EFFECTS OF NURSE- LED HIGH AND LOW INTENSITY REHABILITATION APPROACHES ON QUALITY OF LIFE IN PATIENTS WITH GUILLAIN BARRE SYNDROME

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ABSTRACT

Guillain–Barré Syndrome (GBS) is an acute immune-mediated neuropathy that leads to rapidly progressive weakness, sensory loss, and reduced functional independence, significantly affecting quality of life. Despite advances in acute treatment, many survivors experience persistent motor deficits, fatigue, and psychosocial challenges, especially in low-resource settings. Rehabilitation plays a critical role in recovery; however, evidence remains limited regarding the comparative effectiveness of high- versus low-intensity nurse-led rehabilitation programs. Nurses are central to patient assessment, monitoring, and individualized rehabilitation planning, yet the optimal intensity of such interventions is not clearly established. This study aims to evaluate the effects of high- and low-intensity nursing rehabilitation on the quality of life of GBS patients, with the goal of providing evidence-based guidance to improve functional recovery, emotional well-being, and daily living outcomes.

Objective: To determine the effects of the Nurse- led high & low intensity rehabilitation on quality of life among Guilin -Barre syndrome patients.

Methodology: A quasi-experimental pre- and post-study design was used to evaluate the effects of nurse-led high- and low-intensity rehabilitation on the quality of life of Guillain–Barré Syndrome (GBS) patients. A total of 40 confirmed GBS patients were selected through convenience sampling at Lahore General Hospital (PINS) from June to December 2025. Data were collected using a structured demographic form and the validated WHOQOL-BREF scale, which measured physical, psychological, social, and environmental domains. The intervention was delivered in two phases, beginning with low-intensity rehabilitation followed by high-intensity nursing-led exercises and psychosocial support. Pre- and post-intervention quality-of-life scores were compared using nonparametric tests in SPSS version 22, with statistical significance set at $p < 0.05$. This methodological approach ensured a systematic assessment of the impact of rehabilitation intensity on patient outcomes.

Results: A total of 40 participants were included, most of whom were aged 35–45 years (60%) and female (60%). Normality testing using the Shapiro–Wilk test showed that both pre- and post-intervention QOL scores were not normally distributed ($p < 0.001$), leading to the use of non-parametric analysis. Following the nurse-led rehabilitation program, categorical QOL levels improved markedly, with poor QOL decreasing from 42.5% to 5%, and good QOL increasing from 0% to 7.5%. The Mann–Whitney U test revealed a significant improvement in overall QOL, with the post-intervention mean rank (48.86) higher than the pre-intervention mean rank (32.14) ($U = 465.500$, $p < 0.001$), demonstrating the effectiveness of both high- and low-intensity nurse-led rehabilitation in enhancing quality of life among GBS patients.

Conclusion: The study concludes that the WHO-based nursing intervention significantly enhanced

patients' daily functioning, reduced pain, and improved overall quality of life following hip surgery. These findings highlight the importance of structured rehabilitation and nurse-led guidance in promoting faster recovery and better postoperative outcomes. The intervention model can be effectively integrated into routine clinical practice to strengthen patient-centered care.

Keywords: Hip surgery, WHO module, nursing intervention, daily activities, pain management, quality of life, rehabilitation

INTRODUCTION

Guillain–Barré Syndrome (GBS) is an acute, immune-mediated polyradiculoneuropathy characterized by rapidly progressive, symmetrical limb weakness, sensory disturbances, and autonomic dysfunction (Leonhard et al., 2019). Initially described in 1916, GBS remains the leading cause of acute flaccid paralysis globally, with an annual incidence of 1–2 per 100,000 individuals (Singh, Regmi et al., 2024). Although it can affect individuals of all ages, adults and the elderly are at higher risk, and men are slightly more susceptible than women. The disease manifests with ascending weakness, tingling, numbness, and, in severe cases, respiratory compromise due to involvement of cranial and respiratory muscles (Rostami, Tahernia et al., 2022). These impairments not only limit mobility but also adversely affect activities of daily living (ADLs), social participation, and overall quality of life (Sheriff, 2019).

Despite advances in acute medical management, such as intravenous immunoglobulin and plasma exchange, many GBS survivors continue to experience persistent motor deficits, fatigue, and psychosocial challenges (Raposo, Freire et al., 2019). Long-term outcomes vary widely, with 70% of patients achieving full recovery, whereas others endure residual weakness or disability that can last for years (Sugumar, Chidambaram et al., 2022). In Pakistan and other South Asian countries, the prevalence and clinical subtypes of GBS closely resemble global patterns, with Acute Inflammatory Demyelinating Polyneuropathy (AIDP) being the most common form (Iqbal, Asad et al., 2021; Kapoor, Dogra et al., 2019). The persistence of functional limitations, fatigue, and psychosocial disturbances underscores the need for structured rehabilitation strategies to restore independence and enhance quality of life.

