



THE ECOSYSTEM
OF EVIDENCE

Lessons learned in the pandemic
era and future challenges

10th International Conference for EBHC Teachers and Developers
10th Conference of the International Society for EBHC
Taoximi, 25th - 28th October 2023

#EBHC2023



A bibliometric analysis of statistical terms used in American Physical Therapy Association journals: Pre- to Post-COVID lockdown

Clarisa Martinez & Julie
Tilson
University of Southern
California

Background

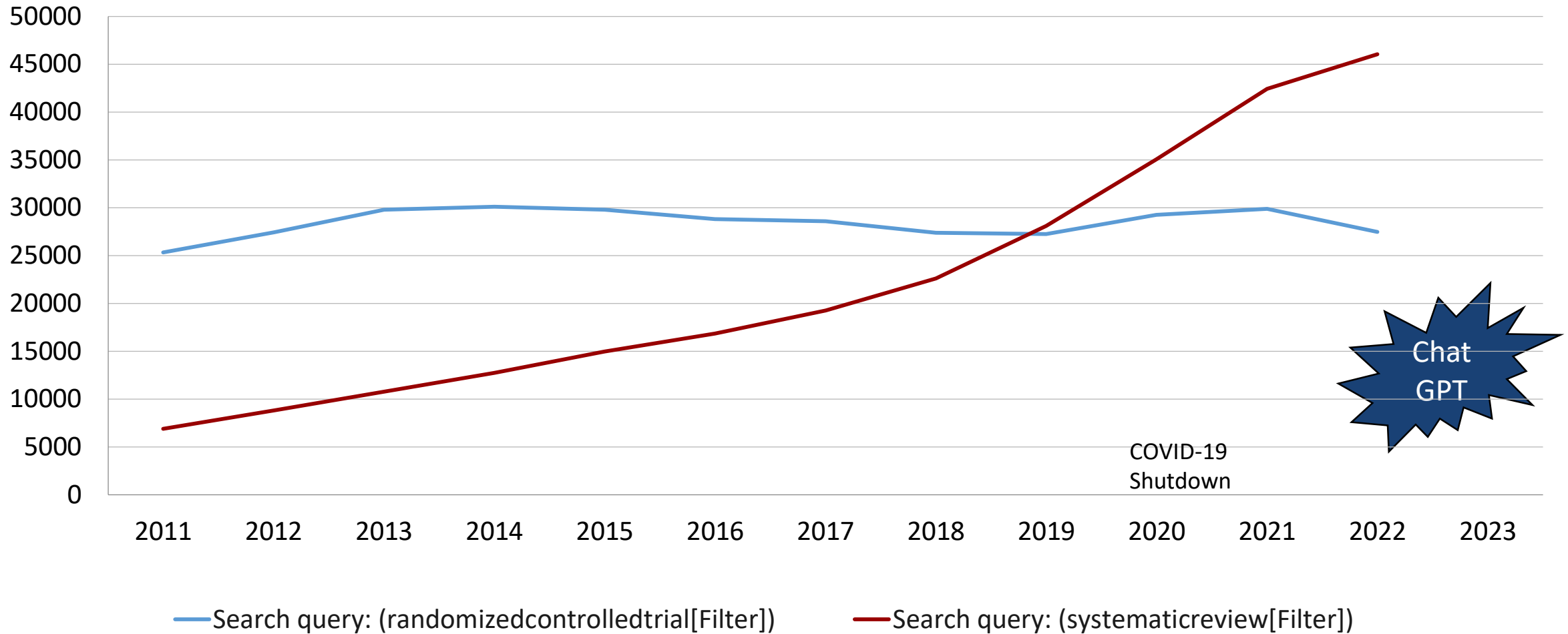
- Evidence based physiotherapist (PT) practice education should be informed by evidence ¹
 - In 2011-12, most common study designs PTs likely to encounter:
 - Prospective cohort, case report, randomized controlled trials ¹
 - Update is needed
- Research productivity was impacted by worldwide COVID-19 shutdowns
 - Shift in types of studies published pre- to post- COVID

