AI w procesie opracowania syntez danych naukowych

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AI4ES

Kim jesteśmy?

Grupa badaczy z różnych instytucji:

- Akademia Górniczo-Hutnicza w Krakowie (AGH)
- Uniwersytet Jagielloński w Krakowie (UJ)
- Naukowa i Akademicka Sieć Komputerowa (NASK)
- University of Vienna
- University of Porto
- Cochrane

Po co?

1 279 327

referencji, które zostały zaindeksowane w MEDLINE w 2023.

~ 40 000

przeglądów systematycznych rocznie.

Dlaczego potrzebujemy przeglądów?


SR
RCT
BADANIA OBSERWACYJNE
OPIS SERII PRZYPADKÓW
OPIS PRZYPADKU

Wytyczne

Jakie są etapy ich opracowania?

1. Formułowanie pytania
2. Wybór punktów końcowych
3. Przegląd systematyczny
4. Ocena GRADE
5. Zastosowanie EtD
6. Rekomendacje


GIN
Guidelines
International
Network


Campbell
Collaboration


Cochrane

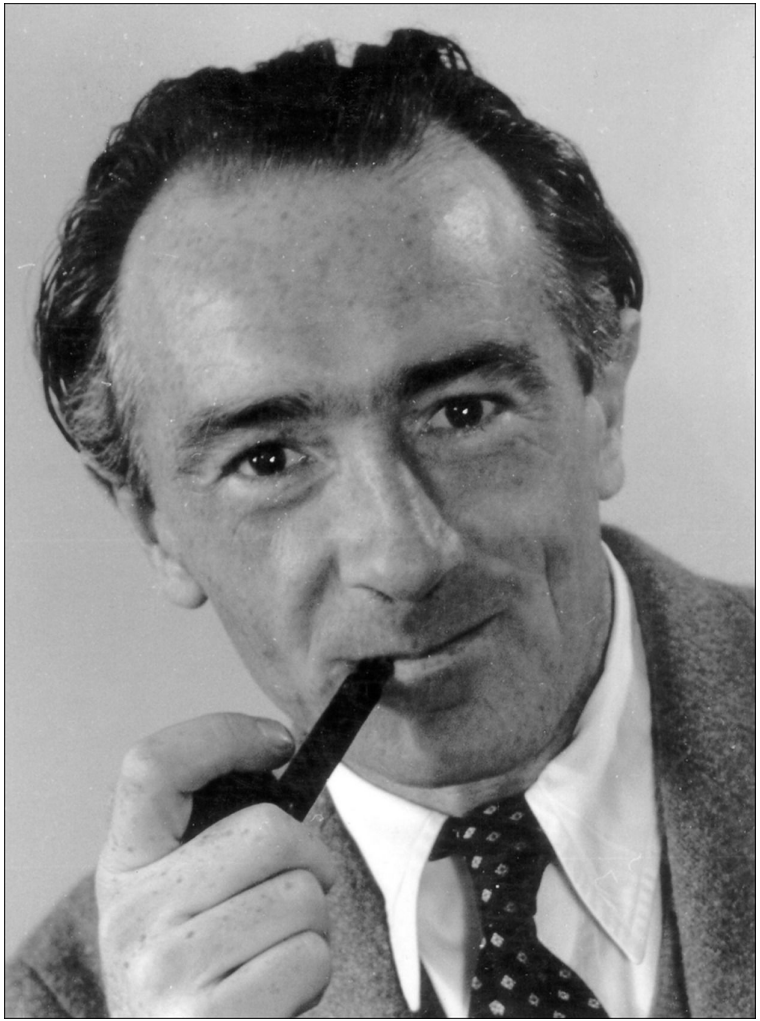

GRADE


JOANNA BRIGGS INSTITUTE

Archie Cochrane

Początki Evidence-Based Medicine (EBM).

Powinno się nasz zawód poddać poważnej krytyce za to, iż do tej pory nie opracowaliśmy okresowo uaktualnianych krytycznych podsumowań wszystkich badań z randomizacją dotyczących poszczególnych specjalizacji i działów medycyny.



Gdzie potrzebne są przeglądy?

Poza medycyną.

