UNIVERSITY OF PÉCS
MEDICAL SCHOOL

SPORTMED
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Introduction to parasports

Basic research in para sports

POTEcho

PTE289

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http://potecho.pte.hu

Databases of scientific literature

Where can we search / explore scientific articles about para sports?

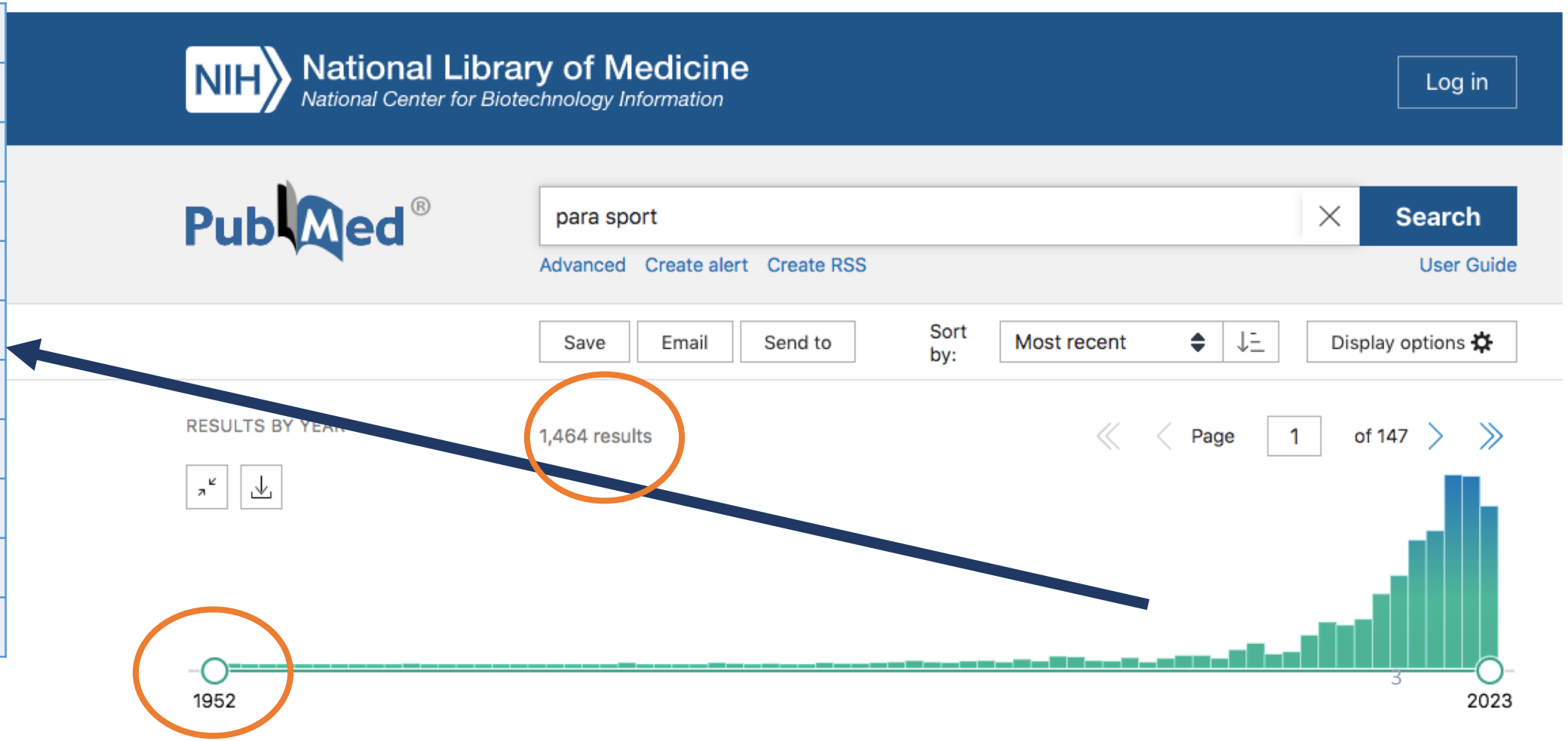
- **Scopus: multidisciplinary**
- **Web of Science: multidisciplinary**
- **PubMed: medicine, biological sciences**
- **ERIC: education science**
- **IEEE (Institute of Electrical and Electronics Engineers) Xplore: engineering**
- **ScienceDirect: multidisciplinary**
- **Directory of Open Access Journals (DOAJ): multidisciplinary**
- **JSTOR: multidisciplinary, articles before 1924**

