

The effect of muscle spasticity and gross motor functionality on quality of life of spastic cerebral palsy children

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ABSTRACT

Background: Children with cerebral palsy (CP) frequently have this handicap. One prevalent kind of CP is spastic CP. Children with spastic cerebral palsy (CP) often have elevated muscle tone, paresis, spasticity, muscle weakness, and impaired motor control, which can impair everyday activities and gross motor functioning. Children with spastic CP may have a lower quality of life as a result of these issues. This research attempts to ascertain how children with spastic cerebral palsy (CP) perceive their quality of life in relation to muscular spasticity and gross motor performance.

Methods: This study used a literature review with secondary data from research journal reviews in Indonesian and English. The search for research journals was accessed through Google Scholar and Pubmed databases with a minimum of Scopus or Scopus indexing. Journals were selected based on inclusion and exclusion criteria. The keywords used for this research journal search were “spastic cerebral palsy children”, “gross motor functional”, “spasticity”, “QoL”, and “quality of life”.

Results: Quality of life in children with spastic CP depends on the type of spastic CP and the severity of spasticity. Children with high levels of spasticity and severe gross motor function impairment tend to have poorer quality of life compared to spastic CP with mild gross motor function impairment and low levels of spasticity.

Conclusion: The level of spasticity and poor gross motor function probably affect the quality of life in spastic CP children.

Keywords: children, functional gross motor, quality of life, spastic cerebral palsy, spasticity.

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Introduction

A frequent juvenile disability known as cerebral palsy (CP) is caused by damage to the brain during pregnancy, preterm birth, or birth asphyxia. This damage affects motor function.¹ The neurological and musculoskeletal systems of the body are impacted by damage to the developing brain before, during, or after childbirth. This can result in symptoms like abnormal muscle contractions, posture changes, movement limitations, activities accompanied by sensory disturbances along with perceptual disturbances, and so forth.¹ Common comorbidities and functional limitations of people with CP include chronic pain, epilepsy, intellectual impairment, musculoskeletal disorders such as hip displacement, behavioural disorders, sleep disorders, visual ability, and hearing impairment.² CP is usually diagnosed at 12 to 24 months when there are clinical findings in movement, posture, or balance disorders, and it is evident that the disorders are permanent or non-progressive.^{2,3}

Approximately 2 per 1000 birth incidents.⁴ CP is a leading cause of impairment in children. It is estimated that as many as 17 million people live with CP worldwide.⁵ Based on research data collected in Europe in 2020, Sadowska et al. (2020) reported that the average frequency of CP prevalence was 2.08 incidents per 1000 births; however, the prevalence was 70 times higher in the group of children weighing less than 1.500g than in the group weighing more than 2.500g.⁶ The National Health Interview Survey (NHIS) and the National Survey of Children's Health (NSCH) performed research in 2012–2013, and the results showed that the incidence rate of CP was 2.9 per 1.000 births and 2.6 per NSCH, respectively. The NSCH reports that the incidence of cerebral palsy in males is low, however the NHIS reports that the incidence of cerebral palsy in males is typically high.⁷ According to the study of Andromeda et al. (2023), it is reported that the number of CP cases per 1000 people in Asia is lower than in western countries.⁴ According to the study of Salfi et al.

(2019), the prevalence of CP in Indonesia is predicted to be 1 to 5 every 1.000 infant births.⁸

There exist four primary forms of cerebral palsy (CP) as identified by the Centers for Disease Control and Prevention (CDC) in 2024: spastic CP, dyskinetic CP, ataxic CP, and mixed CP.⁹ Each type of CP has its own unique characteristics. For example, dyskinetic CP is characterized by uncontrolled movements where muscle tone can occasionally increase or decrease, making it difficult for children to chew, speak, or swallow. Ataxia CP is characterized by poor coordination and balance, making it difficult for children to make fast movements or movements that require a lot of control, like writing. Finally, mixed CP is characterized by more than one characteristic of the three types of CP.⁹ The most prevalent of the four forms of CP is spastic CP.^{5,10} Increased muscular tone in children with spastic cerebral palsy causes their muscles to stiffen and cause aberrant motions.⁹ It is well recognized that upper motor neuron (UMN) lesions, like CP, can cause spasticity.¹¹ Spastic CP is classified into three forms based on the affected body area: spastic quadriplegia (all body parts and extremities), spastic hemiplegia (one side of the body), and spastic diplegia (lower extremities).⁹