Wszędzie tam, gdzie badany jest **człowiek**: psychologia, socjologia, interakcja człowiek-komputer, etc.

Jak opracować przegląd systematyczny?

Przegląd systematyczny

Jakie są kroki, które trzeba wykonać, aby przegląd opracować?

1. Upewnienie się, że tworzenie przeglądu ma sens.
2. Protokół badania.
3. Identyfikacja.
4. Ekstrakcja danych.
5. Ocena jakości.
6. Synteza danych.
7. Publikacja.
8. Przekazanie wyników społeczeństwu.

Czemu to jest ważny etap?

Marnowanie czasu i zasobów

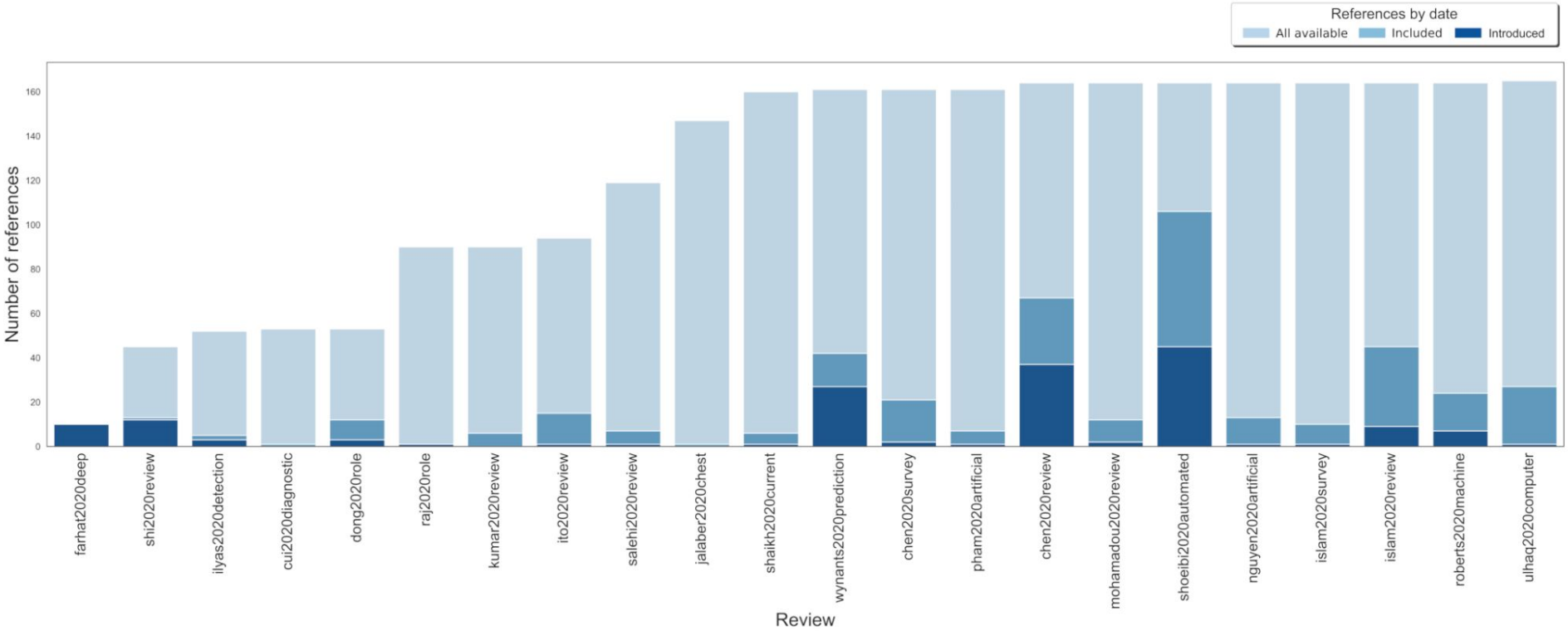
Ioannidis, J. P. (2005). Why most published research findings are false. *PLoS medicine, 2*(8), e124.

Ioannidis, J. P. (2016). The mass production of redundant, misleading, and conflicted systematic reviews and meta-analyses. *The Milbank Quarterly, 94*(3), 485-514.

