



Abstract Book

16th International Conference on
**Developmental
Coordination
Disorder**

24 - 26 July 2026
Hong Kong

Conference Schedule 會議日程

Friday, July 24, 2026 2026年7月24日 (星期五)	
8:00 AM	Bus departing the hotel 巴士從酒店出發
9:00 - 9:30 AM Lecture Theatre 1	Welcome & Opening Remarks 歡迎與開幕致辭 1. Lion Dance (舞獅) presided by Professor CS Lau (劉澤星教授) 2. Opening recording from Dr Christine Choi Yuk-lin, JP (蔡若蓮博士, JP) 3. Mr Tommy Cheung Yu-Yan, GBM, GBS, JP (張宇人議員, 大紫荊勳賢, GBS, JP) 4. Professor Yiu-fai Cheung (張耀輝教授) 5. Ms Rachel Leung (梁惠玲女士) 6. Dr Jill Zwicker
9:30 - 10:30 AM Lecture Theatre 1	Keynote 1 - Professor Jing Hua "Early Detection and Intervention for Children at Risk of DCD" 專題演講(一) 花靜教授, 主任醫師, 上海市第一婦嬰保健院, 同濟大學醫學院, 主題: 「發展性協調障礙高風險兒童的早期檢測與介入」
10:30 - 11:00 AM Foyer	Networking/Coffee break 茶歇

11:00 - 1:00 PM Lecture Theatre 1	Verbal session 1 - Awareness & Advocacy 口頭報告(一) 主題: 認知與倡導 1. The unseen struggle: Mapping and addressing the awareness gap surrounding Developmental Coordination Disorder Presenter: Dr. Emily J. Meachon (University of Basel) 2. Partnering with families to co-create capacity building and advocacy toolkits for developmental coordination disorder Presenter: Dr. Jill Zwicker (University of British Columbia) 3. Awareness and knowledge of DCD in secondary education: an examination of teacher expertise Presenter: Dr. Griet Warlop (Manchester Metropolitan University) 4. Awareness of Developmental Coordination Disorder in The Netherlands: What do Parents of children with DCD need? Presenter: Dr. Dorothee Jelsma (University of Groningen) 5. Setting the Research Priorities for Developmental Coordination Disorder (DCD) in the UK Presenter: Dr. Catherine Purcell (Cardiff University) 6. Academic concerns and educational outcomes of individuals with DCD: A systematic review Presenter: Dr. Catherine Purcell (Cardiff University) 7. Subtypes in Developmental Coordination Disorder: what do we know so far? A systematic review. Presenter: Professor Evi Verbecque (Hasselt University) 8. Learning Challenges, Movement Challenges: Motor Deficits in Special Education Presenter: Dr. Dorothee Jelsma (University of Groningen)
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11:00 - 1:00 PM Lecture Theatre 2	Verbal session 2 – Assessment 口頭報告(二) 主題：評估 1. Clinical profile of children with Developmental Coordination Disorder in Hong Kong Presenter: Dr. Tang May Ling & Dr. Chan Pui Suen (Hong Kong SAR Child Assessment Service) 2. PERF-FIT Travels to Europe: Risks of using norm-referenced motor tests without cultural adaptation Presenter: Professor Bouwien Smits-Engelsman (North-West University) 3. Using the DASH-2 to understand handwriting difficulties in DCD and dyslexia Presenter: Professor Anna Barnett (Oxford Brookes University) 4. Differential Motor Assessment Outcomes on the MABC-3 and BOT-3 Among Neurodivergent and Neurotypical Children Presenter: Dr. Priscila Tamplain (University of Texas at Arlington) 5. Unpacking Postural Control: Comparing Balance Items Across PERF-FIT, KTK, and Kids-BESTest-2 in Community-Based School-Aged children Presenter: Professor Evi Verbecque (Hasselt University) 6. Collaborative Development of an Autism-Friendly Toolkit for Administering the MABC-3 Test Presenter: Dr. Priscila Tamplain (University of Texas at Arlington) 7. Assessing Activities of Daily Living in Children Aged 5-10 Years: Rasch Validation of the DCD Daily-Q-CN in Community Contexts Presenter: Shuo Sun (Shenzhen Children's Hospital) 8. What do teachers really know about DCD? Development of the DCD-TKS (teacher knowledge scale) Presenter: Professor Jacqueline Williams (Victoria University)
1:00 - 2:00 PM Foyer	Lunch 午餐