Rehabilitation for GBS involves a combination of physiotherapy, occupational therapy, and psychosocial support, delivered according to patient tolerance and clinical needs (Nikolovska, Ismani et al., 2023). Exercise interventions, whether supervised or unsupervised, have demonstrated potential benefits in improving muscle strength, mobility, and reducing fatigue (Shah, Shrivastava et al., 2022). However, evidence regarding the optimal intensity of rehabilitation whether high-intensity, structured programs or low-intensity, gradual interventions remains limited, particularly in the context of nursing-led care (Lo et al., 2022; Chen et al., 2023). This knowledge gap is critical because rehabilitation intensity may influence not only physical recovery but also emotional well-being, psychosocial adjustment, and reintegration into daily life.

Nurses play a pivotal role in designing, implementing, and monitoring rehabilitation programs for GBS patients. Their responsibilities include assessing patient readiness, managing fatigue, providing motivational support, and coordinating multidisciplinary care (Hernandez et al., 2023). Tailored nursing interventions that consider individual patient needs and resource availability have the potential to optimize functional recovery and improve quality of life outcomes. High-intensity nursing rehabilitation may accelerate mobility restoration and independence in ADLs, while low-intensity approaches may be more feasible in resource-limited settings and beneficial for psychological adaptation (Kuwabara & Isose, 2022).

Given the persistent challenges faced by GBS patients, this study aims to investigate the differential effects of nurse-led high- and low-intensity rehabilitation programs on quality of life. By focusing on

patient-centered outcomes, the research seeks to provide evidence-based guidance for nursing practice, inform standardized rehabilitation protocols, and support the development of holistic strategies to enhance functional recovery, emotional resilience, and social reintegration among individuals living with GBS (Deng et al., 2023). Addressing this gap is particularly relevant in low-resource settings, where tailored nursing interventions can play a transformative role in long-term patient care.

STUDY OBJECTIVES

To determine the effects of the Nurse- led high & low intensity rehabilitation on quality of life among Guilin -Barre syndrome patients.

METHDOLOGY

A quasi-experimental pre- and post-study design was used to evaluate the effects of nurse-led high- and low-intensity rehabilitation on the quality of life of Guillain–Barré Syndrome (GBS) patients. A total of 40 confirmed GBS patients were selected through convenience sampling at Lahore General Hospital (PINS) from June to December 2025. Data were collected using a structured demographic form and the validated WHOQOL-BREF scale, which measured physical, psychological, social, and environmental domains. The intervention was delivered in two phases, beginning with low-intensity rehabilitation followed by high-intensity nursing-led exercises and psychosocial support. Pre- and post-intervention quality-of-life scores were compared using nonparametric tests in SPSS version 22, with statistical significance set at $p < 0.05$. This methodological approach ensured a systematic assessment of the impact of rehabilitation intensity on patient outcomes.

RESULTS

Table 1: Demographic Characteristics of Participants (N = 40)

Variable	Category	N	%
Age (years)	35–45	24	60.0
	46–50	12	30.0
	More than 50	4	10.0
Marital Status	Married	28	70.0
	Single	4	10.0
	Widowed	4	10.0
	Divorced	4	10.0
Department	Inpatient Department	4	10.0
	Intensive Care Unit (ICU)	36	90.0
Gender	Male	16	40.0
	Female	24	60.0
Education Level	Primary School	4	10.0
	High School	4	10.0
	Intermediate	16	40.0
	Graduate	12	30.0
	Postgraduate	4	10.0
Area of Residence	Urban	28	70.0
	Rural	12	30.0

Table 1 summarizes the demographic profile of the 40 participants included in the study. Most participants (60%) were aged between 35 and 45 years, while 30% were 46–50 years old, and 10% were above 50 years. The majority were married (70%), with single, widowed, and divorced participants each making up 10%. A large proportion (90%) were working in the Intensive Care Unit, whereas 10% belonged to the Inpatient Department. Females represented 60% of the sample, and males 40%. In terms of education, 40% had completed intermediate studies, 30% were graduates, and smaller groups held primary (10%), high school (10%), or postgraduate (10%) qualifications. Additionally, 70% of the participants lived in urban areas, while 30% were from rural regions. Overall, the findings highlight a predominantly urban-based, well-educated, and professionally diverse nursing group.

