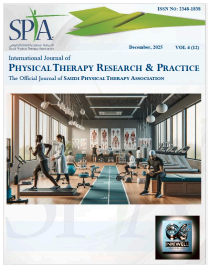

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Original Article

Rehabilitation Professionals' Perception of Differences in Development and Clinical Manifestations Between Right and Left Hemiplegia in Children

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Abstract

Background. Hemiplegic cerebral palsy presents with lateralized impairments that may influence developmental outcomes. While literature suggests lesion laterality affects domains such as language and spatial awareness, clinical consensus remains unclear. **Purpose.** To determine whether rehabilitation professionals observe differences in development or functional outcomes between right and left hemiplegia in children. **Method.** A cross-sectional survey of licensed pediatric rehabilitation professionals was conducted. Quantitative data were analyzed using descriptive statistics, Chi-square test and logistic regression. Qualitative responses were thematically analyzed. **Results.** 63.3% of total (n=49) pediatrics rehabilitation professionals report perceiving difference between hemiplegia types. Right hemiplegia was significantly associated with speech and language difficulties with a 61.3% of all participants. Motor deficits were the most commonly observed domain with 74.2% of participants. Cultural factors, such as religious emphasis on right-hand use, were noted to influence rehabilitation outcomes. **Conclusion.** The findings of this study, supported by previous literature, reinforce the hypothesis that developmental and functional differences are perceived between left and right hemiplegic cerebral palsy. Rehabilitation specialists should adopt a holistic approach that considers both lesion severity and cultural norms influencing perceptions of development and function. Integrating neurobiological and sociocultural factors is essential for individualized rehabilitation strategies.

Keywords: Hemiplegia, cerebral palsy, Lesion laterality, Pediatric rehabilitation, Saudi Arabia

Introduction

Cerebral palsy (CP) stands as one of the most common motor disabilities encountered in childhood, profoundly affecting movement capabilities, communication, and the overall

quality of life for affected children and their families (Novak et al., 2025). Within the diverse clinical presentations of CP, hemiplegic cerebral palsy, characterized by unilateral impairments, presents a unique and complex clinical challenge (Uvebrant, 1988). This specific form of CP results from a brain injury occurring pre-, peri-, or post-Nataly, leading to deficits predominantly on one side of the body (Hughes & Cross, 2003).

Compelling research indicates that the precise side of the brain injury significantly influences the developmental and clinical manifestations observed in children with hemiplegia (Piña-Garza & James, 2019). For instance, children diagnosed with right hemiplegia, which is typically linked with lesions in the left cerebral hemisphere, may experience more pronounced language deficits (Riès et al., 2016). Conversely, those with left hemiplegia often display distinct differences in spatial processing and nonverbal cognition (Sarwar & Emmady, 2023).

The understanding of these hemispheric influences on development has evolved over time. Early investigations, dating back to seminal work from the early 2000s, laid a crucial foundation by establishing differences in motor performance, language, and cognitive outcomes based on the affected hemisphere (Rosenbaum et al., 2007; Vargha-Khadem et al., 1992). More recent research has significantly enriched this understanding, providing further evidence on intervention outcomes and highlighting the intricate interplay between motor and cognitive skills (Morgan et al., 2016). This interrelationship is profound that, as emphasized in a 2024 editorial, motor and cognitive functions are deeply intertwined in the development of children with neurodevelopmental disorders, reinforcing the notion that these domains do not evolve in isolation (Li, 2024). This continuously evolving body of knowledge underscores the complexity of hemiplegic cerebral palsy and the varied developmental trajectories influenced by lesion laterality (Sakzewski et al., 2025).

Given these complex and often nuanced differences, and the existing gaps in comprehensive comparative data, this study aims to determine whether rehabilitation professionals in Saudi Arabia perceive developmental and functional differences between right and left hemiplegia in children, and to compare these perceptions with existing literature. We hypothesize that rehabilitation professionals in Saudi Arabia perceive significant and consistent differences in the developmental and clinical manifestations between children with right hemiplegia and those with left hemiplegia, particularly in the domains of language, spatial processing, and nonverbal cognition.

METHODOLOGY

Study Design and Setting

A cross-sectional, survey-based study was conducted. This design was chosen to gather both quantitative and qualitative data from rehabilitation professionals. The survey focused on their clinical observations regarding perceived differences in developmental outcomes between children with right and left hemiplegia.

Study Participants

Eligible participants included licensed physical therapists, occupational therapists, and speech-language pathologists with at least one year of experience and direct clinical exposure to children with hemiplegia. Professionals without pediatric experience and incomplete responses were excluded.