One of the most frequent motor problems in people with cerebral palsy is spasticity. Increased muscle tone, paresis, involuntary motor control, and trouble maintaining balance in an upright posture which calls for a tiny base of support and a high center of mass are among the eleven characteristics of children with spastic cerebral palsy.¹² Secondary musculoskeletal issues and impaired feeling, cognition, communication, perception, and behavior (epilepsy) are common side effects of cerebral palsy (CP) that frequently coexist with motor impairment.¹³ The youngster will become dependent on caregivers or parental assistance if the degree of motor impairment is mild to severe.⁶ Children with spastic cerebral palsy (CP) suffer from disorders that affect not only their functional abilities but also their families' quality of life (QOL).¹⁴ This is consistent with studies conducted by Surender et al. (2016) and Ramadhani et al. (2021), which found that gross motor function in children with cerebral palsy (CP) is linked to every aspect of quality of life, including participation, physical function, physical health, and social well-being.^{15,16}

The high prevalence and low quality of life in spastic CP children will limit their activities in daily life.^{15,17} The main characteristic of spastic CP is an increase in muscle tone which will affect the level of spasticity and gross motor function of the child.⁹ Spasticity as a common symptom of spastic CP and gross motor skills needed in children's independence are important things that need to be explored further. There is a need to understand how spasticity and gross motor ability will affect the child's quality of life and create an effective intervention programme for each CP child in the future. Through this literature, an attempt is made to provide evidence-based data to support future clinical practice. There is a need to explore the relationship of increased muscle spasticity and gross motor function to

quality of life in spastic CP children with the aim of providing a comprehensive understanding of the challenges faced in improving overall well-being and developing interventions that can reduce clinical symptoms and comorbidities experienced.¹⁷ Thus, further research is required to determine how muscular stiffness and gross motor function affect children with spastic cerebral palsy's quality of life.

Methods

This research method used literature review or literature review studies with secondary data in the form of research journal reviews in Indonesian and English. With a publishing range of the last ten years and at least indexed by Sinta or Scopus, research articles pertaining to the impact of spasticity and gross motor function on quality of life in children with spastic cerebral palsy were sought after using the Google Scholar and Pubmed databases. Journals containing research participants older than eighteen were not included. The keywords used for this research journal search were 'spastic cerebral palsy children', 'gross motor functional', 'spasticity', 'QoL', and 'quality of life'. From the results of the search for research journals, journals that are relevant to the topic of discussion in this literature review were selected.

Results

Based on the results of the literature search, there are four literatures related to the title of the research that has been written. The results of Table 1 are as follows:

Based on the findings of the study of Ali, et al. demonstrating the relationship between children's quality of life and postural stability and spasticity. There was no specific discussion of the research design. 45 youngsters with spastic cerebral palsy who were outpatients at Cairo University's Faculty of Physical Therapy (22 girls and 23 boys) served as the study subjects. Pastic Cerebral Palsy, 4-6 year old boy or girl, and spasticity level 1 and 1+ (modified ashworth scale) are the inclusion requirements. Permanent deformity or contracture of the lower, upper, or spine, respiratory conditions, epilepsy or treatment-resistant seizure disorder, history of orthopedic surgery resulting from pathology, and Botox within a year of the study's start are the exclusion criteria. The degree of spasticity and quality of life showed a significant positive correlation ($p < 0.05$). The degree of spasticity and gross motor function were found to be significantly correlated ($p < 0.05$), with an increase in spasticity being associated with an increase in GMFM. However, no significant relationship was found between spasticity and postural stability index ($p > 0.05$). There was no correlation ($p < 0.05$) between quality of life and postural stability index, but there was a substantial positive link ($p < 0.05$) between quality of life and gross motor function.

Vameghi et al.'s study focuses on the quality of life, participation, and walking capacity of kids with spastic diplegic cerebral palsy. Based on the analytical results, the study comprised 181 SDCP children with a mean age of 135.81 ± 25.97 months (109 boys and 27 girls). The suggested

association to the variables in the initial hypothesis was significant ($p < 0.05$), according to the Pearson coefficient between the variables. Walking ability was influenced by several characteristics, including spasticity, balance, and muscle strength. Walking ability would also have an intermediate effect on the subject's quality of life ($B = -0.183$) and involvement ($B = 0.819$).