Storman, M., Storman, D., Jasinska, K. W., Swierz, M. J., & Bala, M. M. (2020). The quality of systematic reviews/meta-analyses published in the field of bariatrics: A cross-sectional systematic survey using AMSTAR 2 and ROBIS. *Obesity Reviews, 21*(5), e12994.

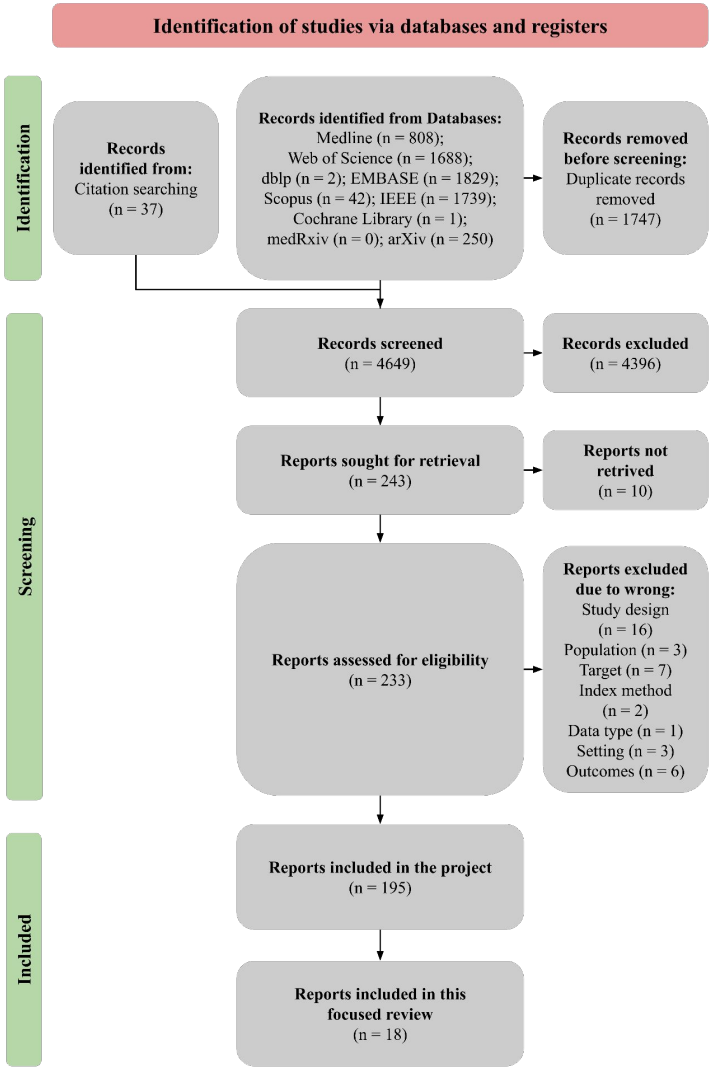
METANAUKA

nauka o nauce.