Survey Questionnaire

A custom-designed Google forms Likert-type questionnaire was utilized as the primary data collection instrument distributed via social media

(X, WhatsApp, Instagram, Telegram and LinkedIn). This survey is structured into three main sections to gather comprehensive insights from rehabilitation professionals:

Section A: Demographics collects information on the respondent's specialty, years of experience in pediatric rehabilitation, and city of practice.

Section B: Clinical Observations focuses on quantitative data, probing perceived differences between right and left hemiplegia. It includes questions about the estimated number of patients treated, and specific questions regarding observed differences in areas such as motor skills, language development, cognitive functions, visuospatial challenges, speech/language difficulties, functional abilities, and adaptation of treatment plans based on hemiplegia type. Standardized rating scales were used to assess these observed differences across various developmental domains.

Section C: Open-Ended Questions provides an opportunity for qualitative data collection, allowing clinicians to describe specific differences they have observed in children with right versus left hemiplegia in their personal clinical experiences.

Questionnaire Validation

Content Validity: Initial items was drafted based on a comprehensive literature review on hemiplegia, developmental differences, and clinical practice in rehabilitation. A panel of 3-5 expert rehabilitation professionals (physiotherapists, occupational therapists, and speech-language pathologists with extensive experience in pediatric neurology/rehabilitation) not involved in the study's data collection were invited to review the questionnaire. This panel assessed the clarity, relevance, comprehensiveness, and appropriateness of each question in addressing the study objectives. Their feedback was systematically collected and used to refine the questionnaire items, ensuring strong content validity.

Face Validity: Following content validation, the refined questionnaire was reviewed by a small group of 5-10 rehabilitation professionals' representative of the target audience. They provided feedback on the clarity of language, ease of understanding, flow, and overall user-friendliness of the questionnaire. Their input informed final revisions before the pilot study.

Pilot Study: A pilot study was conducted with a small sample of approximately 20-30 rehabilitation professionals (who were not participating in the main study). The primary aims of the pilot study were to: 1- Assess the questionnaire's clarity, comprehensibility, and completion time. 2- Identify any ambiguous questions or technical issues with the online platform. 3- Gather preliminary data to assess the internal consistency (reliability) of Section B's Likert-scale items.

Reliability (Internal Consistency): Data collected from the pilot study for Section B (Clinical Observations with Likert scales) was analyzed for internal consistency using Cronbach's Alpha. A Cronbach's Alpha coefficient of 0.70 was considered acceptable, indicating good internal consistency among the items designed to measure similar constructs. Items demonstrating low correlation with the overall scale were reviewed and revised or removed as necessary to improve reliability.

Bias Considerations

Because the study questioner was shared via social media it is subject to potential bias including selection bias as therapist who were chosen are mostly known to study authors and those more active in social media, also selection bias as it was overly representing western region participants and less from other regions in Saudi Arabia, finally coverage bias as it may excluded those inactive in

social media or were not reachable by authors, these limitations should be considered when interpreting the findings.

Sample Size Estimation

The target sample size for this survey is determined to ensure adequate representation and the ability to capture diverse clinical insights from rehabilitation professionals. Based on a sample size calculation aiming for a 95% confidence level with a 5% margin of error and assuming a population proportion of 50% (for maximum variability), a minimum of 385 participants will be sought. However, the actual number of respondents obtained through social media distribution was 49, which is below the estimated requirement and should be considered when interpreting the generalizability of the findings

Statistical Analysis

Quantitative data were analyzed using SPSS v28. Descriptive statistics summarized participant characteristics. Associations between rehabilitation professionals' perceptions and professional characteristics were examined using Chi-square tests square tests, with statistical significance set at $p < 0.005$. Binary logistic regression was conducted with perception of differences (yes/no) as the dependent variable and profession, years of experience, and region as predictors. The odds ratios for both profession and experience include 1.0 in their confidence intervals and Nagelkerke R^2 of 0.05, confirming a lack of statistical significance. Qualitative responses were analyzed inductively through thematic analysis; two independent coders identified and refined themes, with discrepancies resolved through discussion to ensure reliability. This integrated approach ensures a holistic interpretation of the data, bridging the gap between empirical observation and clinical expertise in Saudi context

Ethical Consideration

Institutional Review Board (IRB number: NRJ25/005/7) approval was obtained from King Abdullah International Medical Research Center (KAIMRC) on the 19th of August 2025. Informed consent was secured from all participants voluntarily and anonymously, and data confidentiality was strictly maintained.

Results

The findings of this study present a comprehensive mixed-methods analysis of survey data collected from 49 pediatric rehabilitation professionals across Saudi Arabia. The primary aim was to systematically investigate their perceptions of differences in developmental and functional profiles between children with right and left hemiplegia. The analysis was structured to address the study's specific objectives: 1) to determine the prevalence of perceived differences, 2) to identify the most affected domains and the direction of these differences, 3) to contrast these clinical insights with established neuroanatomical models, and 4) to explore the translation of these perceptions into clinical practice.

