Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i2.4639

EFFECTS OF NURSING INTERVENTION PROGRAM ON ACTIVITIES OF DAILY LIVING PARAPLEGIA PATIENTS IN LAHORE, PAKISTAN

Shazia Yaqub[1*], Hajra Sarwar[2], Sarfraz Masih[3]

[1*]MSN Student, Lahore School of Nursing, University of Lahore, Pakistan, Email: shazia.yaqub@ymail.com
[2]Assistant Professor, Lahore School of Nursing, University of Lahore, Pakistan, Email: hajra.sarwer@lsn.uol.edu.pk
[3]Principal & Associate Professor, Lahore School of Nursing, University of Lahore, Pakistan., Email: sarfraz.masih@lsn.uol.edu.pk

[*]**Corresponding Author Detail:** Shazia Yaqub
*MSN Student, Lahore School of Nursing, University of Lahore, Pakistan
Email: shazia.yaqub@ymail.com

Abstract

Background: The Nursing interventions emerged as transformative agents, demonstrating a positive impact on enhancing skills, independence, and overall well-being of the patients with Paraplegia.

Objective: To assess the effects of Nursing Intervention Program on activities of daily life and its evaluation for patients with paraplegia.

Materials and Methods: Quasi-experimental, pre and post-study design was used. The study was conducted at the Punjab Institute of Neuro-Sciences Hospital Lahore. At initial, 41 patients with Paraplegia were recruited. Later, 1 patient was not reported and 4 patients were independent and educated. Therefore, 36 patients with Paraplegia were recruited for the study. The Need Assessment Checklist is used to assess if the Nursing Intervention Program has met the patients' requirements and whether they are ready for community reintegration. The Need Assessment Checklist questionnaire's Cronbach's Alpha score was determined to be 931. Pre-assessment was started soon after the approval letter from the research ethical committee. The principal researcher created a Nursing Intervention Program with the assistance of doctors of neurology and neurosurgery as well as specialist nurses. The paraplegic patients had a second evaluation for needs assessment as activities of daily life after two months of the intervention program. Data was entered and analyzed in SPSS version- 21. The mean ± standard deviations and Paired samples t-test were applied.

Conclusion: Notable post-intervention trends showcased improvements in skin management, bladder management and, emphasized the potential for comprehensive interventions to optimize the quality of life for individuals with paraplegia.

Keywords: Nursing Interventions, Paraplegia, Skin Management, Bladder Management, Mobility

1. INTRODUCTION

Paraplegia, a notable medical condition, often leads to considerable morbidity and enduring disability. This condition arises from the impairment of axons in neurons that traverse the spinal cord, leading

to the loss of both motor and sensory functions below the injury site. Typically, paraplegia is a consequence of a traumatic injury to the spinal nerves, with the initial damage often being irreversible (Ali, Mahmoud, & Hassan, 2022).

Paraplegia, a form of paralysis, hinders the movement of the lower half of the body. It ensues when an illness or injury disrupts the segment of the nervous system responsible for controlling the lower extremities (Qiang, Piermarini, & Baas, 2019). Spastic Paraplegia is a sizable collection of uncommon neurological illnesses that are hereditary and have the major symptom of difficulty walking as a result of stiffness and weakening in the legs' muscles (Toupenet Marchesi, Leblanc, & Stevanin, 2021).

Spinal Cord Injury (SCI) stands out as a leading cause of paraplegic impairment. Individuals affected by SCI often undergo a sudden and complete loss of bodily autonomy, necessitating dependence on others for care. The diminishing sensation, motor function, bladder and bowel control, and other associated impairments significantly limit daily activities. This can lead to the forfeiture of social roles, including employment and income loss, as well as exclusion from participation in sports and leisure pursuits. The cumulative impact of these factors can have profound emotional and psychological repercussions on the affected individual (Mason et al., 2024).