Table 2: Tests of Normality for Pre- and Post-Quality of Life Scores (N = 40)

Variable	Kolmogorov–Smirnov	df	Sig.	Shapiro–Wilk	Df	Sig.
Pre-QOL	0.527	40	0.000	0.165	40	0.000
Post-QOL	0.453	40	0.000	0.490	40	0.000

Table 2 shows the results of the Shapiro–Wilk normality test for pre- and post-intervention quality of life (QOL) scores. Given that the sample size was 40, which is less than 50, the Shapiro–Wilk test was considered more appropriate for assessing normality. The results revealed that both pre-QOL and post-QOL data significantly deviated from a normal distribution ($p < .001$), indicating that the data were not normally distributed. Therefore, non-parametric statistical tests were applied for further analysis to evaluate the effectiveness of the intervention accurately.

Table 3: Categorical Comparison of Pre- and Post-Intervention Quality of Life (QOL) of Participants (N = 40)

Quality of Life Category	Pre-Intervention N (%)	Post-Intervention N (%)
Poor Quality of Life	17 (42.5%)	2 (5.0%)
Moderate Quality of Life	23 (57.5%)	35 (87.5%)
Good Quality of Life	0 (0.0%)	3 (7.5%)

Table 3 presents a categorical comparison of the participants' quality of life (QOL) before and after the nurse-led rehabilitation intervention. Prior to the intervention, 42.5% of participants reported a poor quality of life, and 57.5% reported a moderate level, with none indicating a good quality of life. Following the intervention, there was a notable improvement, as only 5% remained in the poor category, while the majority (87.5%) achieved a moderate level, and 7.5% reached a good quality of life. These findings suggest that the nurse-led rehabilitation program substantially enhanced participants' overall quality of life.

Table 4: Comparison of Pre- and Post-Intervention Quality of Life (QOL) Using Mann–Whitney U Test

Variable	Pre-Intervention (Mean Rank)	Post-Intervention (Mean Rank)	Mann–Whitney U	p-value
Quality of Life (QOL)	32.14	48.86	465.500	0.000

Table 4 illustrates the comparison of pre- and post-intervention Quality of Life (QOL) scores using the Mann–Whitney U test. The post-intervention group demonstrated a higher mean rank (48.86) compared to the pre-intervention group (32.14), indicating an overall improvement in participants' quality of life following the nurse-led rehabilitation program. The Mann–Whitney U value of 465.500 with a p-value of 0.000 (< 0.05) confirms a statistically significant difference between the two phases. This result highlights the effectiveness of the intervention in enhancing the quality of life among patients with Guillain-Barré Syndrome.

DISCUSSION

Demographic Characteristics of Participants

The demographic profile of the study participants reflects a well-balanced and experienced nursing workforce, predominantly composed of individuals aged 35–45 years (60%), married (70%), and primarily employed in the Intensive Care Unit (90%). This distribution aligns with the findings of Shakya et al. (2022), who emphasized that nurses in this age group typically exhibit higher professional maturity, clinical competence, and adaptability to complex care situations such as the management of Guillain-Barré Syndrome (GBS). However, Rao et al. (2023) reported differing results, suggesting that younger nurses (below 30 years) often demonstrate higher enthusiasm and adaptability to new rehabilitation technologies, which may enhance innovation in patient care. This contradiction highlights the complementary value of both age groups experienced nurses bring clinical judgment, while younger nurses contribute technological adaptability. The predominance of married nurses further supports the results of Ali et al. (2023), who found that marital stability enhances emotional resilience and patient-centered commitment key factors in improving rehabilitation outcomes.

Educationally, most participants had intermediate (40%) or graduate (30%) qualifications, consistent with Rizvi and Khan (2021), who linked mid-level education with strong clinical engagement and hands-on skills. Yet, Yasmeen et al. (2023) contradicted these findings by demonstrating that postgraduate nurses exhibit superior critical thinking, leadership, and evidence-based practice implementation in rehabilitation settings. The limited number of postgraduate nurses (10%) in the present study thus underscores a gap in advanced nursing education within Pakistan's healthcare system and the need for stronger professional development initiatives. However, the limited number of postgraduate nurses (10%) contrasts with findings from Thompson et al. (2022), who reported that advanced nursing education enhances evidence-based decision-making and leadership inpatient rehabilitation. This discrepancy underscores the need for expanded opportunities in postgraduate nursing education and continuing professional development within Pakistan's healthcare system.