Demographic Data

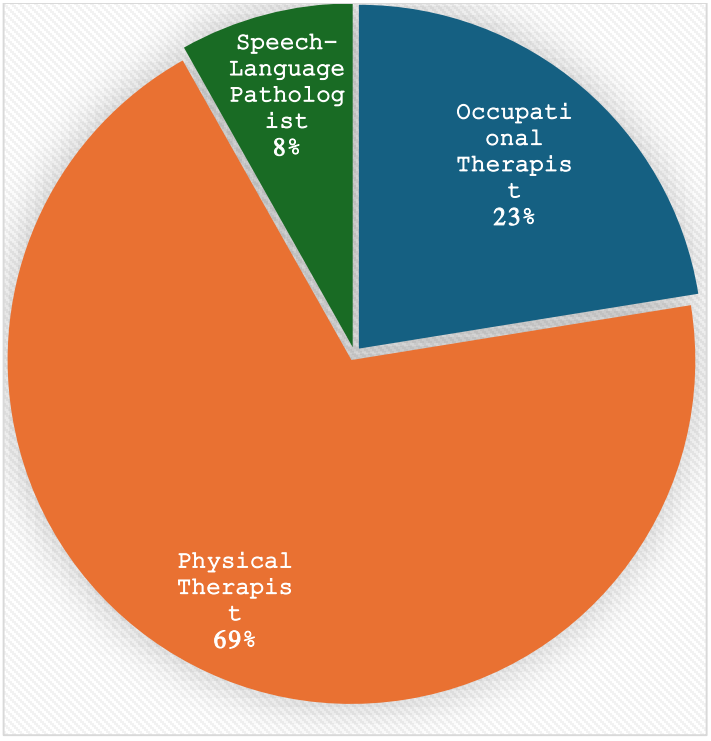
The final sample consisted of 49 respondents, including physiotherapists, occupational therapists, and speech and language pathologists. providing a snapshot of practicing rehabilitation professionals in Saudi Arabia. As detailed in Table 1, the cohort was predominantly composed of Physical Therapists, reflecting their central role in motor rehabilitation for hemiplegia, most of respondents were based in the Western region of Saudi Arabia.

Clinical experience was diverse: the largest single group had 1-3 years of experience, while a robust cohort of highly experienced clinicians (>10 years)

constituted low percentage of the sample. Importantly, over one-third of respondents reported extensive clinical exposure, having treated more than 30 children with hemiplegia, thereby lending considerable weight to their perceptions based on substantial practice.

Table 1: Demographic and Professional Characteristics of Respondents (N=49).

Character	Category	n	%
Profession	Physical Therapist (PT)	34	69.39
	Occupational Therapist (OT)	11	22.45
	Speech-Language Pathologist (SLP)	4	8.16
Years of Experience	< 1 year	7	14.28
	1-3 years	22	44.9
	4-7 years	12	24.49
	8-10 years	3	6.12
	>10 years	5	10.20
Degree of education	Bachelor's	40	81.6
	Master's	8	16.3
	Post-professional DPT	1	2.1
Region of Practice	Western	40	81.63
	Central	3	6.12
	Eastern	4	8.16
	Southern	1	2.04
	Northern	1	2.04