Paraplegia, often resulting from trauma, exhibits the most unfavorable functional outcomes and the lowest rates of return to work compared to other major organ injuries. Primary consequences of spinal injury encompass mechanical instability, along with complete or partial paralysis. Subsequent outcomes involve ischemia, axonal degeneration, vascular dysfunction, oxidative stress, demyelination, and inflammatory cell death (Mutepfa et al., 2022).

A study conducted in Rawalpindi, Pakistan, revealed that vehicle traffic accidents (n=20, 22%) and falls from height (n=64, 78%) constituted the two most prevalent modes of injury. The cervical region was the most frequently affected location in the study population (n=24, 28%), followed by the lumbar region (n=37, 44%). Among the fractures observed, L1 fracture was the most common, occurring in 29% of patients (n=25), with the L3 segment fracture being the second most frequent (n=8, 9%). The results for patients (p=.000) and the association between the location of the injury and the type of therapy (p=.000) were both deemed statistically significant (Mehmood et al., 2022).

Patients with spinal cord injuries participated in a cross-sectional study conducted at the Paraplegic Centre Hayatabad in Peshawar, Pakistan, spanning from November 2015 to January 2016. Utilizing a 26-item questionnaire on quality of life from the World Health Organization, the study revealed that 92.6% of subjects experienced paraplegia, while 7.4% had tetraplegia. The overall mean scores were 54.79 for the physical health domain, 52.33 for the psychological health domain, 58.79 for the social interaction domain, and 54.11 for the environmental domain (Albu et al., 2021).

Paraplegia refers to a spinal cord injury below the Thoracic 1 (T1) level, impacting functions such as sexual, bowel, and bladder functions, along with lower limb, trunk, and pelvic organ functions. It prevents the person from partaking in leisure, social, academic, and employment activities. The Nursing Intervention Program may help people restore their ability to carry out ADLs, but how they would go about doing so might change (Kalyani, Dassanayake, & Senarath, 2015). Spinal Cord Injury (SCI) exerts a substantial influence on independence and quality of life by imposing functional limitations on the sensory and motor systems, potentially affecting both lower and upper limb functions (De Araújo, Neiva, Monteiro, & Magalhães, 2019).

1.1 Significance of the Study

The objective of the Nursing Intervention Program is to foster physical independence in patients, address their needs, and facilitate their preparation for societal reintegration upon hospital discharge, ensuring they derive maximum benefit from the process (Giovannelli et al., 2023). The program aims to meet patients' requirements, and its examination will aid in preparing them for effective social integration. This efficient nursing intervention approach that caters to the patients' needs will cut down on the likelihood that they would have expensive problems. This would not only improve the patients' quality of life but also yield positive economic outcomes for both the individuals affected, their employers, and healthcare financiers, leading to potential long-term cost reductions.

1.2 Objective of the Study

To assess the effects of Nursing Intervention Program on activities of daily life and its evaluation for patients with paraplegia.

2. REVIEW OF THE LITERATURE

The Nursing Intervention Program focuses on the impact of a person's impairment, developmental challenges, or health condition on their life, prioritizing this over their diagnosis. This program involves collaboration with the individual and their key support network to assist them in reaching their maximum potential and achieving independence, while also promoting freedom of choice and control over their own life. The philosophy of this care approach aims to integrate individuals into their communities, workplaces, and educational institutions, steering away from marginalization and systems that offer diminishing prospects for leading fulfilling lives (Wade, 2020).

Individuals with spinal cord injuries experience sensory and motor deficits, as well as bladder and bowel problems, which limits their ability to participate in certain activities. The kind and extent of activity constraints and participation limitations depend on the person's social roles, the environment in which they live, the severity and location of the lesion, and other variables (Williams, Smith, & Papathomas, 2018).

