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## OPTIMIZING QUALITY OF LIFE THROUGH INDIVIDUALIZED REHABILITATION FOR PERSONS WITH DISABILITIES

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### ABSTRACT

*Disability can be described as a physical, mental, or combined condition which limits the person's activities such as walking, talking, hearing etc. Rehabilitation for persons with disabilities must include a range of therapeutic, medical and psychological interventions modified to the specific needs of the individual. The rehabilitation process begins with collecting information from the subject to develop a specialized, individualized rehabilitation plan that will guide the therapist. Emphasis is typically placed on physical therapy and occupational therapy; though other types of therapy are also crucial for the closest possible return of motor function to normal. This research paper is based on interviews conducted with a structured questionnaire and observations of 13 participants diagnosed with cerebral palsy, psycho-physical impairments, paraplegia, or mental retardation combined with autism or epilepsy. Due to vocal and auditory impairments experienced by some subjects, interviews were conducted with their caregivers. Additionally, this research includes literature sourced from internet archives such as PubMed and Internet Archive. Ongoing collaboration between persons with disabilities, their caregivers, and family members is identified as a key factor leading to the improvement of their existing condition.*

**Key words:** rehabilitation; disability; cerebral palsy; psycho - physical disability; paraplegia; mental retardation.

### INTRODUCTION

Disability is a many-sided concept with a range of physical, cognitive, sensory and emotional impairments that impact an individual's ability to function independently in daily life (Berghs et al., 2016). These impairments can become apparent from congenital conditions, developmental disorders, injuries, chronic illnesses or age-related decline, and they vary widely in terms of severity and effect on personal autonomy (Institute of Medicine US, 2001). Rehabilitation plays important role in reducing the impact of disabilities with functional improvement, improving quality of life and promoting social inclusion (Saran et al., 2021). It is not only concerned with restoring lost abilities but also with helping individuals develop

adaptive strategies to maximize their participation in personal, social, and professional spheres (Eriksen et al., 2021).

Rehabilitation practices rely on an interdisciplinary approach, bringing together professionals from different fields such as physical therapy, occupational therapy, speech therapy and psychology (Yunus et al., 2022). Core components like kinesitherapy, massage therapy, and speech therapy are often used alongside other supportive interventions like art and music therapy, reflecting a holistic philosophy aimed at addressing the full spectrum of individual needs (Schneider et al., 2022).

The complexity of disabilities, especially in cases where people experience multiple co-occurring impairments, such as motor dysfunction combined with cognitive challenges necessitates an individualized approach to rehabilitation (Barman et al., 2016; Cantone et al., 2018). Individualized rehabilitation plans take into account not only the nature of the disability but also the development stage of the individual, family dynamics, and environmental context. Early diagnosis and timely intervention are important, as they can improve long-term results and reduce the risk of secondary complications (Zwaigenbaum et al., 2015). In particular, for chronic conditions such as cerebral palsy, autism and paraplegia, rehabilitation is often a long-lasting process that develop to meet changing needs over time (Cieza et al., 2019).

A critical aspect of effective rehabilitation is in collaboration among healthcare workers, caregivers and the individual receiving care. Caregivers, often family members play important role in the progression of care by supporting daily rehabilitation exercises and providing emotional support (Reinhard et al., 2008; Lobo et al., 2023). Rehabilitation also divides with societal issues, such as accessibility and inclusion, focusing on the importance of creating environments that accommodate the different needs of persons with disabilities (Clemente et al., 2022). Through comprehensive rehabilitation programs, persons are not only achieving functional improvements but also to be part of meaningfully in their communities, supporting for a more inclusive society (Wade, 2020).

## **METHODOLOGY**

### *Study Design*

This research used a descriptive observational design, focusing on rehabilitation interventions for persons with disabilities. The study was conducted over a four-month period, from May to September, in the city of Prilep, North Macedonia. A structured questionnaire and direct observations were used to gather data from participants and their caregivers, ensuring a comprehensive understanding of the interventions applied.

### *Participants*

The study involved 13 participants diagnosed with various conditions, including cerebral palsy, paraplegia, psycho-physical impairments, autism, epilepsy, and mental retardation. In cases where participants experienced vocal and auditory impairments, data collection was facilitated through interviews with their primary caregivers to ensure the accuracy and completeness of the information provided.