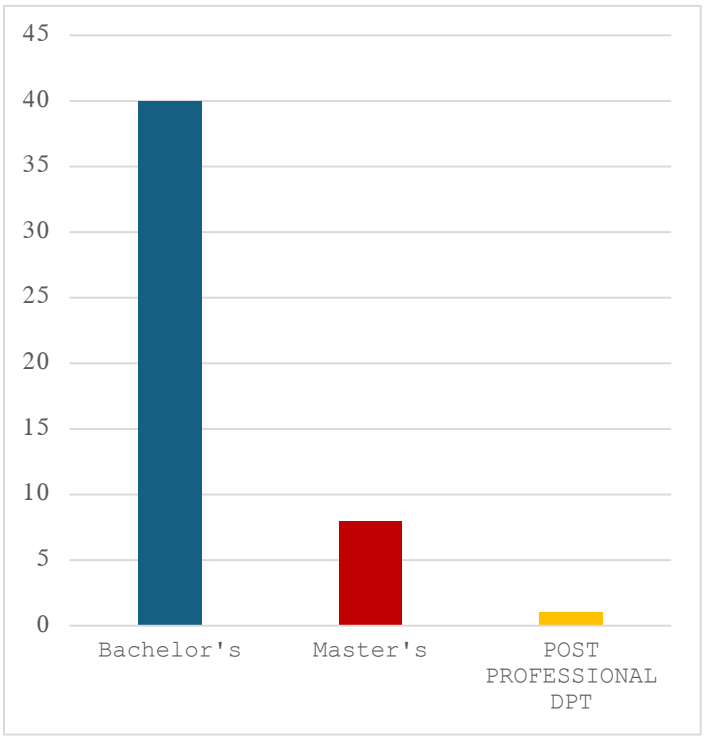


Figure 1: Distribution of Professions

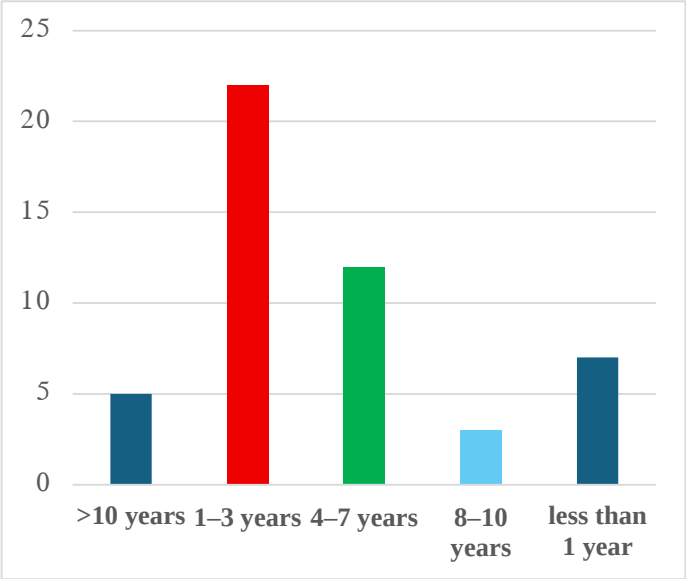


Figure 3. Years of experience distribution

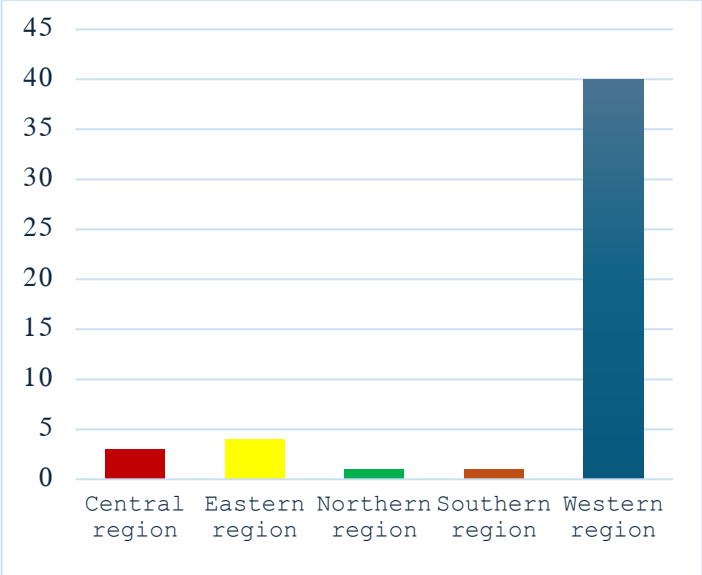


Figure 4. Regional distribution

Clinical observations

In order to address the primary objective, determining whether therapists perceive a global difference. A definitive majority of respondents reported observing discernible differences between right and left hemiplegia. However, a substantial proportion expressed uncertainty ("Not sure"), suggesting that these differences are not universally salient or consistent across all

Figure 2. Degree of Education

clinical presentations. A small minority reported observing no difference at all.

Table 2: Clinical observation, about the number of patients treated and the noticed difference.

Characteristic	Category	n	%
Estimated Patients Treated	1-5	16	32.7
	6-15	11	22.44
	16-30	10	20.41
	>30	12	24.5
Noticed Difference	Yes	31	63.27
	No	6	12.24
	Not sure	12	24.49