Individuals experiencing a spinal cord injury (SCI) contend with various signs and symptoms beyond the loss of sensory and motor functions. These encompass discomfort, erectile dysfunction, digestive issues, impaired control of blood pressure and temperature, and compromised respiratory function. Among the numerous secondary complications associated with SCI, examples include deep vein thrombosis, heterotrophic ossification, pressure sores, and spasticity (Swaffield et al., 2022).

In order to determine the impact of coping-oriented supporting programs on individuals with paraplegic spinal cord injuries, a study was done in China. Results showed that before and post assessments for maladaptive coping, abilities, the satisfaction of social support, and life satisfaction showed statistically significant differences between groups (all P values 0.05). However, only at Time 2 were adaptive coping abilities significantly different (P = 0.001) (Li, Chien, & Bressington, 2020).

At the Paraplegic Center Peshawar, a study was done to find out how physical rehabilitation interventions affected people with post-traumatic paraplegic spinal cord injuries. The results showed that the eating, bathing, dressing, and grooming mean scores had significantly improved (p 0.001) as a result of the Nursing Intervention Program. The management of the bladder sphincter score increased from 2.785.6 to 9.94.8, respectively. The control of the bowel's sphincter and toilet usage both showed similar improvement (p 0.0001) (Zeb, 2020).

3. MATERIALS AND METHODS

3.1 Research Design

Quasi-experimental, pre and post study design was used. The Nursing Intervention Program was independent variable. A paraplegic patient's Nursing Intervention Program was likely included a variety of guiding and aiding activities, such as skin management, bladder and mobility skills. Activity of daily Life was dependent variable. The Need Assessment Checklist (NAC) was used in this study to assess activity of daily life in order to ascertain if patients' requirements have been met by the Nursing Intervention Program and whether they are ready for activity of daily life. The NAC had a minimum score of 0 and a maximum score of 81.

Patient completely DEPENDENT= Score < 27 out of 81
Patient moderately INDEPENDENT = Score 27-54 out of 81
Patient completely INDEPENDENT = Score >54 out of 81

3.2 Setting and Sampling

The study was conducted at the Punjab Institute of Neuro-Sciences Hospital Lahore. The study population consisted of all patients who were diagnosed by the medical doctor at PINS hospital with paraplegia admitted to the Punjab Institute of Neuro Sciences Hospital. The Purposive Sampling technique was used. The initially calculated sample size is 16, which falls below the recommended

sample of 30 for conducting a statistical test with optimal efficacy. To address this, 30 participants were chosen, incorporating a 20% dropout rate. Consequently, the adjusted sample size amounted to 36, determined using a specific formula:

$$N = \frac{\theta d2\ (Z\beta + Z\alpha/2)2}{(\text{Difference})2}$$

Where,
Pre total ADL Score= 5.269±1.746
Post total ADL score= 6.683±1.342 (Wang & Hong, 2015)
Θd= 0.404
μd= -1.414
Zβ= 1.28
Zα/2= 1.96

3.3 Study Duration
The study was completed within 9 months after the synopsis approval from the Research Ethical Committee (REC) of the University of Lahore.

3.4 Selection Criteria
The eligibility criteria for the recruitment of patients was as under:

3.4.1. Inclusion Criteria
- Patients who were diagnosed with paraplegia admitted to Punjab institute of Neuro sciences
- Patients with paraplegia admitted at PINS according to scale <27-54.

3.4.2 Exclusion Criteria
- Paraplegic patients with other serious systemic abnormalities
- Paraplegic patients with mental trauma such as loss of valuable like death of loved ones.

At initial, 41 patients with Paraplegia were recruited. Later, 1 patient was not reported and 4 patients were enough independent and educated. Therefore, 36 patients with Paraplegia were recruited for the study.

3.5 Tools for Data Collection
Following Research tool was used in this study:

3.5.1 Demographic Questionnaires
The demographic questionnaire for the patients was consisted of age, gender, disease status, and whom they lived with.