2:00 - 3:00 PM Lecture Theatre 1	Symposium 1 Revision of international clinical practice guidelines: Update on progress 研討會(一) 國際臨床實踐指引修訂：最新進展
3:00 - 5:00 PM Lecture Theatre 1	Verbal session 3 - Early identification 口頭報告(三) 主題：早期識別 1. Diagnosis and management of children with Developmental Coordination Disorder in Hong Kong Presenter: Chui Mun Yee and Chan Mei Yu (Hong Kong SAR Child Assessment Service) 2. Association of developmental coordination disorder with early-life ecological environments in preschoolers: nationwide exposome evidence from 551 Chinese cities Presenter: Dr. Yongzhou Liang (Tongji University) 3. Association of Maternal Pre-pregnancy Body Mass Index with Suspected Developmental Coordination Disorder in Preschool Children: A National Cohort Study Presenter: Huijuan Peng (Tongji University) 4. Predicting later motor status from early DCD severity: a two-timepoint longitudinal study Presenter: Dr. Reza Abdollahipour (Palacký University Olomouc) 5. Risk factors for developmental coordination disorder: Results from a systematic review Presenter: Dr Jill Zwicker (University of British Columbia) and Dr. Christian Hyde (Deakin University) 6. Parent perspectives on early diagnosis of DCD: Implications for future care pathways Presenter: Olivia Tsihlias (University of British Columbia)