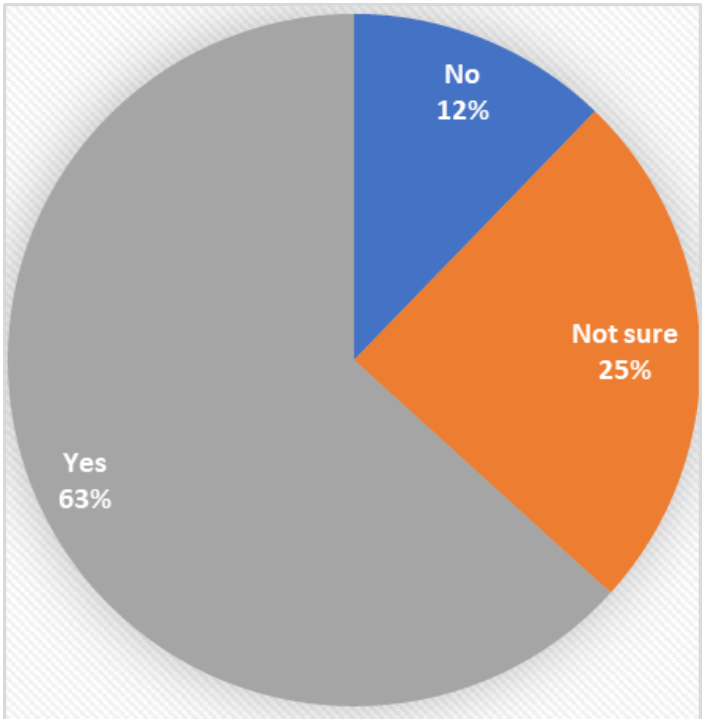


Figure 5: Noticed difference Distribution

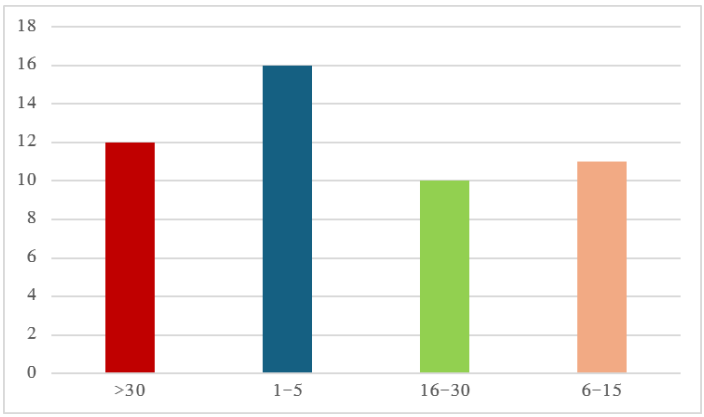


Figure 6: Estimated Patients Treated Distribution

Domains of Perceived Difference

A comprehensive analysis of the domains most affected by hemiplegia laterality, derived from a multiple-response survey question posed to the 31 therapists who reported perceiving a difference, revealed distinct patterns in professional observation. Motor deficits constituted the most frequently cited area of divergence, identified by nearly three-quarters of respondents, underscoring that unilateral motor impairment is the most salient and consistently noted feature differentiating the two groups. Language development emerged as the second most prevalent domain, with less than two thirds of clinicians surveyed observe apparent differences, reinforcing the strong clinical link between left-hemisphere damage (right hemiplegia) and communication challenges. Furthermore, more than half of the observant clinicians reported discernible differences in cognitive function, indicating that the impact of laterality extends beyond pure motor and language deficits into higher-order processing. Other domains, including sensory regulation and visual-perceptual skills and social behavior, were also noted by a substantial minority, painting a picture of hemiplegia as a complex neuromotor condition whose manifestations are perceived by therapists to permeate a wide spectrum of developmental and functional areas. Respondents were able to select all applicable domains from a provided list, therefore the percentages sum to more than 100%.

Table 3: Domains Where Differences Are Perceived (Among those who said "Yes", n=31).

Domain	Count (n=31)	Percentage (%)
Motor skills	23	74.2%
Language development	19	61.3%
Cognitive function	17	54.8%
Sensory Regulation	13	41.9%
Visual-perceptual skills	13	41.9%
Social behavior	10	32.3%

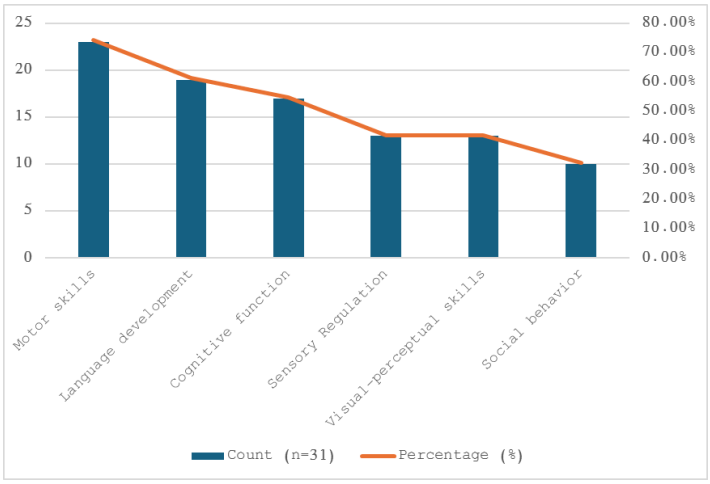


Figure 7: Domain perceived difference

Inferential Analysis Using Chi-Square Tests

This analysis aimed to understand the perceptions of rehabilitation professionals in Saudi Arabia regarding differences between children with right and left hemiplegia. We first confirmed that a majority of therapists have observed a difference between the two conditions. For those who saw a difference, we identified the areas where they were most noticeable: Motor skills and Language development were the most frequently reported domains.