3.5.2 Needs Assessment Checklist (NAC)
It is a sensitive assessment tool adopted from (Henn, Mji, & Visagie, 2009) that offers a technique to determine and ensure that Nursing Intervention Program are tailored to meet the specific needs of each patient and that they equip patients with the skills necessary for their level of lesion and their demands. The Need Assessment Checklist is used to assess if the Nursing Intervention Program has met the patients' requirements and whether they are ready for community reintegration. A total of 27 items on this checklist relating to daily living activities for the participants, such as managing bladder and bowel control and skin care, were assessed on a likert scale from 0 to 3. Zero is the lowest possible score, and 81 numbers is the highest possible score.

3.6 Validity and Reliability

The content validity of the Need assessment Checklist was examined using content validity index testing. A questionnaire called the CVI for Need assessment checklist is (0.913253). The Need Assessment Checklist questionnaire's Cronbach's Alpha score was determined to be.931.

3.7 Data Collection Procedure

3.7.1 Pre assessment phase

Pre assessment was started soon after the approval letter from the research ethical committee. For pre assessment, those paraplegic patients were approached who had received their immediate care and treatment and were admitted at the neurology wards for rehabilitation and supportive care. In this phase, the self-modified needs assessment checklist questionnaire was used to gather the fundamental beginning data. Participants were delivered a questionnaire and a written consent form. The questionnaire was translated into Urdu according to their understanding level. The Urdu translation was then checked for content validity through Urdu and English experts. The goal and methodology of the study were communicated to them. The time allotted for participants to complete the questions was around 60 minutes. Questionnaires that had been completed were returned and processed for analysis.

3.7.2 Implementation Phase

The principal researcher created a Nursing Intervention Program with the assistance of doctors of neurology and neurosurgery as well as specialist nurses. This program addressed every aspect of human daily life function and how to enhance participants' capacity to better adapt to everyday tasks. The delivery of skill-training and knowledge-enhancement sessions improved remuneration for ordinary tasks in families and society. The intervention was administered on individual basis where an Urdu translated activity of daily life training booklet was administered to the participants in different (4-6) sessions. The content of the intervention covered the following main objectives.

3.7.3 Nursing Intervention Program

Need Assessment	**Interventional Activity**
Self-care skills, including activities of daily living (ADLs)	Assisting with feeding, grooming, bathing, dressing, and toileting
Physical care	Providing support for heart and lung function, nutritional requirements, and skin care
Mobility skills	Facilitating walking, transfers, and wheelchair self-propulsion
Communication skills	Addressing speech, writing, and alternative communication methods
Socialization skills	Engaging in interactions at home and within the community
Vocational training	Developing skills related to work
Psychological counseling	Identifying and addressing issues related to thinking, behavior, and emotions
Family support	Offering assistance in adapting to lifestyle changes, addressing financial concerns, and discharge planning
Education	Providing patient and family education and training on SCI, home care needs, and adaptive techniques

3.7.4 Post assessment phase

The paraplegic patients had a second evaluation for needs assessment as activities of daily life after two months of the intervention program. They were given the instruments for gathering data and asked to fill them out. After being returned, the completed questionnaires were compared to the pre-data that were gathered during the pre-assessment phase.

3.8 Data Analysis

Data was entered and analyzed in SPSS version- 21. Initially the descriptive analysis of all the demographic variables was performed to find their frequencies and percentages and displayed through frequency distribution table. Then the descriptive findings of the measuring variable (Activity of daily life) was done to find out its mean ± standard deviations scores and presented in the form of frequency. A Paired samples t-test was applied at the 95% confidence interval P-value < 0.05 had been considered statistically significant to determine the effect of nursing intervention program on activity of daily life among paraplegic patients.

3.9 Ethical Approval

The research adhered to the rules and regulations established by the ethical committee of the University of Lahore, ensuring the respectful treatment of the rights of research participants.