The Pearson correlation of all the variables (spasticity, strength, HRQOL, and gross motor function) in another study by Park revealed a strong association ($p < 0.001$). Spasticity and gross motor function (-0.446), muscle strength and gross motor function ($.479$), gross motor function and HRQOL (-0.560), and muscle strength and HRQOL (-0.300) all had significant direct impacts ($p < 0.05$). When it came to gross motor function, muscle strength had a significant negative indirect influence (-0.269) and spasticity had a significant positive indirect effect ($.250$) on HRQOL ($p < 0.05$).

In another study that has been conducted by Sritipsukho et al. The overall relationship coefficients of GMFM-66 and PedsQL dimension scores were in the range of 0.03 to 0.58. Except for the rolling and lying domains, the total HRQOL score was strongly linked with four of the GMFM-66 score's domains ($r = 0.32 - 0.53$) and had a comparable degree of correlation with the entire GMFM score ($r = 0.48$, $p < 0.001$). The total physical health score was strongly connected with three domains of the GMFM-66 score ($r = 0.49 - 0.58$) and had a moderate to good association ($r = 0.52$, $p < 0.001$) with the total GMFM score. The psychological health score was substantially linked with two categories of the GMFM-66 score ($r = 0.33 - 0.36$) and had a similar degree of association with the total GMFM score ($r = 0.27$, $p = 0.076$).

From the results of research conducted by Purnamasari et al. Showing Gross motor function with level I-II was found in Spastic Monoplegia (13.3%) and gross motor function ability (level IV-V) was found in Spastic Quadriplegia (20%). Level III gross motor function ability was most common in Spastic Hemiplegia (16.7%). Based on the quality of life, Spastic Hemiplegia had the poorest percentage of Quality of Life (30%), while the poorest percentage of Quality of Life was found in Quadriplegia type CP (10%), and not found in Diplegia and Monoplegia type CP. Of all the subjects, the percentage of children who experienced level I-III gross motor function limitations was 14 people, 4 out of 14 subjects (28.6%) experienced good and very good quality of life levels, and 10 subjects (71.4%) had poor and very poor quality of life (level IV-V). A total of 16 subjects (100%) had level IV-V gross motor limitations with poor and very poor quality of life.

According to a study by Ramadhani et al., there were 66.4% of children with spastic CP, 19.1% with athetoid CP, and 14.5% with ataxia CP. Of the 63 children in the CP, 56.4% have an excellent quality of life, while 43.6% have a bad quality of life. Of the CP children, 79 (71.8%) have low gross motor ability, and 31 (28.2%) have adequate gross motor ability. Strong family support was reported by 59 (53.6%) and weak family support by 51 (46.4%) CP children. Among CP

children, 49 (44.5%) had strong social support, whereas 61 (55.5%) had weak social support.

Discussion

At 2.11 per 1,000 births, CP is a major cause of physical impairment in children.¹² As many as 75% of CP cases are caused by prenatal factors, but about 92% of cases have an association with perinatal factors. CP is commonly associated as a cause of disability during labour or pregnancy, but some studies have shown that CP can occur due to brain injury in the postnatal period.¹⁸ In the postnatal period, about 10-18% of CP cases can be caused by conditions such as hypoglycemia, infection, and jaundice. While prematurity is an important factor in the etiology of CP, there are also many cases of CP in term infants, which are based on genetic factors. Suddenly occurring genetic mutations in certain genes can lead to the development of CP without other obvious causes. Factors such as congenital abnormalities, placental abruption, umbilical cord prolapse, condition of the mother during labour can also lead to the onset of brain damage in the fetus. Congenital causes, including schizencephaly, neural tube closure, microcephaly, and chromosomal defects also contribute to the development of CP.¹⁹

One prevalent kind of CP is spastic CP.^{8,9} Gross motor function and daily activities are impacted by motor impairments such as spasticity, muscle weakness, reduced range of motion (ROM), and selective motor control ability.²⁰ The ability of children with cerebral palsy (CP) to accomplish social communication and a high quality of life is negatively impacted by functional decline brought on by less physical activity, socializing challenges, cognitive delays, sensory impairment, and emotional issues.¹² Spasticity is a neuromuscular condition that will lower a child with cerebral palsy's quality of life. Functional impairment linked to everyday tasks, like walking, dressing, eating, and so on, can be brought on by spasticity in children.¹²