Reference: https://paperpile.com/g/academic-research-databases/

Scientific literature in para sports (PubMed)

Number of all articles in para sports: 1464

Year	Count
2022	259
2021	261
2020	184
2019	171
2018	122
2017	97
2016	62
2015	54
2014	58
2013	4



Reference: https://pubmed.ncbi.nlm.nih.gov/?term=para+sport&timeline=expanded&sort=date&sort_order=asc

Scientific literature in sports (PubMed)

Number of all articles about sports: 949 416

Reference: https://pubmed.ncbi.nlm.nih.gov/?term=sport+or+exercise+or+physical+activity&sort=date

Scientific literature in para sports (Scopus)

Number of all articles in para sports

The Paralympics has undergone tremendous growth over the past half century—1960: 400 athletes with a disability (from 23 countries), 2012: several thousand competitors (over 100 countries) (Murdoch, 2012)

PubMed	
Year	Count
2022	259
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2020	184
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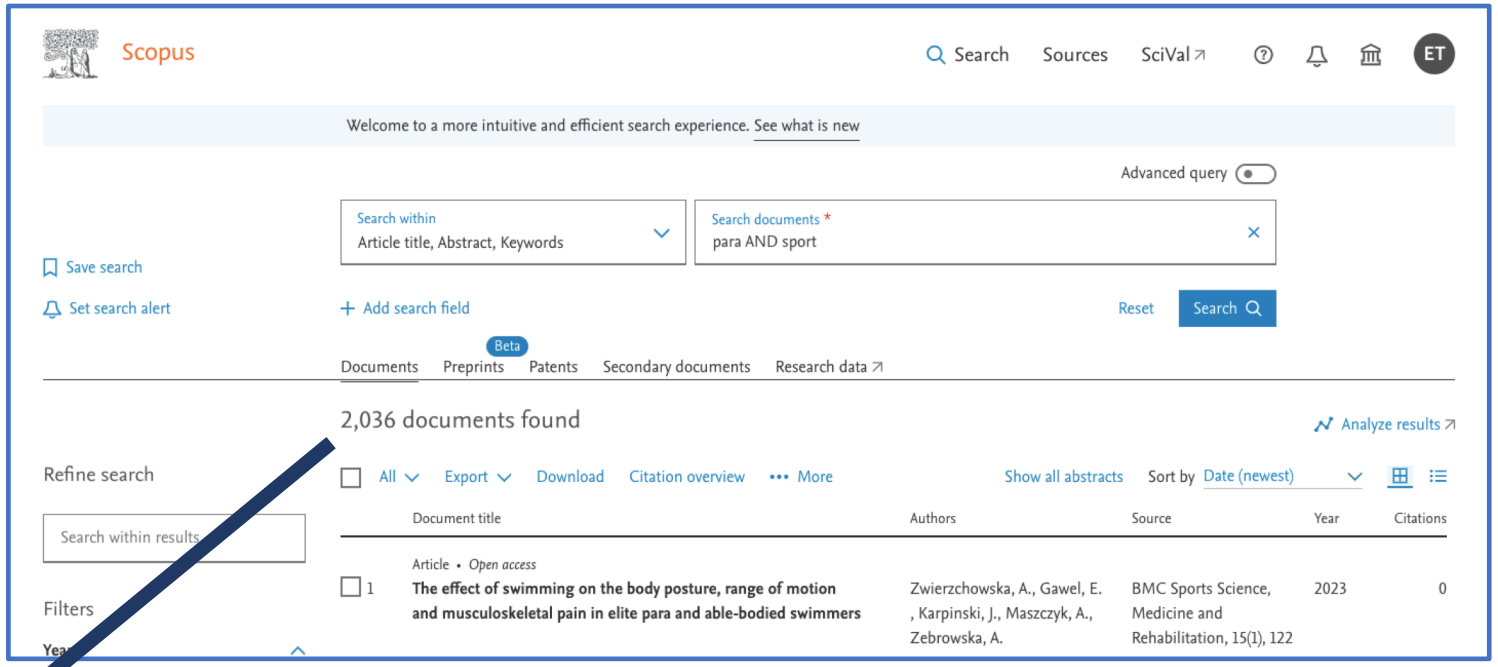
2018	122
2017	97
2016	62
2015	54
2014	58
2013	4
Total	1464