### *Data Collection Instruments*

A structured questionnaire was developed to capture key demographic information, types of disabilities, and the rehabilitation interventions used. The questionnaire included sections on the timing of diagnosis (prenatal or postnatal), rehabilitation start age, frequency of various therapeutic interventions, and participant involvement in different therapies, including kinesitherapy, medical massage, speech therapy, music therapy, and art therapy.

### *Procedure*

Participants were recruited from rehabilitation centers and local institutions in Prilep. Informed consent was obtained from either the participants or their caregivers. The participants were assured of the confidentiality of their data and the voluntary nature of their involvement. Data collection involved a combination of structured interviews and observational sessions. Interviews focused on gathering personal and medical histories, while observations were used to record the engagement of the participants in therapeutic sessions. The frequency and type of interventions, including the use of music therapy, kinesitherapy, and massage were documented. Questionnaires were distributed and collected in person during scheduled sessions with participants or their caregivers, ensuring immediate clarification of any questions.

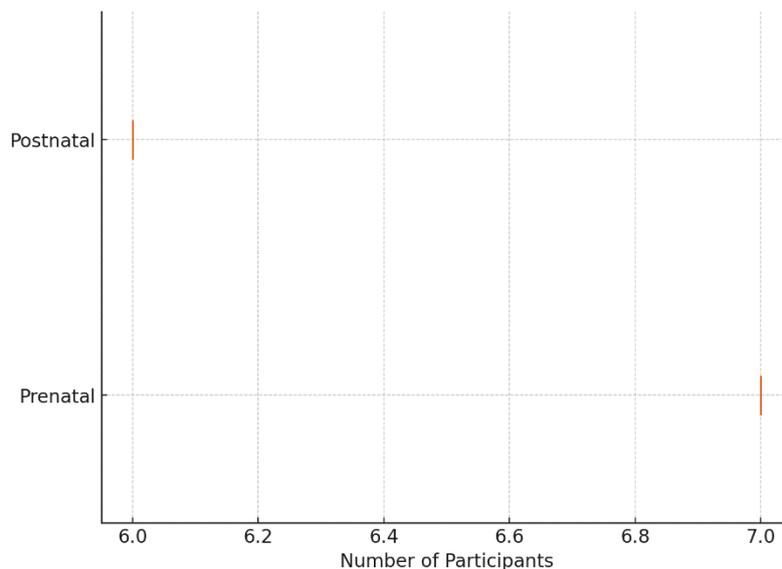
### *Data Analysis*

Data were analyzed using both descriptive and inferential statistical methods to identify patterns in rehabilitation outcomes. Gender distribution, diagnosis period (prenatal vs. postnatal), the prevalence of specific conditions, and the types and frequency of interventions were examined. Means, standard deviations, and percentages were calculated for numerical and categorical variables. The relationship between multiple disabilities and the types of therapies used was also explored to highlight specialized intervention needs.

### *Limitations*

While the sample size of 13 participants provides valuable information into rehabilitation practices, it limits the generalizability of the results. The reliance on caregiver-reported data for some participants introduces potential bias. Additionally, the four-month duration of the study offers only a snapshot of the rehabilitation process, which may require longer follow-up periods to fully assess outcomes.