Furthermore, the predominance of urban participants (70%) aligns with Hassan et al. (2022), who identified urban healthcare centers as key attractors for skilled nurses due to better infrastructure, career advancement opportunities, and exposure to diverse clinical cases. The smaller representation of rural nurses (30%) reflects ongoing disparities in healthcare workforce distribution and access to professional growth. In contrast, Begum and Shah (2023) highlighted that rural nurse often display higher dedication and community-based problem-solving skills despite resource limitations, suggesting that rural healthcare environments foster resilience and adaptability. The smaller representation of rural nurses (30%) in this study therefore reflects systemic inequities in workforce distribution and access to continuing education.

Collectively, these demographic insights highlight a capable and clinically active nursing population that serves as a strong foundation for implementing nurse-led high- and low-intensity rehabilitation interventions for GBS patients. Strengthening rural participation and postgraduate training remains essential to ensure equitable, evidence-based, and sustainable rehabilitation care across all healthcare settings.

Categorical Comparison of Pre- and Post-Intervention Quality of Life (QOL) of Participants

The comparison of pre- and post-intervention Quality of Life (QOL) scores among patients with Guillain-Barré Syndrome (GBS) demonstrates a remarkable enhancement following the nurse-led high- and low-intensity rehabilitation program. Prior to the intervention, 57.5% of participants reported a moderate QOL, 42.5% experienced poor QOL, and none reported a good QOL. Post-intervention findings, however, revealed a significant shift, with poor QOL declining to 5%, moderate QOL increasing to 87.5%, and good QOL emerging at 7.5%. This transition underscores the efficacy of nurse-led rehabilitation in improving not only physical recovery but also emotional and social dimensions of well-being among GBS patients.

Comparable findings were reported by Al-Hashel et al. (2023) are align with present study, who demonstrated that structured rehabilitation interventions notably enhance muscle strength, mobility, and overall satisfaction within two months of treatment among GBS patients. Likewise, Khan et al. (2022) identified that participants exposed to nurse-led, comprehensive rehabilitation showed greater independence in performing daily activities and improved quality of life relative to those receiving routine care. The consistent improvement observed in this study may be attributed to sustained nurse engagement through personalized physiotherapy, emotional encouragement, and continuous education, which collectively foster motivation and adherence to rehabilitation goals.

In contrast, Sajid et al. (2021) reported slower QOL recovery in facilities with limited supervision or inconsistent rehabilitation intensity, reinforcing the importance of structured and consistent nurse-led programs. The combination of high- and low-intensity interventions used in this study likely contributed to balanced recovery by tailoring therapy to patients' tolerance and progress levels.

Furthermore, the present findings align with the World Health Organization's (2023) Rehabilitation 2030 framework, which emphasizes that patient-centered, multidisciplinary rehabilitation plays a central role in restoring functional independence and improving quality of life. The continuous support and monitoring by nurses not only ensured clinical compliance but also addressed the psychosocial needs of patients, an essential yet often underrecognized component of recovery.

In conclusion, this study validates the growing body of evidence supporting the effectiveness of nurse-led rehabilitation in transforming QOL outcomes among GBS patients. The results advocate for the integration of structured, intensity-based nursing interventions within hospital rehabilitation units, especially in resource-limited settings like Pakistan, to promote holistic and sustainable recovery.

Comparison of Pre- and Post-Intervention Quality of Life (QOL)

The Mann–Whitney U test results demonstrate a statistically significant improvement in the Quality of Life (QOL) among patients with Guillain-Barré Syndrome (GBS) following the implementation of a nurse-led rehabilitation intervention ($U = 465.500$, $p = 0.000$). The post-intervention mean rank (48.86) was markedly higher than the pre-intervention mean rank (32.14), indicating that the intervention had a strong positive impact on participants' overall well-being. These findings affirm that structured, nurse-led high- and low-intensity rehabilitation programs substantially enhance patients' physical recovery, psychological stability, and social reintegration.

The results are consistent with those of Al-Hashel et al. (2023), who observed significant improvements in functional mobility and emotional health among GBS patients undergoing structured multidisciplinary rehabilitation. Likewise, Khan et al. (2022) reported that nurse-led rehabilitation programs facilitated greater independence in daily living activities and emotional adjustment compared to conventional physiotherapy, emphasizing the essential role of nursing supervision in the rehabilitation process.

Similarly, a study conducted in China by Li et al. (2023) found that continuous, structured rehabilitation under nurse supervision improved overall QOL and reduced relapse-related anxiety among patients with peripheral neuropathies, including GBS. Rahman et al. (2021) also highlighted the critical influence of sustained follow-up, patient engagement, and individualized rehabilitation plans under nursing guidance, which collectively contributed to long-term improvements in QOL outcomes.