¹Tilson et al., *BMC*, 201



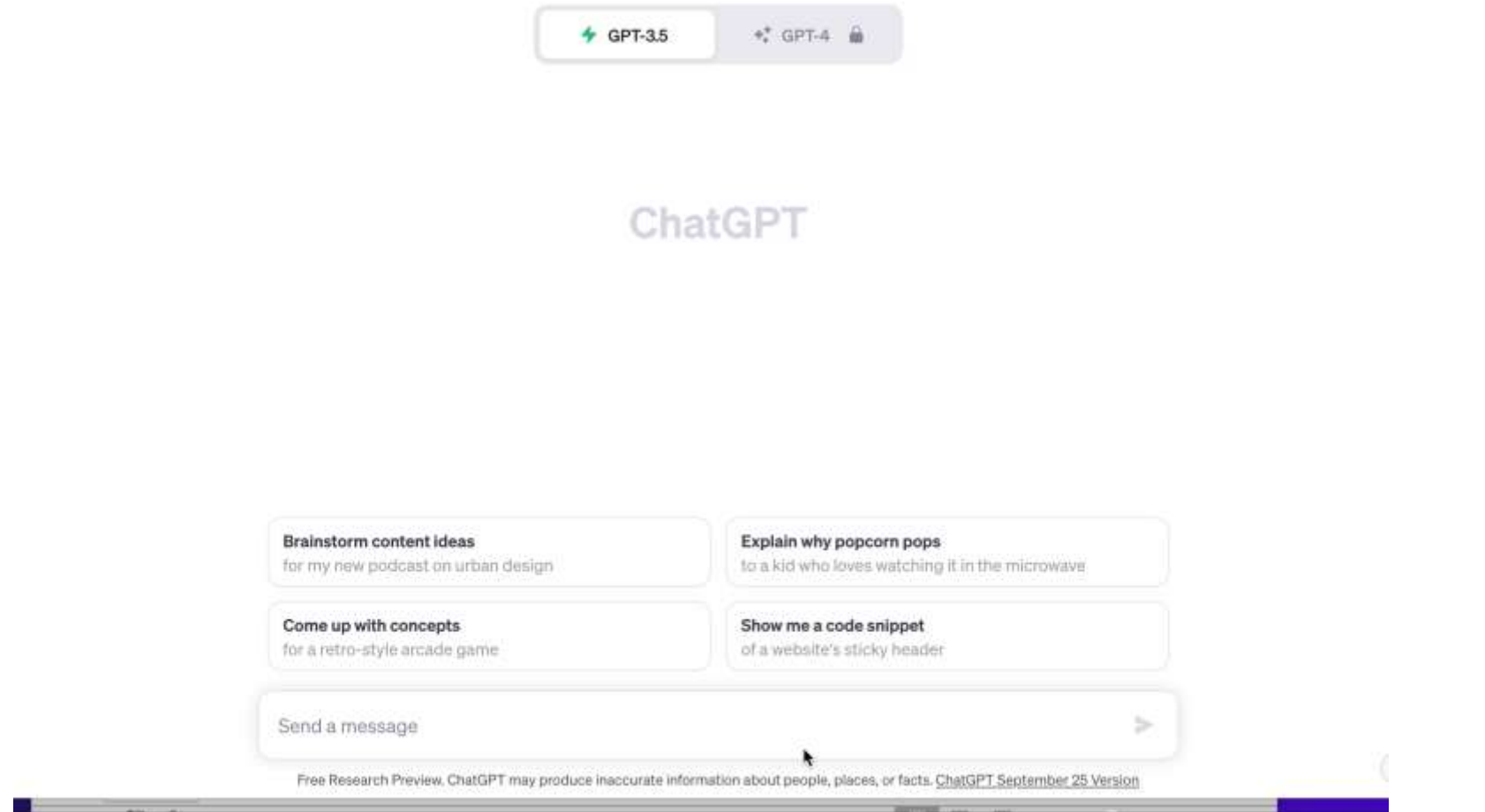
Background

Number of studies indexed in PubMed



Background

- Large language models, like ChatGPT, may be useful to pull study information—like study design—from abstracts



<https://chat.openai.com>
Accessed 16/10/2023

Aims

- To use Generative Pre-Trained Transformer (GPT) to identify the most common study designs used in published physiotherapy research before and after COVID-19 lockdown



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Methods

Three American Physical Therapy Association journals selected:



*Physical Therapy & Rehabilitation
Journal
(PTJ)*

<https://academic.oup.com/ptj>

Impact factor: 4.0 (2023)



*Journal of Orthopedic &
Sports Physical Therapy
(JOSPT)*

<https://www.jospt.org>

Impact factor: 6.1 (2023)



*Journal of Neurologic
Physical Therapy (JNPT)*
<https://journals.lww.com/jnpt/pages/default.aspx>
Impact factor: 3.8 (2023)

Methods

- PubMed used to pull study metadata from the 3 journals for 2019 and 2022.
- Data organized into a comma separated value (CSV) spreadsheet with title and abstract columns

NIH National Library of Medicine
National Center for Biotechnology Information

PubMed®

Advanced

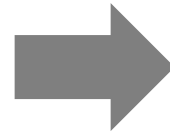
Save Email

Randomized Controlled Trial > J Orthop Sports Phys Ther. 2022 May;52(5):287-299.
doi: 10.2519/jospt.2022.10874.

