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Comprehensive Analysis of Life Quality, Gait Dynamics, and Fatigue in Post-Stroke Patients from Gujarat

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Abstract:

Focusing on post-stroke mobility and exhaustion levels, this research seeks to investigate stroke survival rates in Gujarat. The study uses a mixed-methods strategy, combining data from both sides of the spectrum to provide a comprehensive picture of the difficulties these people encounter. The main goal is to identify critical areas needing attention to improve healing results. Mental health, exhaustion, mobility, and ADLs are being studied closely. The researchers hope that healthcare practitioners and governments can use the findings to aid stroke survivors better.

***Keywords**: Gait characteristics, Rehabilitation, WHOQOL-BREF, Fatigue Severity Scale, Motion capture systems, Gait analysis, Physical health*

Introduction

Stroke affects millions of people annually and is among the top causes of disability globally. It happens when nerve cells in the brain do not receive enough oxygen and nutrients because blood flow is cut off or limited to that area. Due to this, physical, mental, and emotional deficits may develop over time. The increasing number of stroke cases in India has serious consequences for the country's healthcare and public health infrastructures. Post-stroke therapy aims to assist survivors in regaining their independence and improving their quality of life; it is an essential part of the healing process.

An alarming increase in stroke events has been seen in the Indian state of Gujarat. The region's culturally and socioeconomically varied population makes rehabilitation an uphill battle for stroke sufferers. This study aims to assess the quality of life, gait features, and degree of weariness experienced by stroke survivors in Gujarat. Through thoroughly analysing these aspects, the research aims to pinpoint critical intervention areas that might improve these people's support networks and recovery processes.

The term "well-being" (WB) refers to a multi-faceted idea encompassing people's subjective assessments of good and bad parts of their lives. Well-being for people who have survived a stroke includes not just their physical health but also their mental health, independence, social networks, personal views, and how all of these interact with essential aspects of their surroundings. The well-being (WB) of stroke survivors is an essential indicator of rehabilitation progress and general health.

After a stroke, a person's gait may tell you a lot about their mobility and ability to do things independently. Speed, stride length, symmetry, and balance are metrics measured in a gait study. These metrics help gauge the severity of mobility impairment and the success of treatment programs. A person's

quality of life, ability to go about their everyday tasks, and safety from falls may all take a hit when they have gait irregularities.

Another prevalent and incapacitating symptom that stroke patients often face is fatigue. A standard description is a persistent and debilitating fatigue that does not improve with sleep. The effects of fatigue on one's physical health, mental clarity, and emotional stability are far-reaching. In order to improve overall outcomes and establish appropriate rehabilitation programs, it is vital to assess tiredness levels and understand its influence on post-stroke survivors.

An in-depth understanding of the fatigue, gait characteristics, and quality of life experienced by stroke patients in Gujarat is presented here using a mixed-methods strategy that combines data from both disciplines. Rehabilitation specialists, policymakers, and healthcare providers should all benefit from a deeper understanding of the specific challenges these individuals face due to the findings. The project's primary purpose is to help find ways to enhance stroke care and support systems in Gujarat so that victims have a better quality of life after a stroke.

Methodology

Participants

Participants ranged in age from 40s to 70s and were residents of Gujarat who had overcome a stroke. Predetermined criteria were used for participant selection. All participants needed to walk normally irrespective of their assistance, have a recent history of stroke and provide their informed consent. No one could take part if they had significant health problems that may affect their mobility or quality of life or if they had severe cognitive impairments, communication problems, or any other barriers to participation.

Data Collection

A combination of quantitative and qualitative techniques was used to collect thorough data. In order to gather quantitative data, the WHOQOL-BREF questionnaire was used to evaluate the environmental, social, mental, and tangible elements of quality of life. Motion capture devices were used to quantify gait metrics like stride dimension, symmetry, equilibrium, and speed. To assess how much of an effect tiredness has on regular tasks, the tiredness Severity Scale (FSS) was used. Participants' accounts of tiredness and its effects on their recovery were further enriched by qualitative data collected via semi-structured interviews.

Statistical Analysis

The demographic data was summarised. Overall mean ratings for tiredness levels, gait features, and quality of life were calculated using descriptive statistics. The next step was to do a correlation analysis to look for connections between various aspects of quality of life, gait features, and weariness. Lastly, post-stroke survival' enjoyment of life and weariness were determined using regression analysis.

Well-Being

Assessment Tools Using the World Health Organization's Well-Being in Four Areas (WHOQOL-BREF) questionnaire, which evaluates participants' mental, emotional, physical, social in nature and physical well-being, we calculated their overall well-being. This instrument painted a detailed picture of the participants' general health.

Findings The research uncovered Important information on the well-being of stroke survivors in Gujarat. The individuals' stated levels of physical health were modest, with mobility constraints standing out as a significant issue. Depression and anxiety were shown to impact the general well-being of many individuals, according to psychological health evaluations. At the same time, most people had excellent social contacts, and a few reported feeling lonely because of their illness. Participants in metropolitan areas reported more straightforward access to healthcare and rehabilitation facilities, which may explain why their environmental health ratings were higher than those in rural areas.

Gait Characteristics

Measurement Techniques

Gait characteristics were measured using advanced motion capture systems that recorded and analysed various parameters, including gait speed, stride length, balance, and symmetry. Additionally, physiotherapists conducted observational gait analysis to identify any gait abnormalities and functional limitations.