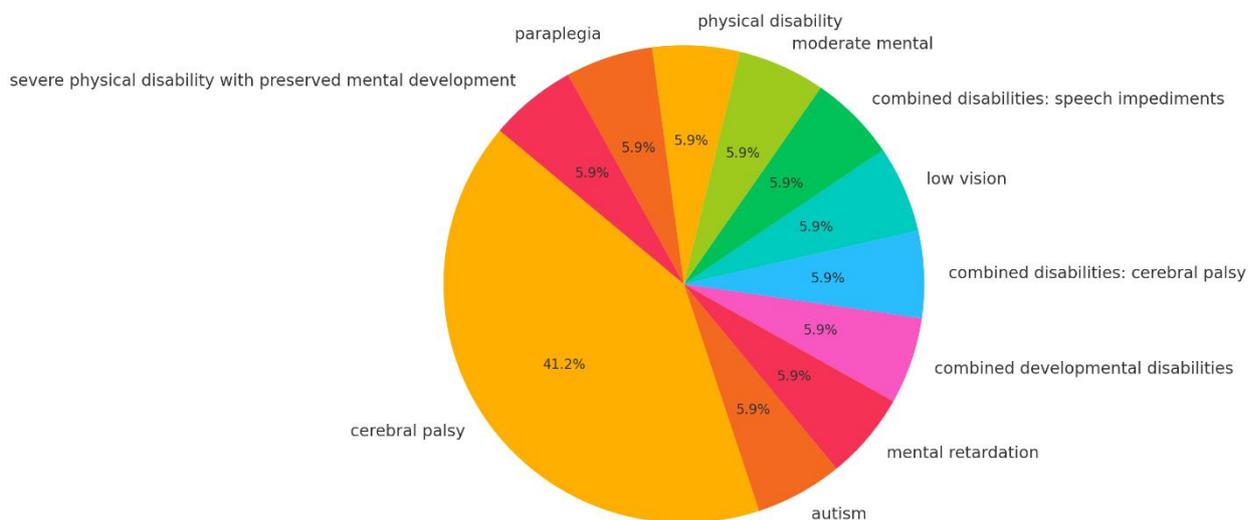
## **RESULTS**



*Figure 1: Distribution of conditions by discovery period.*

Figure 1 shows the distribution of the conditions of participants, categorized by the period of discovery as either prenatal or postnatal. Out of the 13 participants, 53.85% were diagnosed during the prenatal period, while 46.15% were identified postnatally. The mean

number of participants per category is 6.5, with a standard deviation of 0.5, reflecting a relatively balanced distribution between the two periods. The slightly higher prenatal percentage may suggest the importance of early diagnostics in detecting complex motor and developmental conditions, such as cerebral palsy, which was the most prevalent condition in the study.



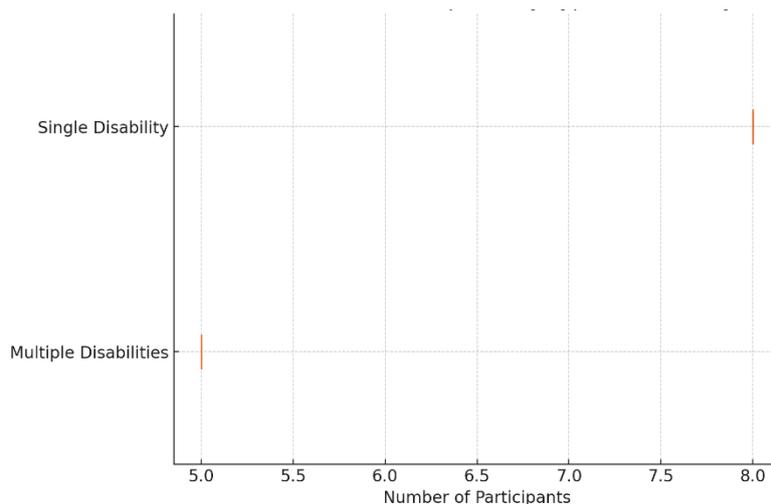
*Figure 2: Distribution of condition types among participants.*

Figure 2 illustrates the distribution of different condition types among the participants. The most prevalent condition is cerebral palsy, with the majority of cases. Other conditions, such as autism, mental retardation, paraplegia, and various combined disabilities (speech impediments, low vision), represent smaller proportions. The dominance of cerebral palsy accents its importance in the study, with focus of the need for interventions for this condition.

*Table 1: Gender distribution among participants.*

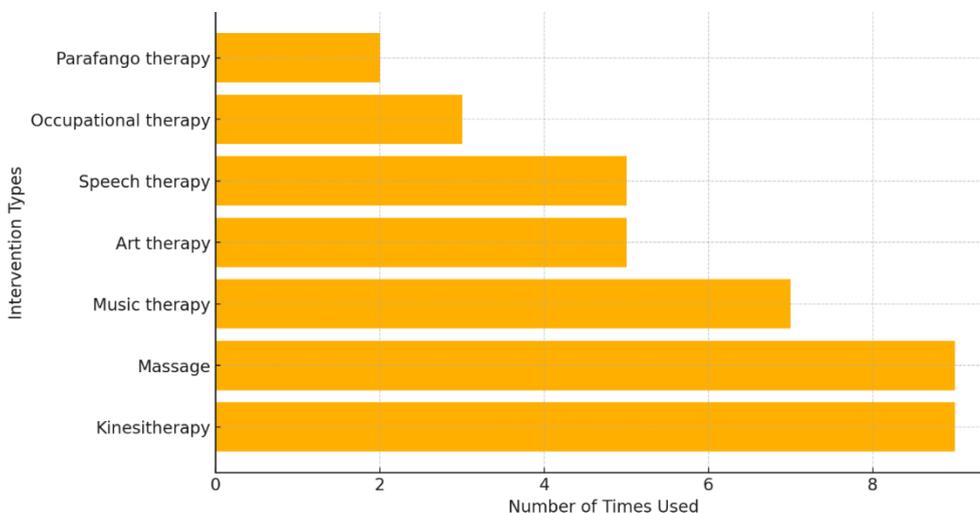
<b>Gender</b>	<b>Count</b>	<b>Percentage</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>Female</b>	9	69.23%	6.5	2.5
<b>Male</b>	4	30.77%	6.5	2.5
<b>Total</b>	13	100%	-	-