3:00 - 5:00 PM Lecture Theatre 2	Verbal session 4 – Intervention 口頭報告(四) 主題：介入措施 1. Early intervention approaches for children with/at risk of Developmental Coordination Disorder: An updated scoping review of recent research Presenter: Olivia Tsihlias (University of British Columbia) 2. Grey matter volume changes after CO-OP intervention in children with co-occurring autism spectrum disorder and developmental coordination disorder Presenter: Sarah Tischer (University of British Columbia) 3. Effects of an Inclusive Physical Activity Intervention for Preschoolers with Probable Developmental Coordination Disorder Presenter: Dr. Jane Jie Yu (Zhejiang University) 4. School-based Motor Skill Interventions for Children and Adolescents with Developmental Coordination Disorder: A Systematic Review and Meta-Analysis Presenter: Dr. Piritta Asunta (Jamk University of Applied Sciences) 5. Virtual reality-based interventions on physical abilities in children with developmental coordination disorder: Meta analysis with moderating and meta regression effects Presenter: Syed Zain Ul Abidin (China Medical University) 6. eHealth for mental health in DCD: What we have learnt from multiple deliveries of a parent mediated physical activity intervention Presenter: Professor Jacqueline Williams (Victoria University) 7. Choice-based autonomy support intervention enhances motor competence in children with developmental coordination disorder Presenter: Dr. Miriam Palomo (Universidad Complutense de Madrid)
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5:00 - 6:00 PM Foyer	Poster session 1 & light refreshments 海報展示與下午茶 1. Disorder of Attention, Motor Control and Perception in Grade 1 Boys and Girls Presenter: Dr. Monique de Milander (University of the Free State) 2. Are traits of developmental coordination disorder and autism spectrum disorder associated with physical activity and sedentary behavior in adults? Presenter: Dr. Priscila Tamplain (University of Texas at Arlington) 3. Tracking sleep in families of children with DCD: What objective data reveal Presenter: Dr. Priscila Tamplain (University of Texas at Arlington) 4. Study Protocol of Comparative Effectiveness, Safety and Feasibility of Interventions to Improve Motor Skills in Children with Developmental Coordination Disorder: A Systematic Review and Network Meta-analysis Presenter: Shine H. Lin (The University of Hong Kong) 5. Internalizing problems and heart rate variability in children with developmental coordination disorder Presenter: Dr. Yao-Chuen Li (China Medical University) 6. Salivary cortisol and internalizing-externalizing problems in children with developmental coordination disorder Presenter: Huynh-Truc Tran (China Medical University) 7. Motor Coordination Difficulties in School-Aged Children Born Preterm: A Comparison with Term-Born Typically Developing Children and Those with Neurodevelopmental Disorders Presenter: Nanako Hironaka (Nagasaki University)
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8. A prospective study on the impact of Developmental Coordination Disorder traits on emotional/behavioral problems during the transition from preschool to school age
Presenter: Sumika Fujisawa (Ochanomizu University)
9. Genome-wide association studies of gross- and fine-motor coordination in the Norwegian Mother, Father and Child Cohort Study (MoBa)
Presenter: Dr. Hayley Mountford (University of Edinburgh)
10. Risk of DCD and behavioural problems in preterm children aged 5 to 10 years
Presenter: Professor Barbara Caravale (Sapienza University of Rome)
11. Foot Morphology Influences Plantar Pressure Shifts and Standing Balance in Children with Developmental Disorders
Presenter: Toshiya Urushihata (Aomori University of Health and Welfare)
12. Brain Activation During Action Observation and Motor Imagery Using Self-Generated Own- and Other-Persons' Hand Videos
Presenter: Kengo Fujiwara (Kyoto University)
13. Accuracy and Temporal Variability of Hand-Foot Interlimb Coordination in Children with Developmental Coordination Disorder
Presenter: Professor Iwanaga Yuto (Kyoto University)
14. Research protocol investigating mechanisms of anticipatory postural adjustment deficits in children with developmental coordination disorder
Presenter: Ludvík Valtr (Palacký University Olomouc)

15. Investigating reach-to-manipulate coordination during online correction in children with developmental coordination disorder using principal component analysis
Presenter: Quting Huang (The Hong Kong Polytechnic University)
16. Establishing Culturally Relevant Norms for the MABC-2 in South African Children
Presenter: Dané Coetzee (North-West University)
17. Beyond motor skills: longitudinal outcomes of children with developmental coordination disorder through adolescence
Presenter: Marinella Garotta (Parole e Movimento - Lainate)
18. Watch me do it: A free-to-access video resource to support motor learning in children with DCD
Presenter: Dr. Griet Warlop (Manchester Metropolitan University)
19. Fine Motor Function Characteristics and Their Correlation with Symptom Severity in Children with Attention-Deficit/Hyperactivity Disorder Comorbid with Developmental Coordination Disorder Based on MABC-2
Presenter: Chunmiao Wang (China Institute of Sport Science)

6:15 PM

Bus departing the conference venue
巴士從會議場地出發

Saturday, July 25, 2026
2026年7月25日 (星期六)

8:15 AM	Bus departing the hotel 巴士從酒店出發
9:00 - 10:00 AM Lecture Theatre 1	Keynote 2 – Professor Anna Barnett “Moving into Adulthood: The Progression and Impact of DCD” 主題演講(二) Anna Barnett 教授，牛津布魯克斯大學心理學研究中心心理學教授 主題：邁向成年：「發展性協調障礙的進程與影響」
10:00 - 10:30 AM Foyer	Networking/Coffee break 茶歇
10:30 - 12:30 PM Seminar Room 2	Verbal session 5 - Mechanisms 口頭報告(五) 主題：機制 1. Kinematic gait adaptations when dual-tasking in children with Developmental Coordination Disorder compared to typically developing peers: A preliminary study Presenter: Michelle Verhoeven (Ghent University) 2. Finger and Toe Haptic Perception in Children with and without Developmental Coordination Disorder Presenter: Wei-Shan Chen (National Hsing Hua University) 3. Sleep Disturbances in Children with Developmental Coordination Disorder: A Meta-analysis Presenter: Junqi Li (The Shanghai University of Sport) 4. Observing and predicting one's own throw from a first-person perspective: An EEG study Presenter: Dr. Yosuke Kita (Keio University) 5. Impaired toilet training and bladder and bowel dysfunction in children with Developmental Coordination Disorder: an underreported issue Presenter: Mathilde Joos (Ghent University)