Scopus	
Year	Count
2022	259
2021	299
2020	175
2019	160
2018	154
2017	86
2016	66
2015	67
2014	49
2013	60
Total	2036



Reference: https://www.scopus.com/results/results.uri?sort=plf-f&src=s&st1=para+sport&sid=339555d30834500a24b6c403b1502c3d&sot=b&sdt=b&sl=25&s=TITLE-ABS-KEY%28para+sport%29&origin=searchbasic&editSaveSearch=&yearFrom=Before+1960&yearTo=Present, Murdoch, J. (2012, August 30). London 2012 Paralympic athletes: The full list of competitors and disciplines. The Guardian.

Research topics in para sport articles

What do you think which scientific field related to para sport is most often researched?

- ☐ Physics and Astronomy
- ☐ Chemical Engineering
- ☐ Earth and Planetary Sciences
- ☐ Decision Sciences
- ☐ Multidisciplinary
- ☐ Dentistry
- ☐ Mathematics
- ☐ Environmental Science
- ☐ Computer Science
- ☐ Neuroscience
- ☐ Veterinary
- ☐ Pharmacology, Toxicology and Pharmaceutics
- ☐ Economics, Econometrics and Finance
- ☐ Materials Science
- ☐ Chemistry
- ☐ Energy
- ☐ Immunology and Microbiology
- ☐ Medicine
- ☐ Health Professions
- ☐ Social Sciences
- ☐ Psychology
- ☐ Engineering
- ☐ Nursing
- ☐ Biochemistry, Genetics and Molecular Biology
- ☐ Arts and Humanities
- ☐ Business, Management and Accounting
- ☐ Agricultural and Biological Sciences

References: www.insidethegames.biz/articles/1124066/para-sports-commonwealth-games-history

Research topics in paras port articles

Subject area

Filter by subject area

Medicine	(960)	Environmental Science	(35)	Physics and Astronomy	(8)
Health Professions	(676)	Computer Science	(31)	Chemical Engineering	(7)
Social Sciences	(481)	Neuroscience	(31)	Earth and Planetary Sciences	(7)
Psychology	(230)	Veterinary	(15)	Decision Sciences	(6)
Engineering	(63)	Pharmacology, Toxicology and Pharmaceutics	(14)	Multidisciplinary	(6)
Nursing	(63)	Economics, Econometrics and Finance	(13)	Dentistry	(5)
Biochemistry, Genetics and Molecular Biology	(62)	Materials Science	(13)	Mathematics	(4)
Arts and Humanities	(53)	Chemistry	(10)		
Business, Management and Accounting	(51)	Energy	(10)		
Agricultural and Biological Sciences	(43)	Immunology and Microbiology	(8)		

References: https://www.scopus.com/results/results.uri?sort=plf-f&src=s&st1=para+sport&sid=339555d30834500a24b6c403b1502c3d&sot=b&sdt=b&sl=25&s=TITLE-ABS-KEY%28para+sport%29&origin=searchbasic&editSaveSearch=&yearFrom=Before+1960&yearTo=Presenthttps://www.insidethegames.biz/articles/1124066/para-sports-commonwealth-games-history

Sport science related research topics in para sport articles I.

Dehghansai et al, 2017: systematic review about training effectiveness based on 21 articles

Purpose of this study was to synthesize the available studies that have explored aspects of development of athletes with a disability and examined the key determinants of successful development and sporting performance.