Table 1 presents the gender distribution among the participants. Out of the 13 participants, 69.2% are female and 30.8% are male. The average number of participants per gender group is 6.5. This imbalance, with a higher proportion of female participants, shows the composition of the sample.



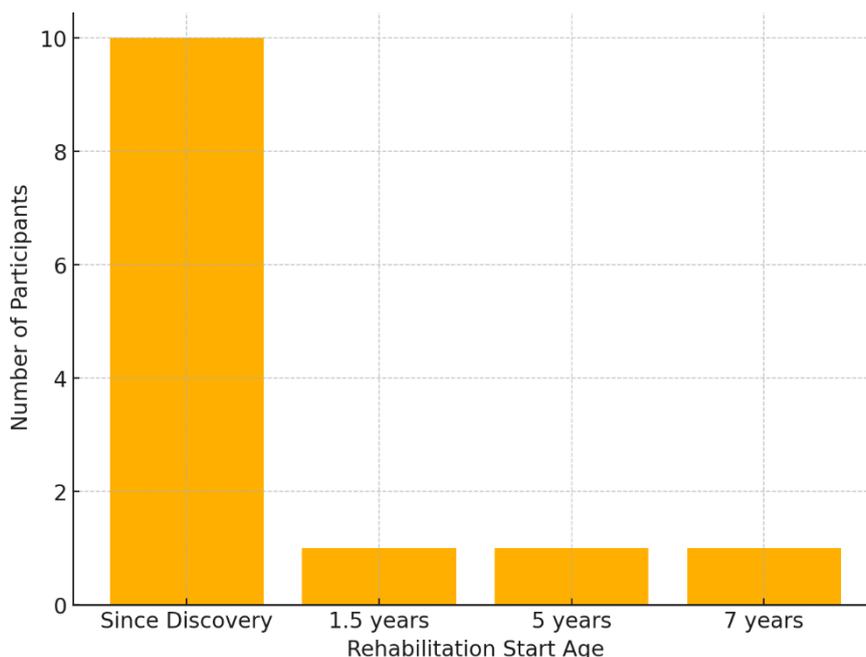
*Figure 3: Distribution of participants by the type of disability.*

Figure 3 visualizes the distribution of participants based on whether they have multiple or single disabilities. Out of the 13 participants, 38.5% have multiple disabilities, while 61.5% have a single disability. The average number of participants per group is 6.5. This distribution shows that more participants exhibit single disabilities, but a considerable proportion also experience complex, combined conditions, with attention to the need for individualized interventions.



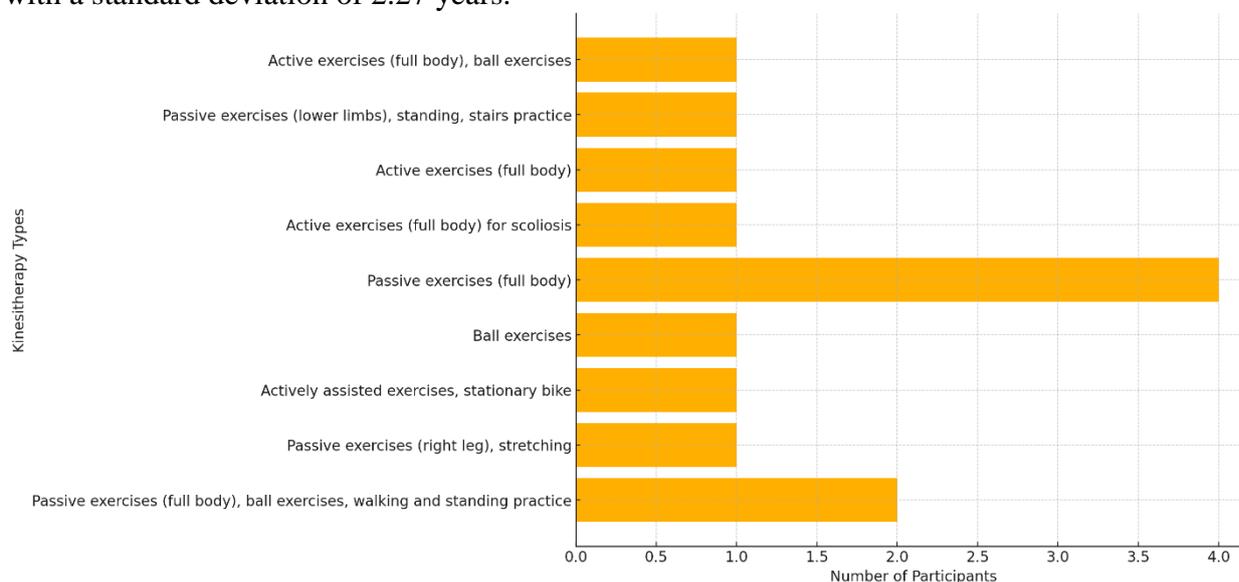
*Figure 4: Frequency of interventions across disabilities.*

