002/14651858.CD006555.pub2
13. Dahm KT, Brurberg KG, Jamtvedt G, Hagen KB. Advice to rest in bed versus advice to stay active for acute low-back pain and sciatica. Cochrane Database Syst Rev. 2010 Jun;(6):CD007612. DOI: 10.1002/14651858.CD007612.pub2
14. de Groene GJ, Pal TM, Beach J, Tarlo SM, Spreeuwers D, Frings-Dresen MH, Mattioli S, Verbeek JH. Workplace interventions for treatment of occupational asthma. Cochrane Database Syst Rev. 2011 May;(5):CD006308. DOI: 10.1002/14651858.CD006308.pub3
15. Gross A, Kay TM, Paquin JP, Blanchette S, Lalonde P, Christie T, Dupont G, Graham N, Burnie SJ, Gelley G, Goldsmith CH, Forget M, Hoving JL, Brønfort G, Santaguida PL; Cervical Overview Group. Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 2015 Jan;(1):CD004250. DOI: 10.1002/14651858.CD004250.pub5
16. Henschke N, Ostelo RW, van Tulder MW, Vlaeyen JW, Morley S, Assendelft WJ, Main CJ. Behavioural treatment for chronic low-back pain. Cochrane Database Syst Rev. 2010 Jul;(7):CD002014. DOI: 10.1002/14651858.CD002014.pub3
17. Heymans MW, van Tulder MW, Esmail R, Bombardier C, Koes BW. Back schools for non-specific low-back pain. Cochrane Database Syst Rev. 2004 Oct;(4):CD000261. DOI: 10.1002/14651858.CD000261.pub2
18. Hilton MP, Zimmermann EF, Hunt WT. Ginkgo biloba for tinnitus. Cochrane Database Syst Rev. 2013 Mar;(3):CD003852. DOI: 10.1002/14651858.CD003852.pub3
19. Hoare DJ, Edmondson-Jones M, Sereda M, Akeroyd MA, Hall D. Amplification with hearing aids for patients with tinnitus and co-existing hearing loss. Cochrane Database Syst Rev. 2014 Jan;(1):CD010151. DOI: 10.1002/14651858.CD010151.pub2
20. Hobson J, Chisholm E, El Refaie A. Sound therapy (masking) in the management of tinnitus in adults. Cochrane Database Syst Rev. 2012 Nov;(11):CD006371. DOI: 10.1002/14651858.CD006371.pub3
21. Hoe VC, Urquhart DM, Kelsall HL, Sim MR. Ergonomic design and training for preventing work-related musculoskeletal disorders of the upper limb and neck in adults. Cochrane Database Syst Rev. 2012 Aug;(8):CD008570. DOI: 10.1002/14651858.CD008570.pub2
22. Hoekstra CE, Rynja SP, van Zanten GA, Rovers MM. Anticonvulsants for tinnitus. Cochrane Database Syst Rev. 2011 Jul;(7):CD007960. DOI: 10.1002/14651858.CD007960.pub2
23. Kuster AT, Dalsbø TK, Luong Thanh BY, Agarwal A, Durand-Moreau QV, Kirkehei I. Computer-based versus in-person interventions for preventing and reducing stress in workers. Cochrane Database Syst Rev. 2017 Aug;(8):CD011899. DOI: 10.1002/14651858.CD011899.pub2
24. Liira J, Verbeek JH, Costa G, Driscoll TR, Sallinen M, Isotalo LK, Ruotsalainen JH. Pharmacological interventions for sleepiness and sleep disturbances caused by shift work. Cochrane Database Syst Rev. 2014 Aug;(8):CD009776. DOI: 10.1002/14651858.CD009776.pub2
25. Luong Thanh BY, Laopaiboon M, Koh D, Sakunkoo P, Moe H. Behavioural interventions to promote workers' use of respiratory protective equipment. Cochrane Database Syst Rev. 2016 Dec;(12):CD010157. DOI: 10.1002/14651858.CD010157.pub2
26. Marshall S, Tardif G, Ashworth N. Local corticosteroid injection for carpal tunnel syndrome. Cochrane Database Syst Rev. 2007 Apr;(2):CD001554. DOI: 10.1002/14651858.CD001554.pub2
27. Martinez-Devesa P, Perera R, Theodoulou M, Waddell A. Cognitive behavioural therapy for tinnitus. Cochrane Database Syst Rev. 2010 Sep;(9):CD005233. DOI: 10.1002/14651858.CD005233.pub3
28. Medeiros I, Saconato H. Antibiotic prophylaxis for mammalian bites. Cochrane Database Syst Rev. 2001;(2):CD001738. DOI: 10.1002/14651858.CD001738
29. Meng Z, Liu S, Zheng Y, Phillips JS. Repetitive transcranial magnetic stimulation for tinnitus. Cochrane Database Syst Rev. 2011 Oct;(10):CD007946. DOI: 10.1002/14651858.CD007946.pub2
30. Naghieh A, Montgomery P, Bonell CP, Thompson M, Aber JL. Organisational interventions for improving wellbeing and reducing work-related stress in teachers. Cochrane Database Syst Rev. 2015 Apr;(4):CD010306. DOI: 10.1002/14651858.CD010306.pub2
31. Nieuwenhuijsen K, Faber B, Verbeek JH, Neumeyer-Gromen A, Hees HL, Verhoeven AC, van der Feltz-Cornelis CM, Bültmann U. Interventions to improve return to work in depressed people. Cochrane Database Syst Rev. 2014 Dec;(12):CD006237. DOI: 10.1002/14651858.CD006237.pub3
32. O'Connor D, Marshall S, Massy-Westropp N. Non-surgical treatment (other than steroid injection) for carpal tunnel syndrome. Cochrane Database Syst Rev. 2003;(1):CD003219. DOI: 10.1002/14651858.CD003219
33. O'Connor D, Page MJ, Marshall SC, Massy-Westropp N. Ergonomic positioning or equipment for treating carpal tunnel syndrome. Cochrane Database Syst Rev. 2012 Jan;(1):CD009600. DOI: 10.1002/14651858.CD009600
34. Page MJ, O'Connor D, Pitt V, Massy-Westropp N. Therapeutic ultrasound for carpal tunnel syndrome. Cochrane Database Syst Rev. 2013 Mar 28;(3):CD009601. DOI: 10.1002/14651858.CD009601.pub2
35. Page MJ, Massy-Westropp N, O'Connor D, Pitt V. Splinting for carpal tunnel syndrome. Cochrane Database Syst Rev. 2012 Jul;(7):CD010003. DOI: 10.1002/14651858.CD010003