- Written informed consent was obtained from all recruited paraplegic patients to ensure their voluntary participation in the study.
- All information and data collection were kept confidential, so that to avoid any unnecessary breach of confidentiality of participants' sensitive information.
- The participants were informed that there is no any risk of this nursing intervention program which can violate their basic human rights or can give any physical and mental harm.
- Participants were informed of their right to withdraw from the study at any point during the research process.
- This research aimed to enhance the management of participants' activities of daily life, prioritizing their comfort and well-being.
- Stringent measures were in place to safeguard participants' privacy, and their identities were remained undisclosed in any publications resulting from the study.
- Participation in this research was entirely voluntary, and participants may choose not to participate or withdraw their consent at any time without facing any penalties.
- Participants were not faced any form of penalty for deciding not to participate or for withdrawing from the study.

4. RESULTS

Table 1. Demographic Characteristics of the Respondents (N=36)

Demographic Characteristics		**Frequency**	**Percentage**
Age	16-20	4	11.1
	21-25	5	13.9
	26-30	3	8.3
	31-35	5	13.9
	36-40	6	16.7
	41-45	4	11.1
	46-50	9	25.0
Gender	Male	26	72.2
	Female	10	27.8
Education Level	Uneducated	5	13.9
	Primary	9	25.0
	Middle	6	16.7
	High & Above	16	44.4
Occupation	Govt Employee	2	5.6
	Private Employee	3	8.3
	Daily Wages Worker	11	30.6
	Own Business	10	27.8
	Housewife	6	16.7

	Student	4	11.1
Average Household Monthly Income	Less than 20,000	6	16.7
	20,000 to 30,000	6	16.7
	31,000-40,000	11	30.6
	Above 40,000	13	36.1

The above table presents the demographic characteristics of the respondents, offering valuable insights into the composition of the study population. The respondents, totaling 36 individuals, were assessed based on key demographic factors, including age, gender, education level, occupation, and average household monthly income. The age distribution among the respondents was diverse, with the majority falling within the 46–50 age group (25.0%). The gender distribution indicated that 72.2% of the respondents were male, while 27.8% were female. Respondents' educational backgrounds varied, with the highest percentage (44.4%) having attained education levels categorized as high and above. The largest occupational group was those involved in daily wage work (30.6%). The distribution of average household monthly income revealed a spectrum, with 36.1% having an income above 40,000.

Table 2. Skin Management

Mean and Standard Deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Preventing Pressure Sores Pre-Intervention	.3472	36	.37875	.06313
	Preveting Pressure Sores Post-Intervention	2.8009	36	.51919	.08653

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Preventing Pressure Sores Pre-Interventions Preventing Pressure Sores Post-Interventions	-2.45370	.58365	.09728	-2.65118	-2.25622	-25.224	35	.000

Under the skin management, preventing pressure sore is a highly critical for the patient with Paraplegia. The paired samples test states that t-score of 25.2 with 35 degree of freedom, nursing intervention program is highly statistically associated (p-value=.000) with preventing pressure sores among the patients with Paraplegia.

Table 3. Bladder Management

Mean and Standard Deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Bladder Management Pre-Interventions	.2639	36	.29776	.04963
	Bladder Management Post-Intervention	1.9262	36	.47000	.07833

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Bladder Management Pre – Intervention Bladder Management Post-Intervention	-1.66235	.52438	.08740	-1.83977	-1.48492	-19.021	35	.000

Bladder management for the patient with Paraplegia is a matter of great concern. The paired samples test states that t-score of 19.02 with 35 degree of freedom, nursing intervention program is highly statistically associated (p-value= .000) with bladder management among the patients with Paraplegia.

Table 4. Mobility

Mean and Standard Deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Mobility Transfers and wheel chair skills Pre-Intervention	.2121	36	.27229	.04538
	Mobility Transfers and wheel chair skills Post-Intervention	2.1341	36	.41345	.06891

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Mobility Transfers and wheel chair skills Pre-Intervention Mobility Transfers and wheel chair skills Post-Intervention	-1.92197	.51786	.08631	-2.09719	-1.74675	-22.268	35	.000

Under the mobility, transfers and wheel chair skills can be equipped with the implementation of nursing intervention program. The paired samples test states that t-score of 22.27 with 35 degree of freedom, nursing intervention program is highly statistically significant (p-value= .000) with the transfers and wheel chair skills among the patients with Paraplegia.