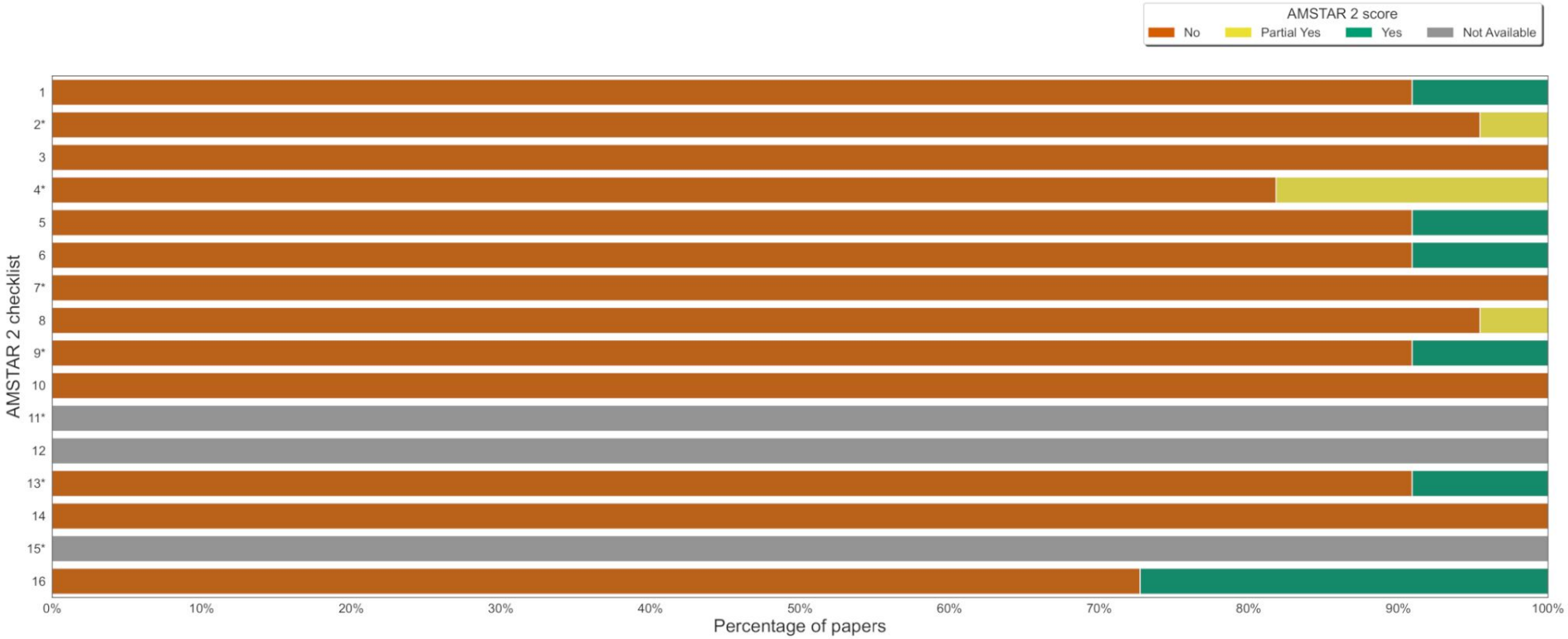


Jemioło, P., Storman, D., & Orzechowski, P. (2022). Artificial Intelligence for COVID-19 Detection in Medical Imaging — Diagnostic Measures and Wasting — A Systematic Umbrella Review. Journal of Clinical Medicine, 11(7), 2054.

Jemioło, P., Storman, D., Mamica, M., Szymkowski, M., Żabicka, W., Wojtaszek-Główka, M., & Ligęza, A. (2022). Datasets for Automated Affect and Emotion Recognition from Cardiovascular Signals Using Artificial Intelligence — A Systematic Review. Sensors, 22(7), 2538.