Adding Physical Activity Coaching and an Activity Monitor Was No More Effective Than Adding an Attention Control Intervention to Group Exercise for Patients With Chronic Nonspecific Low Back Pain (PAYBACK Trial): A Randomized Trial

Crystian B Oliveira, Diego G D Christofaro, Chris G Maher, Márcia R Franco, Anne Tiedemann, Fernanda G Silva, Tatiana M Damato, Michael K Nicholas, Rafael Z Pinto

PMID: 35536245 DOI: 10.2519/jospt.2022.10874



Title	Abstract
<p>Adding Physical Activity Coaching and an Activity Monitor Was No More Effective Than Adding an Attention Control Intervention to Group Exercise for Patients With Chronic Nonspecific Low Back Pain (PAYBACK Trial): A Randomized Trial</p>	<p>* OBJECTIVE: To investigate whether adding physical activity coaching and an activity monitor enhanced the effects of a group exercise program on pain intensity and disability for people with chronic nonspecific low back pain. * DESIGN: Randomized controlled trial with concealed allocation, intention-to-treat analysis, and blinding of participants and assessors. * METHODS: One hundred sixty participants with chronic nonspecific low back pain who were aged between 18 and 60 years and seeking care at an outpatient physiotherapy clinic participated. Both groups received supervised group exercise therapy. The intervention group also received physical activity coaching sessions aimed at improving physical activity, and physical activity electronic feedback delivered by an activity monitor. The attention control group received modified approaches of coaching sessions and an activity monitor. Disability was measured using the Roland Morris Disability Questionnaire (0-24), and pain intensity was measured using the 11-point Numerical Rating Scale (0-10). Linear mixed models were performed to test for differences between groups. * RESULTS: There were no differences between groups for reductions in disability (mean difference [MD] = -0.5 out of 24 points; 95% confidence interval [CI]: -2.2, 1.1) and pain intensity (MD = -0.4 out of 10 points; 95% CI: -1.3, 0.5) at 3-month follow-up. There were no between-groups differences at 6- and 12-month follow-up assessments. * CONCLUSION: Adding targeted physical activity coaching and an activity monitor did not reduce pain intensity or disability more than an attention control approach in participants with chronic low back pain who were undertaking a group exercise program. ABSTRACT FROM AUTHOR</p>



Methods

- Python code to query GPT for each title and abstract, output a JSON file
- GPT output checked by reviewer.

Title	Abstract
Adding Physical Activity Coaching and an Activity Monitor Was No More Effective Than Adding an Attention Control Intervention to Group Exercise for Patients With Chronic Nonspecific Low Back Pain (PAYBACK Trial): A Randomized Trial	* OBJECTIVE: To investigate whether adding physical activity coaching and an activity monitor enhanced the effects of a group exercise program on pain intensity and disability for people with chronic nonspecific low back pain. * DESIGN: Randomized controlled trial with concealed allocation, intention-to-treat analysis, and blinding of participants and assessors. * METHODS: One hundred sixty participants with chronic nonspecific low back pain who were aged between 18 and 60 years and seeking care at an outpatient physiotherapy clinic participated. Both groups received supervised group exercise therapy. The intervention group also received physical activity coaching sessions aimed at improving physical activity, and physical activity electronic feedback delivered by an activity monitor. The attention control group received modified approaches of coaching sessions and an activity monitor. Disability was measured using the Roland Morris Disability Questionnaire (0-24), and pain intensity was measured using the 11-point Numerical Rating Scale (0-10). Linear mixed models were performed to test for differences between groups. * RESULTS: There were no differences between groups for reductions in disability [mean difference (MD) = -0.5 out of 24 points; 95% confidence interval (CI): -2.2, 1.1] and pain intensity [MD = -0.4 out of 10 points; 95% CI: -1.3, 0.5] at 3-month follow-up. There were no between-groups differences at 6- and 12-month follow-up assessments. * CONCLUSION: Adding targeted physical activity coaching and an activity monitor did not reduce pain intensity or disability more than an attention control approach in participants with chronic low back pain who were undertaking a group exercise program. ABSTRACT FROM AUTHOR