Three conceptual categories:

- Training and practice (n = 9)
- Short-term interventions (n = 8)
- Long-term changes due to training (n = 4)

Conclusion:

- Studies **focused on short-term interventions** and training programs to enhance performance in practice and competition
- Due to limited literature available, none of the current studies provided information regarding how to maintain **long-term training or the most effective ways to train**.

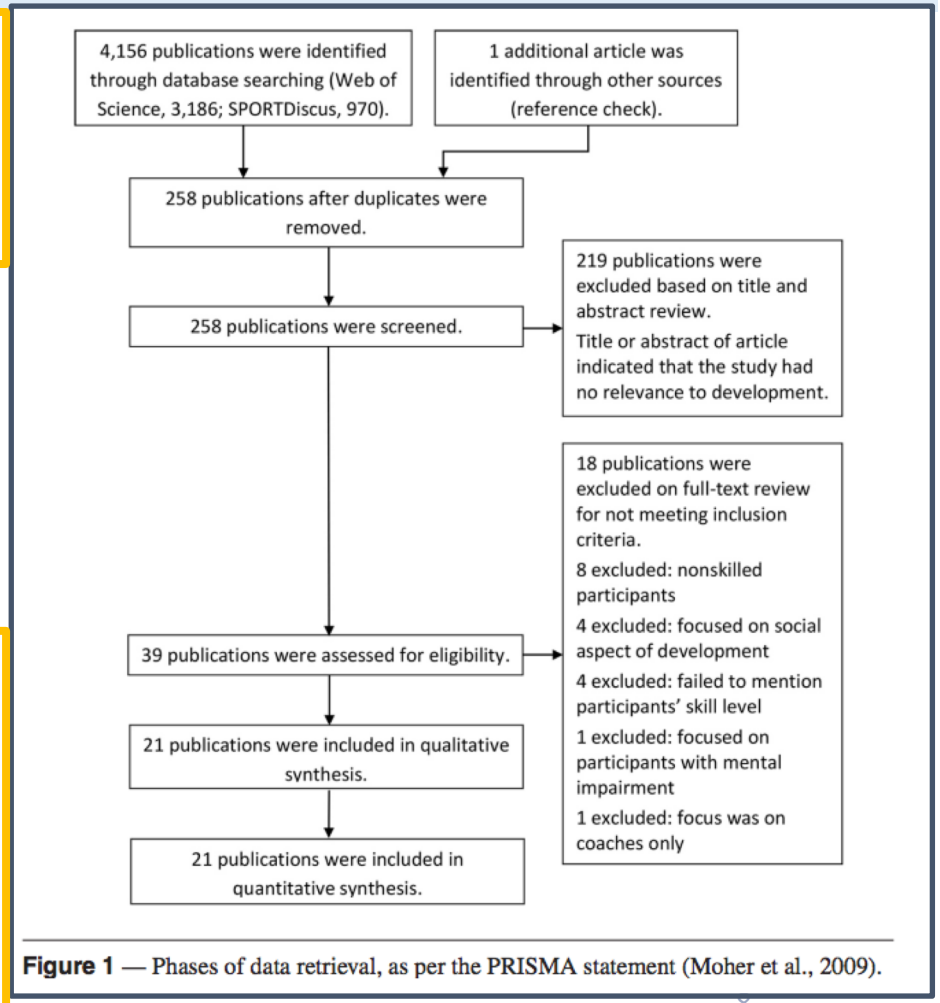


Figure 1 — Phases of data retrieval, as per the PRISMA statement (Moher et al., 2009).

References: Dehghansai, N., Lemez, S., Wattie, N., & Baker, J. (2017). A systematic review of influences on development of athletes with disabilities. Adapted Physical Activity Quarterly, 34(1), 72-90. doi:10.1123/APAQ.2016-0030

Sport science related research topics in para sport articles

Patatas et al, 2018; athletic development in parasports; Storli et al., 2022

Aim: analyze how para athletes **progress through developmental phases** of an athletic career pathway by comparing differences.