5. DISCUSSION

In a study, "Effect of Comprehensive Nursing on Traumatic Paraplegia Patients by Evaluation of Magnetic Resonance Imaging Features," underscores the positive impact of comprehensive nursing interventions on patients with traumatic paraplegia (TP). In this study, the Omaha system-based comprehensive nursing approach was compared with routine nursing, focusing on various aspects of patients' well-being (Xiang et al., 2022). The findings from the literature align with the post-intervention results of our study in skin management. Both studies emphasize the positive impact of

nursing interventions, particularly comprehensive and Omaha system-based approaches, on improving the independence and overall well-being of paraplegic patients. In our study, the post-intervention analysis revealed increased independence in tasks related to skin management, aligning with the literature's emphasis on improved scores in skin-related domains. The cumulative mean and standard deviation values in our study support the notion that nursing interventions play a significant role in enhancing patients' self-care skills, reducing dependence, and positively influencing clinical outcomes. This alignment with existing literature strengthens the evidence for the effectiveness of comprehensive nursing interventions in skin management for paraplegic patients. The holistic approach, as discussed in both studies, contributes not only to physical improvements but also to the overall quality of life and caregiving experiences. The comprehensive nursing model, as presented in the literature, serves as a valuable reference point and validation for the positive impact observed in our study.

In comparing our findings on bladder management interventions with the existing literature, similarities in the focus on comprehensive rehabilitation strategies emerge. An existing study, titled "Comprehensive Rehabilitation of Post-Operative Paraplegic Patient: A Case Report," provides insights into the challenges faced by spinal cord injury (SCI) patients, emphasizing the impact on physical, social, and psychological aspects of their lives (Upganlawar et al., 2022). Both studies emphasize the critical role of early physiotherapy and targeted interventions in improving outcomes for individuals with paraplegia. Our post-intervention findings align with the literature's emphasis on early physiotherapy participation to address neurogenic bowel and bladder issues. Our study, through targeted physiotherapy interventions, aims to enhance bladder management and overall independence for patients with paraplegia. The alignment in the focus on physiotherapy as a cornerstone in the recovery process strengthens the evidence for the positive impact of such interventions on bladder management and, consequently, the overall well-being of individuals with paraplegia.

The preceding study, "rehabilitation for patients with paraplegia," provides a comprehensive overview of the challenges associated with paraplegia resulting from spinal cord injury (SCI). Emphasizing the interdisciplinary nature of rehabilitation, the study underscores the significance of addressing various complications, including neurogenic bladder, bowel issues, pressure ulcers, and psychological disorders (Üniversitesi et al., 2021). Comparing our findings with the existing literature, both studies converge on the interdisciplinary approach to rehabilitation for individuals with paraplegia. The emphasis on addressing mobility, transfers, and wheelchair skills resonates in both contexts, signifying the universal importance of these aspects in enhancing the lives of individuals with SCI. Our study contributes by providing specific insights into the post-nursing intervention outcomes related to mobility. By showcasing improvements in mobility skills and transfers, our findings reinforce the positive outcomes achievable through targeted nursing interventions in conjunction with the broader rehabilitation team.

6. CONCLUSION

The effectiveness of nursing interventions is evident in the positive shifts observed across bladder and skin management and mobility. The tailored and holistic approach of nursing care has proven instrumental in improving skills, fostering independence, and enhancing the overall well-being of individuals with paraplegia. These findings underscore the crucial role of nursing interventions in optimizing the quality of life for this population and emphasize the need for continued and targeted support in various aspects of their lives.