36. Page MJ, O'Connor D, Pitt V, Massy-Westropp N. Exercise and mobilisation interventions for carpal tunnel syndrome. Cochrane Database Syst Rev. 2012 Jun;(6):CD009899. DOI: 10.1002/14651858.CD009899

37. Peñalba V, McGuire H, Leite JR. Psychosocial interventions for prevention of psychological disorders in law enforcement officers. Cochrane Database Syst Rev. 2008 Jul;(3):CD005601. DOI: 10.1002/14651858.CD005601.pub2

38. Peters S, Page MJ, Coppieters MW, Ross M, Johnston V. Rehabilitation following carpal tunnel release. Cochrane Database Syst Rev. 2016 Feb;(2):CD004158. DOI: 10.1002/14651858.CD004158.pub3

39. Phillips JS, McFerran D. Tinnitus Retraining Therapy (TRT) for tinnitus. Cochrane Database Syst Rev. 2010 Mar;(3):CD007330. DOI: 10.1002/14651858.CD007330.pub2

40. Roberts D, Buckley NA. Alkalinisation for organophosphorus pesticide poisoning. Cochrane Database Syst Rev. 2005 Jan;(1):CD004897. DOI: 10.1002/14651858.CD004897.pub2

41. Ruotsalainen JH, Sellman J, Lehto L, Jauhiainen M, Verbeek JH. Interventions for preventing voice disorders in adults. Cochrane Database Syst Rev. 2007 Oct;(4):CD006372. DOI: 10.1002/14651858.CD006372.pub2

42. Ruotsalainen JH, Sellman J, Lehto L, Jauhiainen M, Verbeek JH. Interventions for treating functional dysphonia in adults. Cochrane Database Syst Rev. 2007 Jul;(3):CD006373. DOI: 10.1002/14651858.CD006373.pub2

43. Sahar T, Cohen MJ, Ne'eman V, Kandel L, Odebiyi DO, Lev I, Brezis M, Lahad A. Insoles for prevention and treatment of back pain. Cochrane Database Syst Rev. 2007 Oct;(4):CD005275. DOI: 10.1002/14651858.CD005275.pub2

44. Scholten RJ, Mink van der Molen A, Uitdehaag BM, Bouter LM, de Vet HC. Surgical treatment options for carpal tunnel syndrome. Cochrane Database Syst Rev. 2007 Oct;(4):CD003905. DOI: 10.1002/14651858.CD003905.pub3

45. Thomas RE, Jefferson T, Lasserson TJ. Influenza vaccination for healthcare workers who care for people aged 60 or older living in long-term care institutions. Cochrane Database Syst Rev. 2016 Jun;(6):CD005187. DOI: 10.1002/14651858.CD005187.pub5

46. Tikka C, Verbeek JH, Kateman E, Morata TC, Dreschler WA, Ferrite S. Interventions to prevent occupational noise-induced hearing loss. Cochrane Database Syst Rev. 2017 Jul;(7):CD006396. DOI: 10.1002/14651858.CD006396.pub4

47. Verbeek JH, Martimo KP, Karppinen J, Kuijer PP, Viikari-Juntura E, Takala EP. Manual material handling advice and assistive devices for preventing and treating back pain in workers. Cochrane Database Syst Rev. 2011 Jun;(6):CD005958. DOI: 10.1002/14651858.CD005958.pub3

48. Verdugo RJ, Salinas RA, Castillo JL, Cea JG. Surgical versus non-surgical treatment for carpal tunnel syndrome. Cochrane Database Syst Rev. 2008 Oct;(4):CD001552. DOI: 10.1002/14651858.CD001552.pub2

49. Verhagen AP, Bierma-Zeinstra SM, Burdorf A, Stynes SM, de Vet HC, Koes BW. Conservative interventions for treating work-related complaints of the arm, neck or shoulder in adults. Cochrane Database Syst Rev. 2013 Dec;(12):CD008742. DOI: 10.1002/14651858.CD008742.pub2

Corresponding author:
Judith Heinz
Department of Medical Statistics, University Medical Center Göttingen, Humboldtallee 32, 37073 Göttingen, Germany
judith.heinz@med.uni-goettingen.de

Please cite as
Straube S, Heinz J, Landsvogt P, Friede T. Recall, precision, and coverage of literature searches in systematic reviews in occupational medicine: an overview of Cochrane Reviews. GMS Med Inform Biom Epidemiol. 2021;17(1):Doc02.
DOI: 10.3205/mibe000216, URN: urn:nbn:de:0183-mibe0002161

This article is freely available from
https://www.egms.de/en/journals/mibe/2021-17/mibe000216.shtml

Published: *2021-05-31*