Figure 4 shows the number of times each intervention is used across the disability of the participants. Kinesitherapy and massage are the most frequently used interventions, reflecting their central role in rehabilitation. Other interventions include music therapy, art therapy, speech therapy, and occupational therapy, each customized to the individual needs of the participants. Parafango therapy is used less frequently, indicating its selective application for specific conditions.



*Figure 5: Frequency of rehabilitation start ages.*

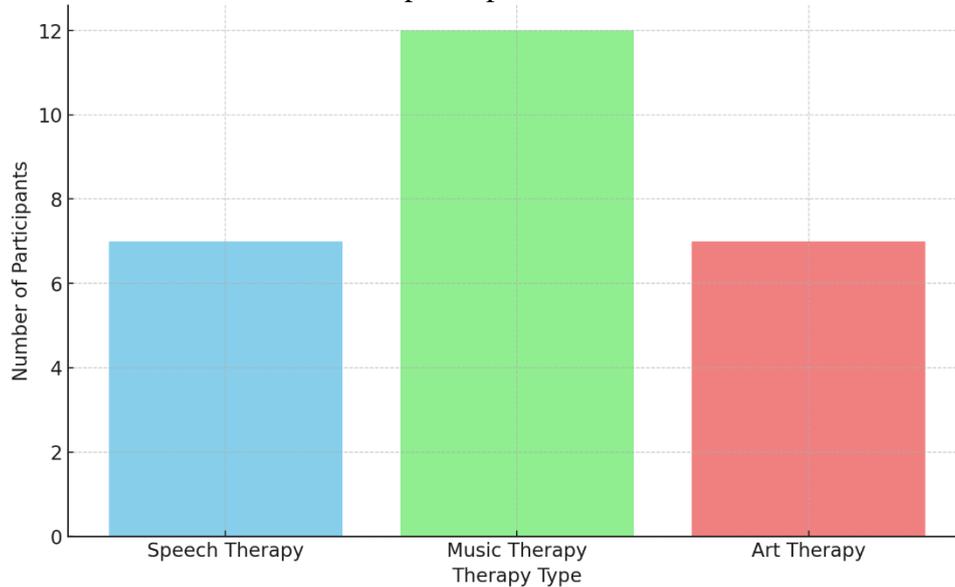
Figure 5 presents the distribution of participants based on when their rehabilitation began. The majority, 76.9%, started rehabilitation immediately upon the discovery of their condition. Specific ages, such as 1.5 years, 5 years, and 7 years, account for the remaining 23.1% of participants. The average start age for those with specific ages recorded is 4.5 years, with a standard deviation of 2.27 years.



*Figure 6: Types of kinesiotherapy conducted.*

Figure 6 shows the distribution of different types of kinesiotherapy among the participants. Mean number of participants per kinesiotherapy type is 1.44. Passive exercises on full body, ball exercises, walking and standing practice: 15.4%; Passive exercises on right leg, stretching: 7.7%; Actively assisted exercises, stationary bike: 7.7%; Ball exercises: 7.7%; Passive exercises on full body: 30.8%; Active exercises on full body for scoliosis: 7.7%; Active exercises on full body: 7.7%; Passive exercises on lower limbs, standing, stairs practice: 7.7%. The results showed that passive full body exercises are the most commonly used, suggesting

their importance in various rehabilitation needs. The variety in kinesitherapy methods showed individual interventions to suit different participant conditions.