The holistic approach to care for individuals with paraplegia is paramount in recognizing and addressing the diverse challenges spanning physical, psychological, and social dimensions. This study underscores the interconnectedness of these aspects, emphasizing that effective interventions must extend beyond isolated domains. By acknowledging the multidimensional nature of the challenges faced by individuals with paraplegia, healthcare strategies can be tailored to provide comprehensive support. The need for a holistic approach becomes apparent in fostering not only physical independence but also promoting psychological well-being and facilitating meaningful

social engagement. Such an approach ensures a more nuanced and effective response to the diverse needs of this population, ultimately contributing to an enhanced quality of life.

7. RECOMMENDATIONS

Personalized Care Plans: Healthcare practitioners should embrace a personalized approach to care, recognizing the unique needs and circumstances of each individual with paraplegia. Tailoring care plans to address specific challenges identified in this study, such as bladder and bowel management techniques and mobility skills, can enhance the effectiveness of nursing interventions.

- **Continuous Monitoring:** Implementing systems for continuous monitoring of individuals' progress and adjusting care plans accordingly is crucial. Regular assessments can ensure that interventions remain aligned with the evolving needs of individuals with paraplegia, fostering sustained improvements in their quality of life.
- **Interdisciplinary Collaboration:** Collaboration among healthcare professionals from various disciplines is essential. Integrating expertise from nursing, physical therapy, psychology, and other relevant fields can provide holistic care that addresses both physical and psychological dimensions.
- **Resource Allocation:** Policymakers should consider allocating resources to support training programs for healthcare professionals specializing in paraplegia care. This includes funding for ongoing education and skill development to ensure practitioners stay abreast of the latest advancements and evidence-based practices.
- **Incentives for Holistic Care:** Developing incentives for healthcare facilities and professionals that adopt a holistic care approach can encourage the integration of comprehensive interventions. Recognizing and rewarding institutions that prioritize the overall well-being of individuals with paraplegia can contribute to the broader adoption of effective practices.
- **Telehealth Integration:** Policymakers should explore policies that facilitate the integration of telehealth solutions in nursing interventions. This can improve accessibility to care, especially for individuals in remote or underserved areas, and enhance the continuity of support beyond traditional healthcare settings.

Acknowledgement: I acknowledge and recognize the valuable guideline of the Ms. Hajra Sarwar (Assistant Professor, Lahore School of Nursing, University of Lahore) and Mr. Sarfraz Masih (Associate Professor, Lahore School of Nursing, University of Lahore) which proved very instrumental to execute this productive study.

Conflict: None

Source of Funding: None

References

1. Albu, S., Kumru, H., Coll, R., Vives, J., Vallés, M., Benito-Penalva, J., Rodríguez, L., Codinach, M., Hernández, J., Navarro, X., & Vidal, J. (2021). Clinical effects of intrathecal administration of expanded Wharton jelly mesenchymal stromal cells in patients with chronic complete spinal cord injury: a randomized controlled study. *Cytotherapy*, *23*(2), 146–156.
2. Ali, Y. K., Mahmoud, F. H., & Hassan, S. N. (2022). Assessment of Nurses' Performance Regarding Care of Patients with Spinal Cord Injury. *The Egyptian Journal of Hospital Medicine, 89*(1), 5721-5727.
3. De Araújo, A. V. L., Neiva, J. F. d. O., Monteiro, C. B. d. M., & Magalhães, F. H. (2019). Efficacy of virtual reality rehabilitation after spinal cord injury: a systematic review. *BioMed research international, 2019*.