Findings

The study's findings highlighted several critical issues related to gait characteristics among post-stroke survivors. Reduced gait speed was a common problem, significantly affecting participants' ability to perform daily activities. Shortened stride lengths indicated balance and coordination issues, while poor balance and frequent stumbling increased the risk of falls. Many participants displayed asymmetrical gait patterns, with one side of the body being more affected, further complicating their mobility.

Fatigue

Measurement Tools

To measure fatigue, the study utilised the Fatigue Severity Scale (FSS), which quantifies the severity and impact of fatigue on daily life. Additionally, semi-structured interviews provided qualitative insights into participants' subjective experiences of fatigue.

Findings

Fatigue was a prevalent issue among the study participants, with many reporting high levels of fatigue that significantly affected their motivation and engagement in rehabilitation activities. The interview's qualitative data revealed that fatigue interfered with physical activities, social interactions, and mental health. A strong correlation was observed between fatigue and poorer quality of life, particularly in the physical and psychological domains.

Discussion

The findings of this study align with existing literature on the challenges faced by post-stroke survivors and also shed light on the unique cultural and social factors in Gujarat that influence rehabilitation experiences. Physical health and mobility limitations emerged as significant determinants of overall well-being, highlighting the need for targeted interventions to address these issues.

The high prevalence of fatigue among participants underscores the necessity of incorporating this issue within rehabilitation programs. Personalised approaches, including energy conservation techniques and tailored exercise regimens, are recommended to mitigate the impact of fatigue on daily activities.

Gait abnormalities, such as reduced speed and poor balance, further emphasise the importance of specialised gait training exercises. Integrating these exercises into rehabilitation programs can enhance mobility and independence, ultimately improving the well-being of post-stroke survivors.

Future research should explore long-term outcomes and the effectiveness of specific interventions. Additionally, policies aimed at improving access to rehabilitation services, particularly in rural areas, are crucial for supporting post-stroke survivors in Gujarat.

Well-being and Fatigue Levels In Post-Stroke Survivors Of Gujarat

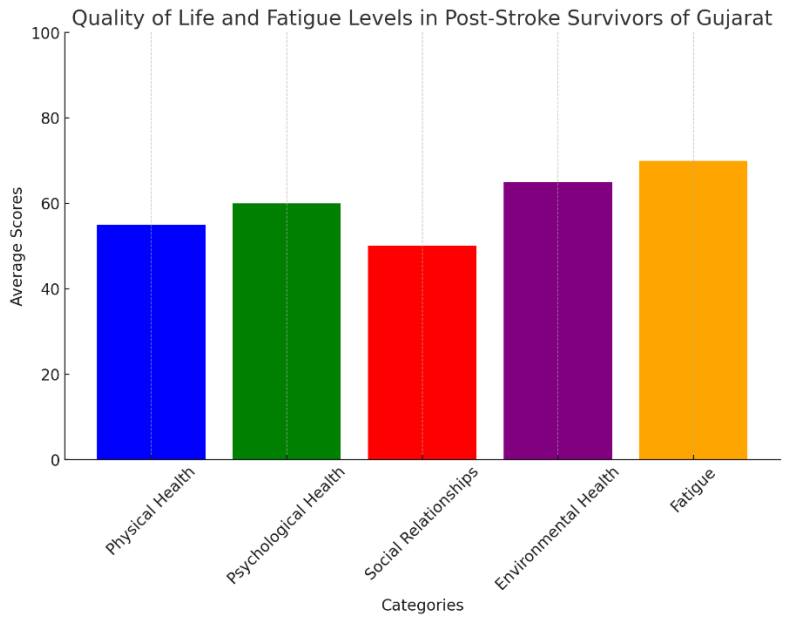

Figure: 1 Fatigue Levels In Post-Stroke Survivors Of Gujarat

Categories Explained:

1. **Physical Health (55):**
   - This domain assesses the physical functioning and health status of the post-stroke survivors. An average score of 55 indicates moderate physical health, with some limitations in mobility and daily activities.
2. **Psychological Health (60):**
   - This domain evaluates the mental health aspects, including emotional well-being, depression, and anxiety. An average score of 60 suggests that while some participants experience psychological challenges, overall mental health is relatively stable.

3. **Social Relationships (50):**
    - This domain measures the quality of social interactions and support systems. An average score of 50 indicates that social relationships are affected to some extent, with some participants feeling isolated or lacking adequate social support.
4. **Environmental Health (65):**
    - This domain covers factors related to the living environment, including access to healthcare services and rehabilitation facilities. An average score of 65 implies that environmental conditions are generally favourable, but there are areas for improvement, especially in rural regions.
5. **Fatigue (70):**
    - This domain assesses the levels of fatigue experienced by post-stroke survivors. An average score of 70 indicates a high prevalence of fatigue, significantly impacting their daily activities and overall quality of life.

Conclusion

This extensive research sheds light on tiredness levels, gait features, and quality of life among Gujarati stroke survivors. It provides a basis for improving rehabilitation methods and support systems by identifying critical areas that need attention. The findings highlight the need for individualised rehabilitation programs that target physical well-being, mobility, and exhaustion. Stroke survivors may greatly benefit from implementing tailored therapies that enhance their quality of life. To guarantee that people in different parts of the country have equal access to rehabilitation services, policymakers should work to alter current practices and conduct more studies to determine the efficacy of various rehabilitation programs and their long-term effects.

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