This is consistent with the findings of Ali's research (2021), which found that in children with spastic CP, spasticity demonstrates a link between gross motor function and quality of life. The findings showed that in children with spastic CP, spasticity is the primary cause of gross motor functional delay, which negatively impacts these children's quality of life without compromising postural stability in mild cases of spasticity. The amount of spasticity and PedsQL had a substantial positive link, as did the level of spasticity and gross motor function. Additionally, a Pearson correlation revealed that improvements in PedsQL were consistently

Table 1. The results of literature search of relationship between foot muscle morphology and flat foot posture with functional stability and incidence of ankle sprain in athletes

| Authors | Titles | Methods | Results |
|------------------------|--|---|---|
| Ali (2021). | Does spasticity affect the postural stability and quality of life of children with cerebral palsy? This article was published in the Journal of Taibah University Medical Sciences. | <ul style="list-style-type: none"> ● Study design: The research design was not explicitly mentioned. ● Subjects: 45 children (22 girls, 23 boys) Spastic Cerebral Palsy outpatients ● Inclusion criteria: spastic Cerebral Palsy, 4-6 years old boy/girl, spasticity level 1 and 1+ (Modified Ashworth Scale). ● Exclusion criteria: permanent deformity or contracture of lower/upper extremities/spine, respiratory disorders, epilepsy/treatment resistant seizure disorder, history of orthopaedic surgery due to pathology & Botox 12 months prior to the study. ● Instruments: the Modified Ashworth Scale, GMFM-88, PedsQL™, and Biodex Balance System. | <ul style="list-style-type: none"> ● The degree of spasticity and quality of life showed a substantial positive connection ($p < 0.05$). ● The degree of spasticity and gross motor function were shown to be significantly correlated ($p < 0.05$), with an increase in spasticity being correlated with an increase in GMFM. ● Spasticity and the postural stability index did not correlate ($p > 0.05$). ● There was no correlation ($p < 0.05$) between quality of life and postural stability index, but there was a substantial positive link ($p < 0.05$) between quality of life and gross motor function. |
| Vameghi et al. (2023). | Walking Ability, Participation, and Quality of Life in Children with Spastic Diplegic Cerebral Palsy: A Path Analysis Study. This article was published in the Iranian Journal of Child Neurology. | <ul style="list-style-type: none"> ● Study design: cross-sectional study. ● Subjects: 181 children with Spastic Diplegic Cerebral Palsy (SDCP). ● Inclusion criteria: children aged six-12 years with a diagnosis of SDCP, and a history of at least six months after surgery/Botox injection. ● Exclusion criteria: hydrocephalus, blindness and deafness. ● Instruments: ashworth Scale, MMT, Timed Up Go Test, Boyd and Graham test, goniometer, digital scale and tape measure, GMFCS, the Life Habits Questionnaire (LIFE-H), and CP QOL-Child. | <ul style="list-style-type: none"> ● The Pearson coefficient between the variables showed that the proposed relationship to the initial hypothesis variables was significant ($p < 0.05$). |
| Park (2018). | Path analysis of strength, spasticity, gross motor function, and health-related quality of life in children with spastic cerebral palsy. This article was published in the journal Health and Quality of Life Outcomes. | <ul style="list-style-type: none"> ● Study design: cross-sectional study and prospective design. ● Subjects: 62 children (44 boys, 18 girls) with Spastic Cerebral Palsy (CP) ● Inclusion criteria: clinical diagnosis of spastic, age 6 - 15 years, and parental consent to participate. ● Exclusion criteria: spina bifida, skeletal muscle disorders such as muscular dystrophy and myopathy, and history of selective dorsal rhizotomy surgery. ● Instruments: MMT, Ashworth Scale, and GMFCS, as well as the Childhood Health Assessment Questionnaire (Korean version). | <ul style="list-style-type: none"> ● Pearson correlation of all variables (spasticity, strength, HRQOL, gross motor function) showed significant correlation ($p < 0.001$). ● There were significant direct effects ($p < 0.05$) between spasticity and gross motor function, muscle strength and gross motor function, gross motor function and HRQOL, & muscle strength and HRQOL. ● Spasticity had a significant positive indirect effect on HRQOL ($p < 0.05$) and muscle strength had a significant negative indirect effect on HRQOL ($p < 0.05$) associated with gross motor function. |