4. Dewan, M. C., Rattani, A., Baticulon, R. E., Faruque, S., Johnson, W. D., Dempsey, R. J., . . . Warf, B. C. (2018). Operative and consultative proportions of neurosurgical disease worldwide: estimation from the surgeon perspective. *Journal of neurosurgery, 130*(4), 1098-1106.
5. Henn, M., Mji, G., & Visagie, S. (2009). *Evaluation of the rehabilitation program for persons with complete paraplegia at Netcare rehabilitation hospital.* Stellenbosch: University of Stellenbosch.
6. Li, Y., Chien, W. T., & Bressington, D. (2020). Effects of a coping-oriented supportive programme for people with spinal cord injury during inpatient rehabilitation: a quasi-experimental study. *Spinal Cord, 58*(1), 58-69.
7. Mason, J., Hanson, C., Fox, E. J., Burns, H., Joseph, J., Horwitz, H., & Classen, S. (2024). Perceptions of autonomous shuttles for adults with spinal cord injuries. *OTJR: Occupation, Participation and Health, 44*(1), 47–56.
8. Mehmood, F., Shahzad, Y., Shah, M. M., Akhtar, N., Hashmi, F., & Badar, D. (2022). A Descriptive Study on Patterns of Traumatic Spinal Injuries in a Tertiary Care Hospital Rawalpindi. *Journal of Rawalpindi Medical College, 26*(1), 24-29.
9. Mutepfa, A. R., Hardy, J. G., & Adams, C. F. (2022). Electroactive scaffolds to improve neural stem cell therapy for spinal cord injury. *Frontiers in Medical Technology, 4*.
10. Qiang, L., Piermarini, E., & Baas, P. W. (2019). New hypothesis for the etiology of SPAST-based hereditary spastic paraplegia. *Cytoskeleton, 76*(4), 289-297.
11. Swaffield, E., Cheung, L., Khalili, A., Lund, E., Boileau, M., Chechlacz, D., . . . Gauthier, C. (2022). Perspectives of people living with a spinal cord injury on activity-based therapy. *Disability and rehabilitation, 44*(14), 3632-3640.
12. Toupenet Marchesi, L., Leblanc, M., & Stevanin, G. (2021). Current Knowledge of Endolysosomal and Autophagy Defects in Hereditary Spastic Paraplegia. *Cells, 10*(7), 1678.
13. Wade, D. T. (2020). What is rehabilitation? An empirical investigation leading to an evidence-based description (Vol. 34, pp. 571-583): SAGE Publications Sage UK: London, England.
14. Williams, T. L., Smith, B., & Papathomas, A. (2018). Physical activity promotion for people with spinal cord injury: physiotherapists' beliefs and actions. *Disability and rehabilitation, 40*(1), 52-61.
15. Upganlawar, D., Harjpal, P., Samal, S. S., & Patel, L. (2022). Comprehensive rehabilitation of post-operative paraplegic patient: A case report. Cureus, 14(10). https://doi.org/10.7759/cureus.30446
16. Üniversitesi, B., Fakültesi, T., Tedavi, F., Rehabilitasyon, V., & Dalı, A. (2021). Rehabilitation for patients with paraplegia. Com.Tr. Retrieved January 22, 2024, from https://cms.galenos.com.tr/Uploads/Article_28125/jtss-27-185-En.pdf
17. Xiang, R., Xu, F., Yin, Z., Ji, L., & Xu, Q. (2022). Effect of comprehensive nursing on traumatic paraplegia patients by evaluation of magnetic resonance imaging features. Contrast Media & Molecular Imaging, 2022, 1–11. https://doi.org/10.1155/2022/4712797
18. Zeb, A. (2020). Outcome of Physical Rehabilitation Interventions in Persons with Post-Traumatic Spinal Cord Injuries at Paraplegic Centre Peshawar. *Pakistan. Journal of Physical Medicine Rehabilitation Studies & Reports. SRC/JPMRS/128. DOI: doi. org/10.47363/JPMRS/2020 (2), 123*, 2-4.
19. Zhou, F., Tao, X., Wang, L., Shen, B., & Fang, H. (2023). Effects of "two-heart" nursing mode on the psychological state and quality of life of stroke patients. BMC Neurology, 23(1). https://doi.org/10.1186/s12883-023-03439-5