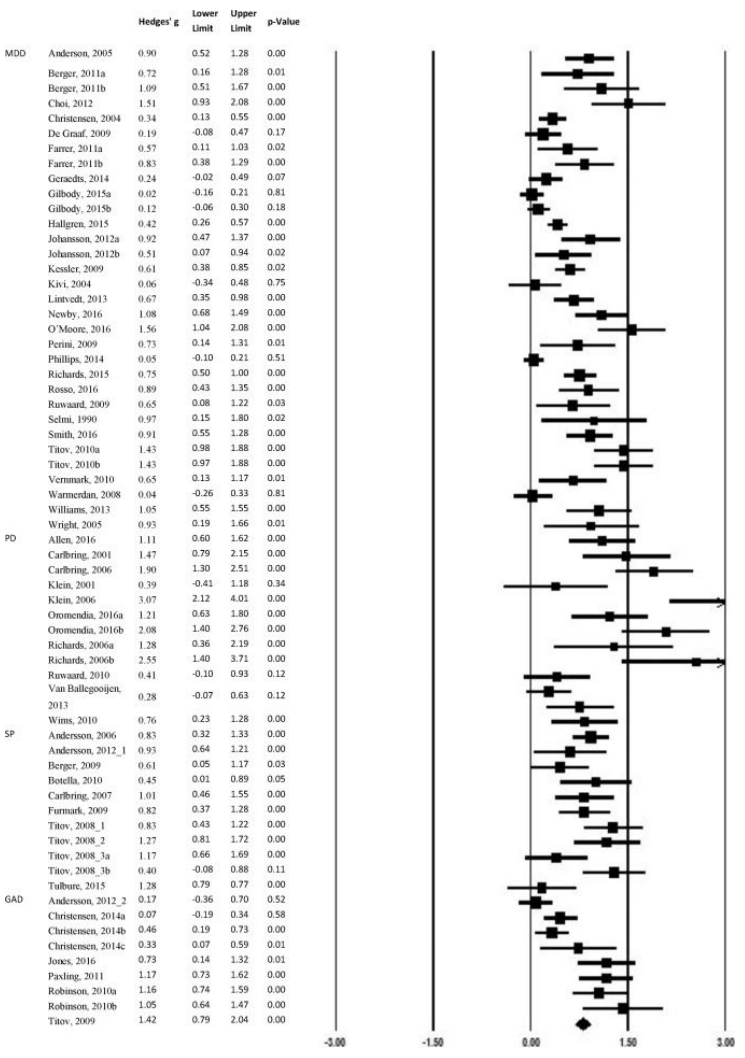


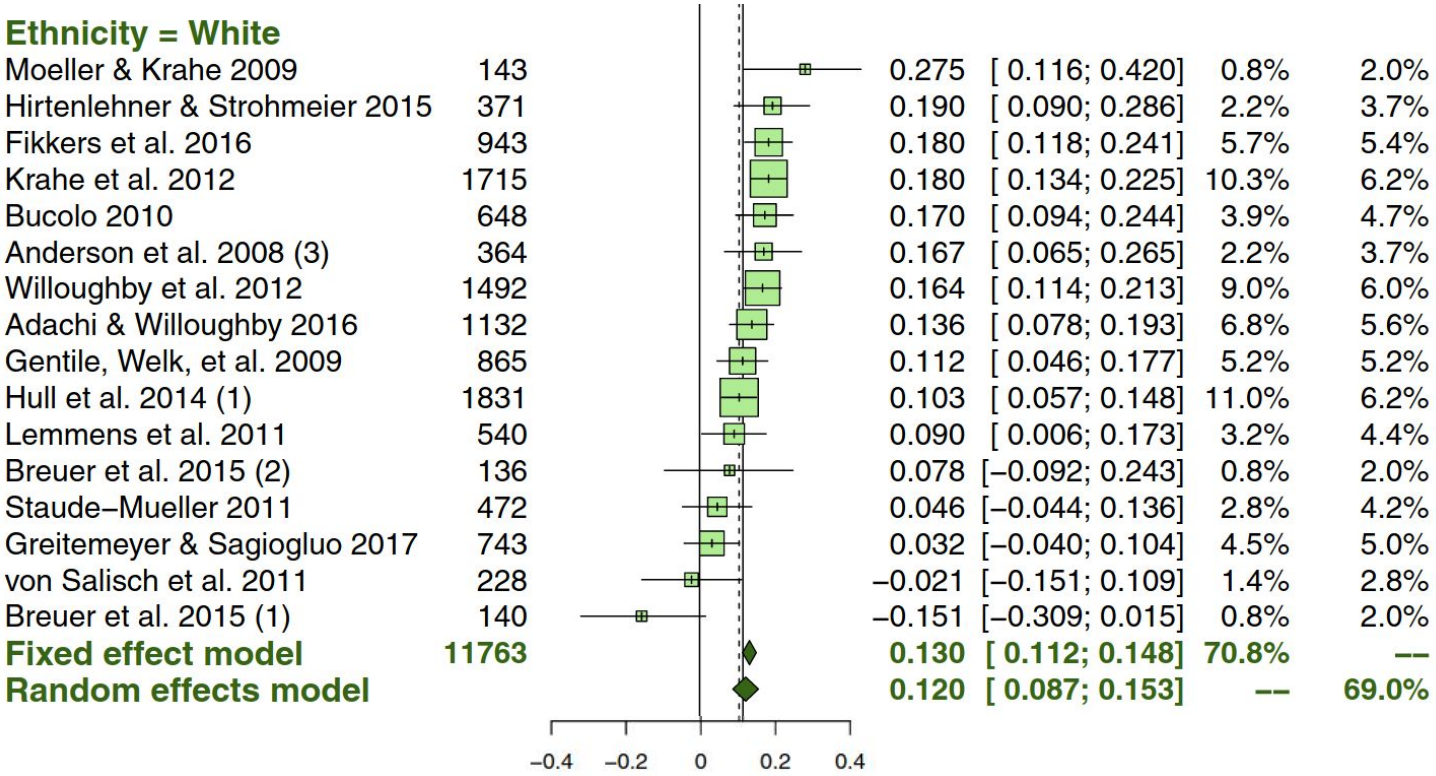
Rev.	Name of the first author and first letter of the name	Year of publication	Title	Journal/name of the conference	Is study eligible? 1 = Yes 2 = No	Country of corresponding authors	E-mail to corresponding author and first author	Study design 1 = Qualitative 2 = Cross-sectional 3 = Experimental 4 = Observational 5 = Review 6 = Other, specify NR	Funding 0 = No funding 1 = Non-industry funding 2 = Industry funding 3 = Other (provide in comment) NR	COI reported? 0 = No 1 = Yes, no significant COI / no COI 2 = Yes, significant COI 3 = Other (provide in comment)	Ethical approval obtained / ethical consideration taken into account 0 = No 1 = Yes, approval obtained 2= Yes, only consideration (nie ma zgody, ale standardy przestrzegane) NR	Was written/any consent obtained from participants? 0 = No 1 = Yes (also if online by clicking) NR NA	Pre-post pandemic 1 = Before the pandemic outbreak (30.01.2020); 2 = After the pandemy end (5.05.2023) 3 = Unknown 4 = During (30.01.20-05.05.23) e.g., jeżeli porównanie przed pandemią i po niej, to 1;2	Start date (since recruitment) Month (short), Year	End date (till last follow-up) Month (short), Year	Comments
DS+PJ	Ammons	2004	Working at Home: Experiences of Skilled White Collar Workers	Sociological Spectrum	1	USA	skammons@yahoo.com	1	NR	NR	NR	NR	1	NR	NR	
DS+PJ	Bezerra	2020	How Human and Organizational Factors Influence Software Teams Productivity in COVID-19 Pandemic: A Brazilian Survey	ACM International Conference Proceeding Series	1	Brazil	carlailane@ufc.br	1;2	1	0	NR	1	4	May,2020	May,2020	