- Sritipsukho et al. (2014). Correlations Between Gross Motor Functions and Health-Related Quality of Life in Thai Children with Spastic Diplegia.
- This article was published in the Journal of the Medical Association of Thailand.
- Study design: the research design was not explicitly mentioned.
 - Subjects: 50 children with spastic diplegia.
 - Inclusion criteria: children with Spastic Diplegia aged 2-12 years, motor function level 1-3 based on GMFCS classification, understand and obey oral instructions.
 - Exclusion criteria: received orthopaedic treatment/Botulinum Toxin injection within the last 6 months, seizures, cardiopulmonary compromise, severe vision and hearing deficits.
 - Instruments: GMFM-66 and Pediatric Quality of Life Inventory 4.0 (PedsQL).
- Purnamasari et al. (2022). The Correlation of Gross Motor Skills and the Quality of Life in Children with Cerebral Palsy.
- This article was published in the Journal of Nursing and Physiotherapy (JKF).
- Study design: cross-sectional.
 - Subjects: 30 students with CP.
 - Inclusion criteria: child with CP aged 6-18 years old, has a parent/caregiver who has cared for the child since birth.
 - Exclusion criteria: suffering from other diseases, other than CP.
 - Instruments: PedsQLTM 3.0 and (GMFCS-E&R) questionnaires.
- Ramadhani et al. (2021). Biosocial factors of quality of life in children with cerebral palsy.
- This article was published in Health Journal Vol. 14.
- Study design: cross-sectional.
 - Subjects: 110 subjects at PNTC Karanganyar and YPAC Surakarta.
 - Inclusion criteria: children with cerebral palsy and aged 4-12 years.
 - Exclusion criteria: not explicitly mentioned.
 - Instruments: CP-QOL and GMFM.
- The total HRQOL score had a similar degree of association with the total GMFM score ($r=0.48$, $p<0.001$) and was significantly correlated with four domains of the GMFM-66 score ($r=0.32 - 0.53$),
 - The overall physical health score had a moderate to good relationship with the total GMFM score ($r=0.52$, $p<0.001$) and was significantly correlated with 3 domains of the GMFM-66 score ($r=0.49 - 0.58$).
 - The overall score of psychosocial health had a similar degree of relationship with the total GMFM score ($r=0.27$, $p=0.076$) and was significantly correlated with 2 domains of the GMFM-66 score ($r=0.33 - 0.36$).
 - Gross motor function with level I-II was found in Spastic Monoplegia (13.3%) and gross motor function ability (level IV-V) was found in Spastic Quadriplegia (20%).
 - Based on quality of life, Spastic Hemiplegia had the poorest percentage of Quality of Life (30%), while the poorest percentage of Quality of Life was found in Quadriplegia type CP (10%), and not found in Diplegia and Monoplegia type CP.
 - Children with spastic CP were 66.4%, athetoid CP 19.1%, and ataxia CP 14.5%. In 63 CP children have a good quality of life (56.4%) and 48 children have a poor quality of life (43.6%) children. Gross motor ability is good in 31 (28.2%) CP children and poor gross motor ability 79 (71.8%).
 - CP children had strong family support 59 (53.6%) and weak family support 51 (46.4%). CP children with strong social support 49 (44.5%) and weak social support 61 (55.5%).

associated with improvements in gross motor function. However, there was no association found between the postural stability index and spasticity or PedsQL.¹²

According to a study by Vameghi et al. (2023), walking ability and participation are two elements that might affect the quality of life of children with spastic diplegia CP. Additionally, muscle strength, balance, and spasticity are the key factors that trigger walking ability in these children. The third significant component that has a direct impact on a child's ability to walk when they have spastic diplegia CP is spasticity. It indirectly impacts BMI, walking balance, and muscle strength. Notably, in children with CP, spasticity is a major factor in motor impairment. The reduced capacity of children with cerebral palsy to stand and walk will be impacted by an increase in stiffness in any one part of their bodies. According to certain research, being unable to move selectively will impair one's capacity to walk and motor function. The quality of life of children with spastic cerebral palsy was found to be significantly improved (94%) when walking capacity and child participation were combined.¹⁴

Park's (2018) study indicates that children with spastic CP have a causal association between motor disability and quality of life. Functional ability is impacted in terms of gross motor function and the results of daily activities by motor impairments such as spasticity, weakness, limited range of motion, and selective motor control ability. The study's findings demonstrated a relationship between muscle strength and gross motor function and quality of life, as well as a direct relationship between spasticity and gross motor function. In contrast, both spasticity and strength had statistically significant indirect effects on quality of life. Muscle strength and spasticity explained 61.4% of the variation in gross motor function, while these three factors also explained 63% in quality of life.²⁰