In contrast, Sajid et al. (2021) reported limited progress in QOL among GBS patients in resource-constrained healthcare environments, where rehabilitation programs were irregular and lacked adequate monitoring. This discrepancy suggests that the intensity, frequency, and continuity of nursing interventions are key determinants of rehabilitation success.

The statistically significant p-value (<0.05) supports the rejection of the null hypothesis, affirming that the observed improvement was not due to random variation but resulted from the structured intervention. Collectively, the evidence reinforces that nurse-led rehabilitation serves as a cornerstone in optimizing recovery, fostering autonomy, and improving long-term QOL among GBS patients. These findings highlight the necessity of integrating structured, evidence-based nursing interventions into routine neurorehabilitation practices, particularly in developing regions such as Pakistan, where the availability of specialized rehabilitation services remains limited.

CONCLUSION

This study concluded that nurse-led high- and low-intensity rehabilitation interventions effectively enhanced the quality of life of patients with Guillain-Barré Syndrome by improving their physical, psychological, and social well-being. Through structured, continuous, and patient-centered care, nurses played a pivotal role in restoring independence, confidence, and functional recovery. The findings align with contemporary evidence underscoring the effectiveness of nursing-led rehabilitation in promoting long-term recovery and emotional stability compared to conventional physiotherapy approaches.

These results highlight the necessity of integrating nurse-led rehabilitation models into healthcare systems, especially in resource-limited settings like Pakistan. Strengthening nurses' competencies through specialized training and evidence-based practice can improve neurorehabilitation outcomes and ensure sustainable, high-quality care. Overall, this study reaffirms the transformative potential of nurse-led interventions as a cornerstone of holistic, patient-centered rehabilitation, contributing to improved quality of life and advancing global standards in neurological care.

LIMITATIONS OF THE STUDY

- The study was conducted with a small sample size (N = 40) from a single healthcare facility, limiting the generalizability of the findings to other populations or settings.
- The absence of a control group restricts the ability to draw firm causal conclusions about the effectiveness of the nurse-led intervention.
- The short follow-up period did not allow assessment of the long-term sustainability of quality-of-life improvements.
- The study relied on self-reported measures, which may be subject to bias or inaccuracies in participants' responses.
- Institutional and environmental factors, such as differences in staffing levels or available resources, may have influenced the outcomes.
- The study did not control for potential confounding variables such as disease severity, comorbidities, or socioeconomic status, which could have impacted recovery.

SUSTAINABILITY OF THE STUDY

- The nurse-led rehabilitation model demonstrated in this study is inherently sustainable, as it utilizes existing nursing resources and can be integrated into routine clinical practice without significant additional costs.
- The training and empowerment of nurses in delivering both high- and low-intensity rehabilitation foster long-term capacity building within the healthcare system.
- The intervention promotes continuity of care, enabling nurses to provide ongoing monitoring, education, and motivation to patients, which supports lasting improvements in quality of life.
- The structured, evidence-based approach aligns with WHO's Rehabilitation 2030 framework, ensuring global relevance and adaptability across diverse healthcare contexts.
- The model can be scaled and adapted to other neurological or chronic conditions, enhancing its long-term impact on patient recovery and health system efficiency.
- By emphasizing multidisciplinary collaboration and patient-centered care, the study supports a sustainable shift toward integrated rehabilitation practices in both urban and resource-limited settings.

RECOMMENDATIONS

For Patients

- Patients should actively participate in nurse-led rehabilitation programs to improve their physical strength, mental health, and social functioning.
- They must consistently follow prescribed rehabilitation exercises and attend follow-up sessions to ensure steady recovery and prevent relapse.
- Patients should be motivated to adopt self-care habits and lifestyle changes that promote independence and enhance their overall quality of life.

For the Nursing Profession

- Nurses need specialized training in neurorehabilitation, effective communication, and patient education to help patients recover more efficiently from Guillain-Barré Syndrome and related neurological disorders.
- Ongoing professional education and the use of evidence-based practices should be encouraged to keep nurses updated on modern rehabilitation techniques.
- Nurse-led rehabilitation should be made a standard part of nursing education and hospital practice to strengthen nurses' roles in multidisciplinary healthcare teams.

For Administration and Healthcare Policy

- Hospital administrations should provide the necessary resources and infrastructure to establish structured nurse-led rehabilitation programs in neurology and intensive care units.
- Health policies should formally acknowledge and standardize nurse-led rehabilitation practices at both institutional and national levels.
- Coordination among nurses, doctors, and physiotherapists should be improved to ensure holistic and patient-centered care.
- Investments in staff training, adequate workforce, and technology-based rehabilitation tools are needed to ensure the long-term success and sustainability of such programs.

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