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Influence of Physical Activity on Quality of Life among Adults with Spinal Cord Injury: A systematic review

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Abstract:

Study Design:

Systematic review of cross-sectional study

Background:

Patients with acquired spinal cord injuries (SCIs) are extremely concerned about their well-being and standard of living. (Including health, ability to engage with others, and ability to perform everyday tasks) following an inpatient rehabilitation treatment and reintegration into the community. Paralysis, sphincter malfunction, and sensory impairments are all possible outcomes of spinal cord damage.

Objective:

To determine the influence of physical activity on quality of life among adult with spinal cord injury

Method:

The impact of physical activity on the quality of life of individuals with spinal cord injuries was examined by a systematic review that involved advanced searches in PubMed, PEDro, the Cochrane Library, and Google Scholar.

Study selection:

All titles and abstracts were evaluated by three reviewers separately from PubMed

(9002), PEDro (15), the Cochrane Library (357) and Google Scholar (5880). Non-relevant articles were removed from the study. The full-text articles were subsequently evaluated to determine their eligibility for inclusion in the review

Conclusion:

The result of this systematic review demonstrated that greater quality of life improvement with physical activity in SCI patients due to positive effect on physical functioning, social and mental functioning and exercise maintenance.

Introduction:

Paralysis, sensory deficiencies, and sphincter dysfunction can all be consequences of spinal cord injury (SCI). (Holtz & Levi, 2010). Patients with acquired spinal cord injuries are extremely concerned about their health and quality of life. (Including health, ability to engage with others, and ability to perform everyday tasks) upon discharge from a hospital-based rehabilitation programme and reintegration into community life. (Boakye, Leigh, & Skelly, 2012).

Most SCI survivors experience additional psychological and physical problems. Individuals suffering from spinal cord injury (SCI) are more vulnerable to infection, and this risk is exacerbated when personal hygiene and medical care are neglected. (Ghazwin, Chaibakhsh, Latifi, Tavakoli, & Koushki, 2015). Traumatic SCIs are usually caused by falls, automobile accidents, and violence, although nontraumatic SCIs are equally well-documented and often caused by infection or cancer. (Fassett et al., 2007). The lowest point on the spinal cord below which motor function and sensory perception are diminished or absent is the degree of injury for an individual with spinal cord injury (SCI).

According to authors knowledge this is the first systematic review of cross sectional study who find the influence of physical activity on quality of life among adults with spinal cord injury. Furthermore we want to see the physically active person quality of life vs physically inactive person QoL.

Methodological Approach:

In order to identify studies, two independent reviewers thoroughly searched the databases of the Cochrane Library, PubMed, Google Scholar, and PEDro. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) criteria were followed in this process. The screening procedure included the use of the following search terms: Spinal cord injury, exercise, quality of life, and systematic review. Only academic journal publications were included in the findings. Six items were found inside the PRISMA flow diagram displayed in Figure 1 PRISMA FLOW CHART by March 2023.

A systematic literature search was conducted using the following electronic databases: PubMed, PEDro, and the Cochrane Library. The Medical Subject Heading (MeSH) and pertinent keyword combinations were found for each database separately and used in the search. Examining the relevant studies' reference lists was another way to find relevant studies. Two independent reviewers choose the pertinent research according to the eligibility requirements based on the

article titles and abstracts. The full-text papers were then screened to see if they were suitable for review. The primary findings of this systematic review focused on how physical activity affected the quality of life for those who had spinal cord injuries. 15 Cross sectional studies were included with time limit (1999-2023), Age \geq 18-year to 60-year. Articles in the English language were present. There were only full-text articles made accessible. Patient SCI level between C4-L1.

Research involving important medical disorders such as angina, heart disease, arrhythmias, and other severe issues, patients with tracheotomies and pacemaker user were excluded. Books/book chapters, workshop papers, grey literature were excluded. After the titles and abstracts of the chosen research were examined, the full texts of the selected articles were retrieved and examined. Lastly, a comprehensive relevancy check was performed on entire texts.

The New Castle Ottawa scale (NOS) was utilised to assess the quality of the study. Nine points make up the NOS scale: two for comparability, three for the results that indicate whether or not the included articles were biased, and four for selection. (Zheng et al., 2017). The study's quality was rated as follows: a score of 7-9 meant it was good, a score of 4-6 meant it was moderate, and a score of 0-3 meant it was low.