Jemioło, P., Storman, D., & Orzechowski, P. (2022). Artificial Intelligence for COVID-19 Detection in Medical Imaging — Diagnostic Measures and Wasting — A Systematic Umbrella Review. Journal of Clinical Medicine, 11(7), 2054.

Andrews, G., Basu, A., Cuijpers, P., Craske, M. G., McEvoy, P., English, C. L., & Newby, J. M. (2018). Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: an updated meta-analysis. Journal of anxiety disorders, 55, 70-78.





Prescott, A. T., Sargent, J. D., & Hull, J. G. (2018). Metaanalysis of the relationship between violent video game play and physical aggression over time. Proceedings of the National Academy of Sciences, 115(40), 9882-9888.

PLS

Plain language summaries

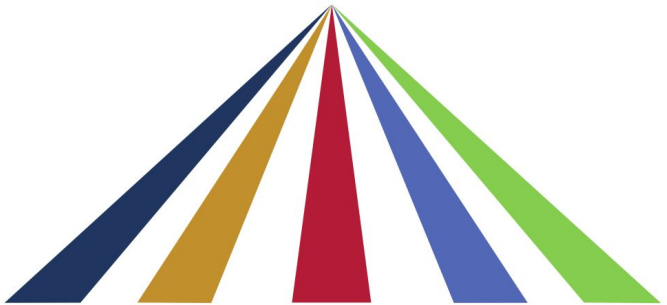
https://www.cochranelibrary.com/search

Laver, K. E., Lange, B., George, S., Deutsch, J. E., Saposnik, G., & Crotty, M. (2017). Virtual reality for stroke rehabilitation. Cochrane database of systematic reviews, (11).