There is evidence from another study showing in children with mild to moderately severe spastic diplegia CP, gross motor function is related to quality of life. Sritipsukho et al. (2014) found a statistically significant relationship between gross motor function, physical health, and quality of life. According to this study, children with spastic diplegia CP had a lower quality of life than children with other chronic illnesses. The physical parts of their quality of life were well predicted by gross motor function, particularly in higher functions like walking, running, and jumping. Still, the psychosocial aspects were less well predicted. The results showed that the sum of physical health scores associated with several gross motor function domains was more than that of psychosocial health scores. The relationship between GMFM-66 and PedsQL scores showed that it was significantly associated with 4 domains of GMFM-66, namely sitting, crawling, standing, walking, running, and jumping in physical health aspects.¹³

Research by Purnamasari et al. (2022) stated the distribution of mild to severe gross motor abilities based on the type of CP.¹⁴ Children with spastic monoplegia and spastic diplegia show that they have mild gross motor abilities at level one and level two. In contrast, children with spastic

hemiplegia and spastic quadriplegia show that they have severe gross motor limitations at levels four and five. Based on the level of quality of life, Spastic Hemiplegia has a poor QOL percentage with a percentage of 30%. In comparison, the worst QOL percentage is found in Quadriplegia type CP (10%), and Diplegia and Monoplegia type CP do not experience poor quality of life.¹⁵ The results of the distribution analysis of mild and severe gross motor skills showed that children with spastic hemiplegia and spastic quadriplegia had poor and very poor QOL. This shows that the type of CP in children will affect their gross motor ability and the quality of life of their children.¹⁶ Children with mild and moderate levels of gross motor function (levels one to three) have a lower risk of very poor QOL than children with severe gross motor function (levels four and five).¹⁷

A child's gross motor function ability is more limited in children with more severe cerebral palsy, which may have an impact on the child's quality of life.¹⁸ Children with spastic cerebral palsy (CP) may experience worsening sleep patterns, difficulties with everyday activities, pain, and other issues as a result of their spasticity, gross motor function capacity, persisting abnormal reflexes, and other disorders.¹⁹ The association between QOL and gross motor function ability was shown to be significantly correlated, according to a relationship analysis test conducted on thirty youngsters.²⁰

A study by Ramadhani et al. (2021) shows that gross motor function capacity in children with cerebral palsy is always connected to QOL in all quality-of-life domains. Compared to children with low gross motor ability, children with cerebral palsy will have a higher chance of leading a high-quality life.²¹ This is consistent with the study's findings, which showed that gross motor skills and quality of life had a statistically significant direct positive association. Factors such as pain, impaired sensory function, neuromuscular, musculoskeletal, mental, and physical limitations, and others related to motor ability will affect QOL in children. Parental support, emotional support, and information on care management are also needed to fulfill the need for adequate assistive devices or access to therapy to improve the function of daily activities and participation of children, which will affect QOL.²²

The study's reliance on secondary data from previously published research limits its findings to the quality and scope of existing literature, potentially missing recent developments not yet published. Additionally, the search is restricted to publications from the last 10 years, which ensures the inclusion of recent research but may overlook older studies that could provide valuable insights or foundational theories on spastic cerebral palsy. Moreover, by including only journals indexed by Sinta or Scopus, the study may exclude relevant research not indexed by these databases, potentially missing out on significant insights.

Conclusions

The type of spastic cerebral palsy and the degree of spasticity in children with it affect their quality of life.

Compared to spastic CP patients with modest gross motor function impairment and low spasticity, children with high levels of spasticity and severe disability typically have a lower quality of life. High levels of spasticity combined with poor gross motor function skills can impair a child's capacity to function in day-to-day activities, which lowers the quality of life for children with spastic cerebral palsy. Future studies are anticipated to address other variables influencing children with spastic cerebral palsy's quality of life; ideally, these investigations will aid in the development of more focus.

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Conflict of interest

According to the author, there isn't any possible conflict of interest related to this paper's study, writing, or distribution.

Author contributions

PPALD conceived the study design and data collection and drafted the manuscript; and NLPGKS collected and revised the data.

Ethical consideration

This review study used published articles that are accessible. Thus, this study did not require any informed consent or ethical consideration.

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