RESULT

In total, 15,254 articles were present. After the duplicate articles are removed, the titles and abstracts of the remaining 3564 articles are compared to the eligibility standards previously stated. In order to decide whether or not to approve them. After a review of the abstract and title, 11600 studies were eliminated because they were not in English (120), not relevant (7000), had a different study design (4003), and were not full text articles (477). Ninety more full-text publications are currently being evaluated for eligibility; of these, seventy-one did not specify the type of injury, which resulted in their elimination. Ultimately, a total of six articles were selected for the evaluation. If a relationship between the interventions and the results can be found, it will be more likely if I can decrease bias and random error in the selection process. Figure 1 is a PRISMA flow diagram that illustrates how studies are chosen for inclusion and how many studies were chosen.

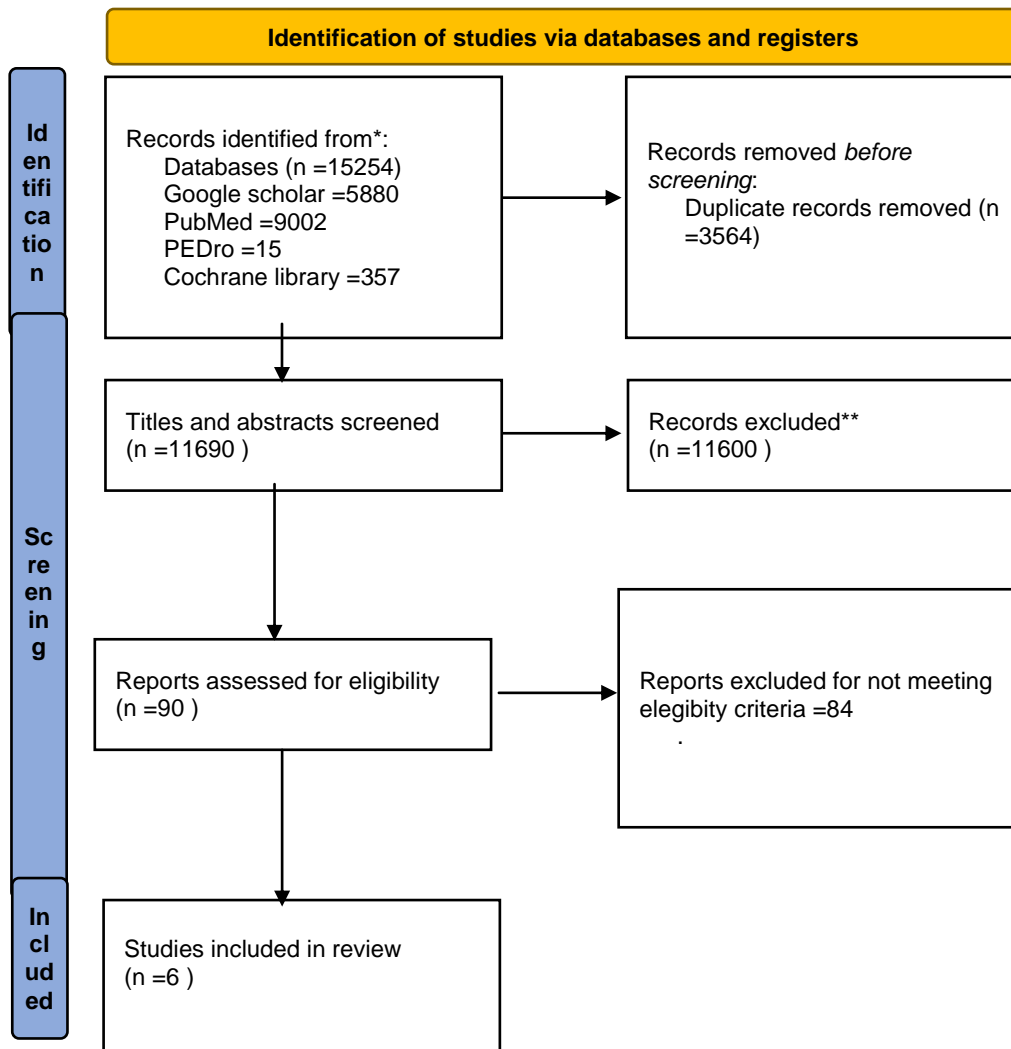


Figure 1 PRISMA FLOW CHART

A summary of the features of the included studies is given in Table 1.