*Figure 7: Participation in speech therapy, music therapy and art therapy.*

Figure 7 shows a detailed overview of the involvement of the participants in three key therapeutic modalities (speech therapy, music therapy, and art therapy). The results showed that music therapy had the highest level of engagement, with 12 participants, representing 92.3% of the included participants. This defines that music-based interventions are widely adopted, potentially due to their adaptability and effects in improving emotional well-being and cognitive functioning. In contrast, speech therapy and art therapy were used by 7 participants each, comprising 53.8% of the sample. This engagement across these two modalities shows the recognition of their importance in communication skills and creativity among persons undergoing rehabilitation. Further statistical analysis showed that the mean participation rate for speech and art therapy is 0.54, indicating moderate variability in their application. Music therapy on the other hand, showed a mean participation rate of 0.92, reflecting more consistent use among the participants.

## DISCUSSION

This research paper focuses on the important role of rehabilitation for persons with disabilities, especially focusing on those diagnosed with cerebral palsy, paraplegia, psycho-physical impairments, autism and mental retardation. The research shows the importance of a multidisciplinary approach, integrating physical therapy, occupational therapy, speech therapy and psychological interventions to developing functional results and improving in quality of life.

The results show that early intervention, especially when rehabilitation begins shortly after diagnosis is important for improving motor function recovery and minimizing the progression of disabilities. Most participants in this research began their rehabilitation early, defining the importance of timely therapeutic intervention in improving results. The data also focus on passive full-body exercises, music therapy and kinesitherapy are commonly used interventions, showing their proven effects in the treatment of persons with disabilities.

### *Similar Research*

One research by Overchuk et al. (2021) focus on the importance of vocational rehabilitation in improving the quality of life for persons with disabilities in Ukraine, accenting state and non-state support systems for vocational training. The study identifies important gaps in financing, logistical support and the adaptation of educational institutions for persons with disabilities, with imperfection in the professional selection process led by medical and social expert commissions. Comparing these findings with our research, both studies accent the importance of early intervention and individualized rehabilitation. However, while Overchuk et al. focus primarily on vocational training, our research draws attention to holistic rehabilitation approach, integrating therapies like kinesitherapy, music, and art therapy, individualized to both physical and cognitive impairments.

The research by Kosik (2010) focuses on individual adaptation to physical disabilities, accenting the role of coping mechanisms and personal control in optimizing health and well-being. This research paper shows the importance of a multidisciplinary approach, where case managers collaborate across various healthcare environments to support personal adaptation processes. Adaptation is framed as a long-term, personalized process influenced by socioeconomic, psychological and emotional factors, with unpredictable results depending on personal perceptions of well-being. Comparing this to our research, both studies accent the need for individualized rehabilitation approaches and multidisciplinary collaboration.

One research conducted by Saleh et al. (2024) at the Health, Rehabilitation, Integration, and Research Center (HRIR) in Lebanon focus on the success of using an ICF-based multidisciplinary approach to rehabilitate persons with disabilities. The center's approach focuses on evidence-based, coordinated outpatient programs that guide patients from the acute phase through to community reintegration. Despite challenges related to accessibility, affordability and availability in Lebanon, the HRIR center achieves rehabilitation results due to its comprehensive practices, qualified staff and modern equipment. When compared to our research, both studies accent the importance of a multidisciplinary approach. However, while HRIR focuses on overcoming structural barriers in Lebanon, our research prioritizes personalized therapeutic interventions like kinesitherapy and music therapy, beside the critical involvement of caregivers.

## **CONCLUSION**

This research focus on the critical role of a multidisciplinary approach in the rehabilitation of persons with disabilities, especially those with conditions such as cerebral palsy, paraplegia, autism and mental retardation. The study shows that early intervention, especially when initiated shortly after diagnosis plays important role in optimizing motor function recovery and reducing the progression of disabilities. The results accent the effects of commonly used rehabilitation techniques (passive full-body exercises, kinesitherapy and music therapy) in relieving both physical and cognitive impairments.

A key result from the research paper is the role of caregivers in the rehabilitation process. Their involvement not only provides important physical assistance but also offers important emotional support, promoting greater loyalty to therapeutic modalities. The research further accents the importance of individualized rehabilitation interventions to the unique needs of the persons with disability, making sure that both physical and emotional dimensions of rehabilitation are given.

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