We then used (Chi-Square) to see if there was a clear consensus on which side of hemiplegia is associated with specific challenges. The results show a strong and statistically significant agreement with established medical knowledge: clinicians overwhelmingly associate right hemiplegia (damage to the left side of the brain) with greater speech and language difficulties. They also strongly associate left hemiplegia (damage to the right side of the brain) with greater visuospatial and cognitive challenges.

However, for other outcomes like motor skill improvement, functional abilities, or therapy results, there was no significant consensus. Finally, we found that practice varies, with many clinicians less than half only sometimes adapting their treatment plans based on whether the child has right or left hemiplegia.

Table 4: Statistical Analysis of Clinical Perceptions by Hemiplegia Type

Clinical Question	Most Frequent Response	n	p-value (Chi-Sq)
Associated with speech/language difficulties?	Right Hemiplegia	19	< 0.001*
Shows greater visuospatial /cognitive challenges?	Left Hemiplegia	16	0.003*
Shows complicated motor skill development?	Right Hemiplegia	15	0.13
Shows faster improvement in motor skills?	Right Hemiplegia	12	0.62
Gained higher functional abilities?	Right Hemiplegia	15	0.13
Recorded higher outcome measure scores?	Right Hemiplegia	14	0.18
Showed greater outcomes in a shorter period?	Right Hemiplegia	13	0.42

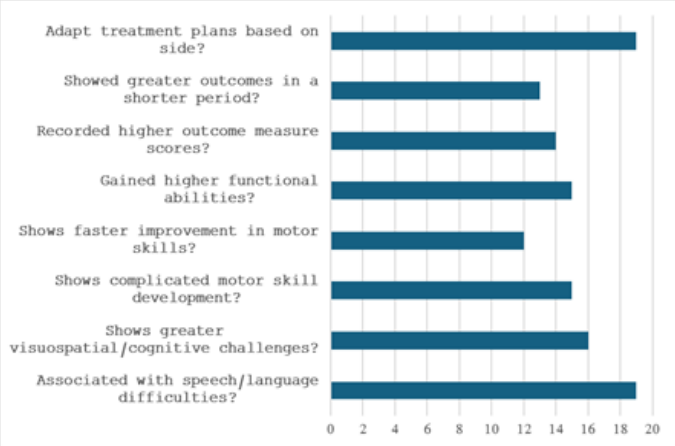


Figure 8: Clinical domains

Logistic Regression Analysis

To identify factors associated with a clinician's likelihood of perceiving a difference between right and left hemiplegia, a binary logistic regression was performed. The dependent variable was Perceived Difference, coded as 1 for "Yes" and 0 for "No" or "Not sure". The independent variables were Profession (dummy-coded with Speech-Language Pathologist as the reference category) and Years of Experience (treated as a continuous variable using mid-points of each range: <1 yr=0.5, 1-3 yrs=2, 4-7 yrs=5.5, 8-10 yrs=9, >10 yrs=12).

The full model containing all predictors was not statistically significant, χ^2 (3) = 1.85, p = 0.60, indicating that the model was not able to distinguish between respondents who perceived a difference and those who did not. Neither profession nor years of experience were significant predictors of perceiving a difference.

Table 5: Logistic Regression Predicting the Likelihood of Perceiving a Difference (N=49)

Predictors	Adjusted Odds Ratio (AOR)	95% CI for AOR	p-value
Profession (Ref: SLP)			
Physical Therapist	1.25	[0.23, 6.71]	0.79
Occupational Therapist	1.67	[0.26, 10.66]	0.59
Years of Experience	1.04	[0.91, 1.18]	0.55

CI = Confidence Interval. Model Nagelkerke R^2 = .05.

Qualitative Integration

Thematic Analysis of Qualitative Responses:

A thematic analysis of the open-ended responses provided rich, contextual insights into therapists' perceptions, complementing the quantitative data. Four central themes emerged from the narrative data:

Theme 1: Alignment with Neuroanatomical Models

The most prominent theme was the explicit link therapists made between the side of hemiplegia and expected functional deficits based on neuroanatomy. Multiple respondents directly stated that right hemiplegia (left hemisphere lesion) is associated with "language and communication difficulties," while left hemiplegia (right hemisphere lesion) is associated with "visual-spatial and attention problems" and challenges with "coordination and body perception." This theme strongly reinforces the significant quantitative consensus found in the statistical analysis.

Theme 2: The Primacy of Overall Injury Severity

A countervailing theme questioned the primary focus on laterality. Several therapists expressed the view that the extent or severity of the brain injury is a more critical determinant of a child's outcomes than the side of the injury. One respondent noted, "Other aspects I believe more depend on the severity and how much the brain has been affected rather than which side." This perspective provides an important nuance, suggesting that while laterality is recognized, it is not always seen as the predominant factor.