S.Number	Author/year ; study methodology; applied quality-of life tool	study layout/designs	Sample	Goals	Level/severity of the injury	Outcomes /Results
1.	Sandy L.steven et al (2016) Quality of wellbeing scale	Cross sectional study	N= 62(male 32, Female	To ascertain whether the level of	Complete and partial spinal cord	The degree of physical exercise and life

			30).	physical activity and the quality of life of an individual who has had a spinal cord injury are associated.	damage occur below C6	satisfaction are highly correlated (r= 0.75; P < 0.05).
2.	V Anneken et al(2009) QOL feedback Questionnaire	Retrospective Cross sectional study	N=100 (21 female and 79 male)	Finding out how much physical activity impacts the quality of life for those who have spinal cord injury	Below C5	People were noticeably more athletic after SCI (P=0.007)
3.	Tjasa Filipcic et al(2021) Self-made Questionnaire	Cross sectional study	N=62 15 female and 47 men	Determining the Physical Activity and Quality of Life of Spinal Cord Injury Victims	T6 (six)-12(twelve).	The results of the study showed that 31 thoracic level SCI (T6-T12) patients who were physically active had a superior quality of life than 31 patients who were not physically active.
4.	Moghimian Met al 2015 SF-36 QOL Questionnaire	Cross sectional study	N=106 (male=66, female=46)	to find out the physical activity effect on	C5(five)-T12(twelve)	Workout Participants experienced less

				QOL among the people of SCI.		stress (p =0.01) and less pain (p =0.03) than controls after three months. After three months exercisers reported better QOL (p=0.007),
5.	Patricia J Manns 1999 Maximal incremental exercise test on arm ergometer, leisure time exercise questionnaire	Cross sectional study	N=38 (male =28, female =10	to determine the relationship among physical activity and QOL in SCI persons .	C4-L1 47% Paraplegia 53% tetraplegia	Exercises expressed greater physical functioning satisfaction , less stress, and less depressive symptoms than did controls.
6.	AM Lannem et al 2009 Self-perception in exercise questionnaire	Cross sectional study	N=116 (male=80 ,female=36); to investigate the effect of functional walking ability on quality of life in people with SCI.	21% Paraplegia 79% tetraplegia	Following BWSTT, there were notable increases in life satisfaction (p=0.05) and satisfaction with physical function (p=0.03).

Table 2: Risk of bias summary table that present the author’s judgments about each risk of bias item for each include study

S.NO	NOS Points	Sandy L.steven et al (2016) Tennessee	V Anneken et al(2009) Germany	Tjasa Filipcic et al(2021) Switzerland	Moghi mian Met al 2015 Iran	Patricia J Manns 1999 Canada	AM Lannem et al 2009 Norway
1.	Representative of the exposed cohort	★★★	★★★	★★★	★★★	★★★	★★★
2.	Selection of the non - exposed Cohort	★	●	★	●	●	●
3.	Ascertainment of exposure	★	★	★	★	★	★
4.	Demonstration that outcome of interest was not present at the start of study	★	★	★	★	★	★
5.	Comparability of cohorts on the basis of the design or analysis	★	★	★	★	●	★
6.	Assessment of cohort	★	★	★	★	★	★
7.	Was follow up long enough for outcomes to occur	★	●	★	●	●	●
8.	Adequacy of follow of cohorts	●	●	●	●	●	●
	Total Score	8/9	6/9	8/9	6/9	5/9	6/9

Discussion:

According to Sandy L. Steven et al., Individuals who actively participate in sports and physical education yet have suffered spinal cord injury are not the same as those who do not. In addition to being functional, like an improvement in physical resistance, mobility, and coordination, the consequences are also social and psychological, like an enhancement in self-confidence, selfconcept, or mental state. (Stevens et al., 2008. According to Fawkes-Kirby et al. those with incomplete SCI felt more worn out than those with complete injuries. According to Fawkes-

Kirby et al., people with incomplete SCI are not only more active than those with complete injuries, but they also require less equipment adaptations. (Manns & Chad, 1999).

Conclusion:

The result of this systematic review demonstrated that greater quality of life improvement with physical activity in SCI patients due to positive effect on physical functioning, social and mental functioning and exercise maintenance.

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