The purpose of this study was to investigate the **developmental pathways** of para-athletes toward elite performance.

Results of **online survey** (n=345, from 15 sports):

- **Developmental phases** for athletes with acquired impairment takes 4.5 years to reach the elite phase, while athletes with congenital impairment take 6 years.
- Athletes with **congenital impairment** start in parasport 8 years younger and win medals in international competitions 7 years.

Results of **retrospective interviews** (n=8, world class para athletes):

- **Early childhood** sport-related encounters in a family environment followed by sampling of various organized and coach-led sports
- **Youth sport period:** heterogenous, transitions towards elite-level practice competition, coaching. **Significant contributions** are parents, friends, coaches, motivational climate.

References: Patatas, J. M., De Rycke, J., De Bosscher, V., & Kons, R. L. (2021). It's a Long Way to the Top: Determinants of Developmental Pathways in Paralympic Sport. Adapted physical activity quarterly : APAQ, 38(4), 605–625.
Storli, L.; Aune, M.A.; Lorås, H. Aspects of Developmental Pathways toward World-Class Parasport. Sports 2022, 10, 123.

Health and medicine in para sport articles I.

Aitchison et al, 2022; health benefits of individuals with a disability participating in sport

Aim: To investigate the experiences and perceived health benefits of sport participation across four disability populations: children and adolescents, adults, elite athletes and veterans with a disability.

Results, conclusion of this review (children and adolescents, adults, elite athletes and veterans with a disability):

- Overall sport is a beneficial experience for individuals with a disability
- Several **positive aspects of sport participation**: socialization opportunities, pure enjoyment, a sense of freedom.

References: Aitchison, B., Rushton, A. B., Martin, P., Barr, M., Soundy, A., & Heneghan, N. R. (2022). The experiences and perceived health benefits of individuals with a disability participating in sport: A systematic review and narrative synthesis. Disability and health journal, 15(1), 101164. https://doi.org/10.1016/j.dhjo.2021.101164

Health and medicine in para sport articles II.

Sakai et al, 2022; upper extremity health of para athletes

Aim: This study aimed to investigate the characteristics of joint disorders in **elite wheelchair basketball players** using magnetic resonance imaging (MRI).

Results of MRI (n=10, elite para athletes):

- more right-sided, left-sided and bilateral latero-posterior **lesions**
- **cysts** found on the lateral-posterior corner of the capitulum of the humerus
- Severe damage to the **right triangular fibrocartilage complex** was also observed