Review question We wanted to compare the effects of virtual reality versus an alternative treatment or no treatment on recovery after stroke using arm function and other outcomes such as walking speed and independence in managing daily activities after stroke.
Background Many people after having a stroke have difficulty moving, thinking, and sensing. This often results in problems with everyday activities such as writing, walking, and driving. Virtual reality and interactive video gaming are types of therapy being provided to people after having a stroke. The therapy involves using computer-based programs designed to simulate real life objects and events. Virtual reality and interactive video gaming may have some advantages over traditional therapy approaches as they can give people an opportunity to practise everyday activities that are not or cannot be practised within the hospital environment. Furthermore, there are several features of virtual reality programs that might mean that patients spend more time in therapy: for example, the activity might be more motivating.
Study characteristics We identified 72 studies involving 2470 people after stroke. A wide range of virtual reality programs were used, with most aimed to improve either arm function or walking ability. The evidence is current to April 2017.
Key results Twenty-two trials tested whether the use of virtual reality compared with conventional therapy resulted in an improved ability to use one's arm and found that the use of virtual reality did not result in better function (low-quality evidence). When virtual reality was used in addition to usual care or rehabilitation to increase the amount of time the person spent in therapy there were improvements in the functioning of the arm (low-quality evidence). Six trials tested whether the use of virtual reality compared with conventional therapy resulted in improved walking speed. There was no evidence that virtual reality was more effective in this case (low-quality evidence). Ten trials found that there was some evidence that virtual reality resulted in a slightly better ability to manage everyday activities such as showering and dressing (moderate-quality evidence). However, these positive effects were found soon after the end of the treatment and it is not clear whether the effects are long lasting. Results should be interpreted with caution as, while there are a large number of studies, the studies are generally small and not of high quality. A small number of people using virtual reality reported pain, headaches, or dizziness. No serious adverse events were reported.
Quality of the evidence The quality of the evidence was generally of low or moderate quality. The quality of the evidence for each outcome was limited due to small numbers of study participants, inconsistent results across studies, and poor reporting of study details.

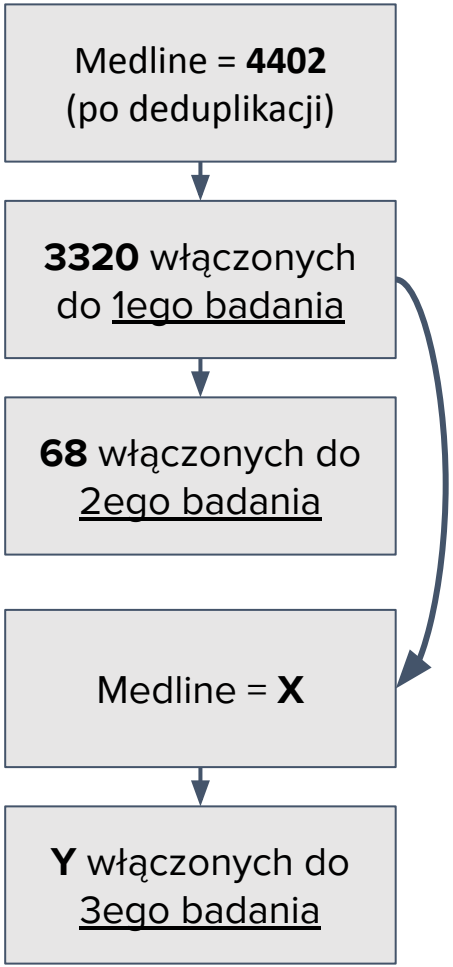
Gdzie tutaj miejsce dla AI?

Praktycznie na każdym etapie!


Global Evidence Summit
Using evidence. Improving lives.

RAISE

Responsible **AI** in Evidence **S**ynth**E**sis (RAISE): guidance and recommendations.



Badanie przekrojowe

3 etapy.

Awesome Systematic Reviews

Repozytorium GitHub.

Kolejne kroki

Prace w trakcie (na przyszłość)

1. Badanie wyjaśnialności metod do automatycznej identyfikacji.
2. Generowanie PLS przy pomocy LLM.
3. Ekstrakcja przy pomocy LLM.
4. Ocena jakości włączonych badań przy pomocy LLM.
5. Generowanie kryteriów dopuszczalności do przeglądu na podstawie celu.
6. Przegląd efektywności AI w syntezach danych naukowych.
7. Porównawcza ocena jakości top 100 cytowanych przeglądów.

(I wiele więcej. Zapraszam do dołączenia: pawljmlo@agh.edu.pl)

Dziękuję!