Theme 3: The Influence of Cultural and Religious Context

A unique and context-specific theme highlighted the impact of Saudi Arabia's cultural and religious environment on rehabilitation. therapists observed that societal emphasis on using the right hand for important tasks (e.g., eating, greeting) provides practical motivation for children with right hemiplegia and their families to focus on rehabilitating the affected limb. One therapist wrote, "Patient with right hemiplegia is likely to be better in functional and motor movement... because of family and religion, which motivates them to use their right first." This suggests that cultural factors may indirectly influence functional outcomes and therapy focus.

Theme 4: Subjective Observations of Motor Quality and Tone

Some therapists offered nuanced observations on differences in motor quality between the two groups, which were not captured by the quantitative questions. For example, one respondent stated, "I observed that right hemi is more spastic than left hemi," indicating a

perception of differences in tone or movement quality that merits further investigation.

Discussion

This study was aimed at determining whether rehabilitation professionals observe differences in development or functional outcomes between right and left hemiplegia in children we found from the study that majority of the participants (63.3%) perceived developmental and functional differences between assessed, motor skills were the most frequently identified area of difference (74.2%), followed by language development (61.3%), and cognitive function (54.8%). The other domains including sensory regulation, visual-perceptual skills, and social behavior, were also reported by a notable group of therapists.

The directional difference, right hemiplegia is associated with left hemisphere lesions was significantly linked to speech and linguistic difficulties $p<0.001$, however left hemiplegia comes from right hemisphere lesions was significantly accompanied by visuospatial and cognitive challenges $p=0.003$. On the other hand, no significant consensus was observed regarding differences in motor recovery, functional abilities, or therapy outcomes. Logistic regression analysis showed that neither profession nor years of experience were significant predictors of whether therapists perceived these differences.

Qualitative findings provided a further contextual understanding with four major themes: 1. Alignment with neuroanatomical models. 2. Primacy of injury severity. 3. Cultural and religious influence. 4. Differences in tone and motor quality.

The results showed that Saudi rehabilitation professionals perceive meaningful developmental distinctions between children with right and left hemiplegia. The consistent association of the right hemiplegia with language and speech difficulties, and of left hemiplegia with visuospatial and cognitive challenges, aligns well with established neurological understanding of hemispheric specialization (Novak et al., 2025; Sakzewski et al., 2025; Uvebrant, 1988). These findings suggest that the side of the brain that is injured plays a role in the variations of how the children develop communication, cognitive, and motor abilities, providing a neurological basis for side-specific rehabilitation needs (Novak et al., 2025; Vargha-Khadem et al., 1992).

The absence of significant differences in motor recovery or functional outcomes suggests that lesion laterally alone does not fully determine the developmental progress (Morgan et al., 2016; Sakzewski et al., 2025). Participants reports and the non-significant logistic regression results point to other influential factors particularly the severity of the brain lesion, Individual neuroplastic responses, and environmental enrichment. This perspective reinforces the modern view that child development results from the dynamic interaction of biological, experiential, and contextual elements rather than being dictated solely by lesion location despite seemingly emerging perceived pattern of left and right hemiplegia lesion laterality.

The qualitative data also highlight a unique cultural dimension that shapes rehabilitation in the Saudi context. The social and religious importance placed on right hand use appears to affect both family engagement and the therapeutic priorities, potentially promoting greater motivation and functional recovery for children with right hemiplegia. This finding reveals how cultural values can indirectly influence neurodevelopment outcomes, emphasizing the need to consider sociocultural

context in pediatric rehabilitation planning. (Riès et al., 2016).

This study emphasizes that hemispheric laterality is a key factor in the developmental and clinical outcomes in children with hemiplegic cerebral palsy. Participating rehabilitation professionals reported that right hemiplegia (left hemisphere lesions) is often linked to speech and language difficulties, while those with left hemiplegia (right hemisphere lesions) demonstrate visuospatial and cognitive deficits. These findings strongly align with prior studies that described similar patterns in language and spatial functions (Hughes & Cross, 2003; Uvebrant, 1988; Vargha-Khadem et al., 1992). More recent studies also reinforced the dominance of the left hemisphere in language and the right hemisphere in visuospatial awareness (Riès et al., 2016; Piña-Garza & James, 2019). These findings show that distinctions are not only evident in controlled research environments but are also recognizable in day-to-day clinical practice.

However, from a motor perspective, the current results revealed no significant perceived difference in gross motor improvement or overall functional ability between right and left hemiplegia, consistent with Morgan et al. (2016) and Sakzewski et al. (2025) who found limited evidence of laterality-related differences in motor intervention outcomes. Instead, therapists emphasized that severity of injury and early intervention were more determining factors than lesion laterality alone (Morgan et al., 2016; Sakzewski et al., 2025).