GPT Model
gpt-3.5-turbo
Temperature = 0



GPT Category
**Randomized
Controlled Trial**



Summary of Query:

- Use title and abstract to determine the study design and choose a category from a provided list, **without deviation. If abstract is blank, identify as “not applicable”**
- Put the study design and category responses without explanations **in a compliant JSON format**



URL for example query

Results

- 716 total articles in 3 journals
 - 2019: 352
 - 2022: 364
- GPT performance varied by category

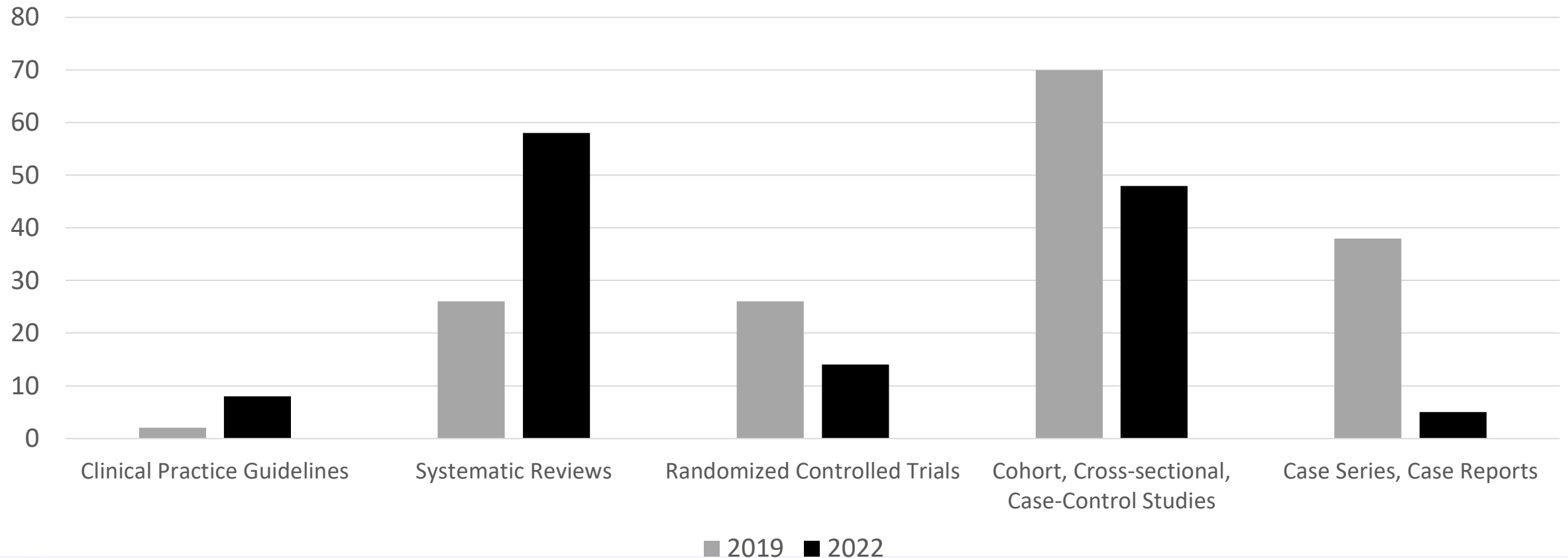
Study category	N	GPT/Rater agreement
Clinical Practice Guideline	10	100.0%
Systematic Review	84	70.2%
Randomized Controlled Trial	40	32.5%
Observational Cohort, Cross-Sectional, Case-Control	118	78.0%
Single subject/case study	43	41.9%
Commentary, Perspective paper, or narrative review	146	86.3%



Results

Post-COVID: more synthesized research, fewer primary studies

Study designs identified from title/abstract from 3 PT journals, 2019-2022



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Limits

- Limited to three American physiotherapy journals
- Newer GPT models have data rate limits
 - Requires running queries in batches
 - Limits review of full text
- GPT output requires double-checking^{2,3}
 - Articles often met criteria for multiple categories

²Tang et al., *npj Digital Med*, 2023

³Shaib et al., arXiv, 2023



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Conclusions

- More synthesized research in PT journals post-COVID, fewer primary studies
- Feasible to use GPT to assist with abstract review
 - Requires careful query construction, process to double-check GPT results
- Can improve output consistency by instructing GPT:
 - To categorize study design based on a provided list
 - How to respond to missing data
- Future work:
 - **Need systematic mechanisms for reporting the use of generative AI in research like this and beyond**