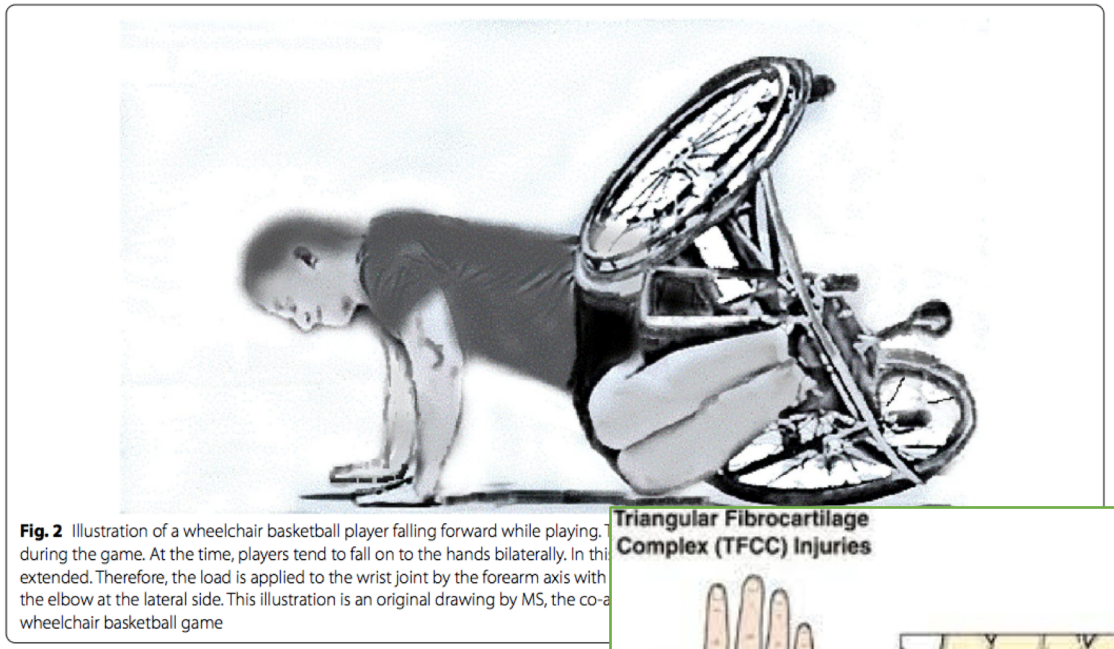
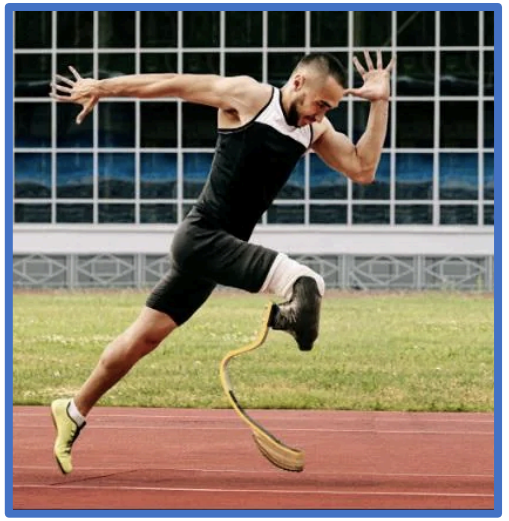


Fig. 2 Illustration of a wheelchair basketball player falling forward while playing. T
during the game. At the time, players tend to fall on to the hands bilaterally. In thi
extended. Therefore, the load is applied to the wrist joint by the forearm axis with
the elbow at the lateral side. This illustration is an original drawing by MS, the co-a
wheelchair basketball game

References: Sakai, M., Mutsuzaki, H., Shimizu, Y., Okamoto, Y., & Nakajima, T. (2022). Characteristic MRI findings of the shoulder, elbow, and wrist joints in elite wheelchair basketball players. *BMC sports science, medicine & rehabilitation*, *14*(1), 141. https://doi.org/10.1186/s13102-022-00528-9

Psychological aspect in para sport articles

- Bentzen et al, 2022: described elite Para athletes' **mental distress**, before, during and after the Beijing Paralympic Games. They reported a **high proportion of mental distress** during the Winter Paralympic Games among elit para athletes. The results also show that it is important and feasible to monitor and detect Para athletes' mental distress.



- Bosma and Van Yeperen, 2022: The aim of the present study among wheelchair basketball athletes (n = 141) was to explore the role of **functional classification** as a potential stressor. They did not find any evidence of a classification effect on either the mediator variables or competitive anxiety. Para athletes' cognitive worries may be reduced by self-efficacy interventions

References: Bentzen, M., Kenttä, G., Karls, T., & Fagher, K. (2022). Monitoring mental distress in Para athletes in preparation, during and after the Beijing Paralympic Games 2022: A 22 week prospective mixed-method study. Frontiers in sports and active living, 4, 945073. Bosma, N., & Van Yperen, N. W. (2020). A Quantitative Study of the Impact of Functional Classification on Competitive Anxiety and Performance Among Wheelchair Basketball Athletes. Frontiers in psychology, 11, 558123.

Important research questions in para sports

- What is the ideal training program for the different type of elite and amateur para athletes? (to maximize the physical performance, meanwhile prevent chronic diseases)

- How can improve knowledge and education of the sport professionals in para sports?

Best moments of Paralympics
Never forget, who are the subjects of these researches.

https://www.youtube.com/watch?v=XnZX0HkxRbg

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Thank you for your attention!

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