The absence of significant associations in these domains suggests that motor recovery may be influenced more by non-lateralized factors such as therapy intensity, early intervention, family engagement, and socioeconomic context. These factors support recent findings emphasizing that functional outcomes in hemiplegic cerebral palsy are multifactorial, reflecting an interplay between neurological, therapeutic, and environmental variables (Novak et al., 2025).

Moreover, this study introduces a novel sociocultural perspective, which has been largely absent from prior studies (Hughes & Cross, 2003; Vargha-Khadem et al., 1992). Therapists highlighted that cultural and religious emphasis on right-hand use in Saudi Arabia motivated families of children with right hemiplegia to prioritize rehabilitation of the affected limb. This finding adds a crucial sociocultural layer to existing biomedical models, connecting clinical practice with cultural values. While the clinical patterns observed in this study align with international research on hemispheric specialization, the additional cultural perspective highlights the importance of localized context in shaping rehabilitation priorities and outcomes (Riès et al., 2016). Therefore, this study shifts the understanding of hemiplegic cerebral palsy from a purely lesion-based approach to one that considers a wider range of biological and sociocultural influences on development.

Study limitations and future recommendations

The study encountered several limitations during the data collection process, which may have impacted on the validity and reliability of the results. Firstly, the sample size was modest due to non-compliance of the pediatric therapists to participate in the survey. Moreover, participants were predominantly concentrated in the Western region of Saudi Arabia, which may potentially limit the generalizability of findings.

Furthermore, perceptions may not always align perfectly with objective neuropsychological or imaging data, as they are inherently subjective. Nevertheless, the integration of quantitative and qualitative findings offers a robust and contextually grounded perspective that bridges

theoretical neuroscience with practical rehabilitation experience.

Findings taken holistically show that while hemispheric specialization provides a useful framework for understanding developmental differences in hemiplegic cerebral palsy, successful rehabilitation requires a broader, and more individualized approach. Integrating neurological knowledge with sensitivity to cultural practices and environmental support may enhance treatment outcomes.

Based on the identified limitations of the current study, several recommendations are proposed to enhance the reliability and validity of future findings: expand the sample size by incorporating participants from additional regions across Saudi Arabia. This geographic diversification will ensure a broader and more representative pool of survey respondents, thereby improving generalizability.

Additionally, implement a standardized assessment tool specifically designed for hemiplegic patients. Such an instrument should comprehensively evaluate the domains addressed in this research, allowing for more objective and consistent scoring across subjects.

Moreover, encourage longitudinal and interdisciplinary studies that examine the complex interplay between biological and social determinants. Continued investigation into how these factors jointly influence developmental trajectories in children with unilateral cerebral palsy will contribute to a more holistic understanding and inform targeted interventions.

However, this study focused on only licensed pediatric rehabilitation professionals with more than one year of experience which gives the results strength and support to the hypothesis. In addition, the survey covered multiple developmental aspects that is not regularly highlighted in this type of research such as language delay, cognitive deficit, sensory impairment, and behavioral issues.

Furthermore, the study included reliable and valid survey that facilitates replication by other specialists in several regions. This makes the research applicable for expansion and implementation with larger sample size in different regions.

Additionally, the randomization of the sample (hemiplegic CP patients) included in the research are from different cultural background, social situation, level of severity, and availability of therapy did not affect the significance of results, conversely, the data supported the hypothesis regardless of the differences.

Conclusion

The findings of this study, supported by previous literature, reinforce the clinically observed hypothesis that developmental and functional differences are perceived between left and right hemiplegic cerebral palsy. However, pediatric rehabilitation professionals must adopt a holistic perspective when assessing and managing children with hemiplegic CP considering not only the severity of the brain lesion and culturally embedded norms that may shape perceptions of developmental, cognitive, and functional progress. These insights underscore the importance of integrating both neurobiological and sociocultural factors into individualized rehabilitation strategies.

Recognizing hemispheric differences in hemiplegic cerebral palsy can guide therapists toward more individualized, culturally sensitive rehabilitation strategies that optimize developmental outcomes for children with CP.

Author Contributions

All authors significantly contributed to the work reported, including conception, study design, execution, data acquisition, analysis, and interpretation. They actively participated in drafting, revising, or critically reviewing the manuscript, provided final approval of the version to be published, agreed on the journal submission, and accepted accountability for all aspects of the work.

Data Availability Statement

The authors will transparently provide the primary data underpinning the findings or conclusions of this article, without any unjustified reluctance. If need from editorial team.

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Conflicts of Interest

The authors declare no potential conflicts of interest related to the research, writing, or publication of this work.

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