	6. Genetic variants in developmental coordination disorder: Genome-wide association studies of gross- and fine-motor coordination Presenter: Dr. Hayley Mountford (University of Edinburgh) 7. Characterizing wrist proprioceptive precision among preschoolers with developmental coordination disorder Presenter: Dr. Yu-Ting Tseng (National Tsing Hua University) 8. Exploring effective video conditions for combined action observation and motor imagery learning in children: A preliminary study with typically developing children Presenter: Hanna Park (Seoul National University)
10:30 - 12:30 PM Lecture Theatre 1	Verbal session 6 - Adults 口頭報告(六) 主題：成人 1. Participation Patterns at the Home, School, Community and Workplace: Perspectives of Youth and Young Adults with Developmental Coordination Disorder Presenter: Cheng Zeng (Lethbridge Layton Mackay Rehabilitation Center) 2. Regional Characteristics of Plantar Sensation in Developmental Coordination Disorder: A Comparative Study with Typically Developing Adults, Focusing on the first metatarsal head and Calcaneal Presenter: Dr. Kanta Kimura (Aomori University of Health and Welfare) 3. Is procedural perceptual-motor learning related to perceived and real motor levels in adults with and without Developmental Coordination Disorder? Presenter: Sarah Seiwert (University of Toulouse)

	4. Cognitive Resource Reallocation during Procedural Learning in Adults with Developmental Coordination Disorder: Behavioral and EEG Evidence from a Dual-Task Paradigm Presenter: Yuxuan Hu (The Shanghai University of Sport) 5. Sports participation in Autistic adults with and without Developmental Co-ordination Disorder (DCD/Dyspraxia) Presenter: Jennifer Snowball (Olga Tennison Autism Research Center) 6. Perceived barriers, facilitators, and their associations with physical activity in adults with developmental coordination disorder Presenter: Dr. Scott Ruddock (RMIT University) 7. The usability of exergames to promote active living and participation among adolescents with developmental coordination disorder (DCD) Presenter: Taha Yassine Tamlali (Radboud University) 8. Resting-state functional connectivity and its relation to motor learning in adults with developmental coordination disorder Presenter: Professor Frederik Deconinck (Ghent University)
12:30 - 1:30 PM Foyer	Lunch 午餐
1:30 - 2:30 PM Foyer	Poster session 2 海報展示 1. Motor contributions to interpersonal synchrony in autistic children Presenter: Matthew McQueen (University of Western Australia) 2. The Relationship between Motor Performance, Physical activity and Quality of Life in School-Aged Children Presenter: Professor Bouwien Smits-Engelsman (North-West University)

	3. The Effect of Sibling on Motor Development in Preschoolers of China: Mediating Effects of Sleep Quality Presenter: Dr. Meiqin Wu (Tongji University) 4. Effects of Ball Skill Interventions for Core Symptoms in Children with Developmental Coordination Disorder: A Network Meta-Analysis Presenter: Zisu Wang (Zhejiang University) 5. Co-Design Protocol for the ModiSchool Intervention Study Enhancing Motor Competence, Health-Related Fitness, and Psychosocial Wellbeing in Children with Motor Difficulties Presenter: Dr. Piritta Asunta (Jamk University of Applied Sciences) 6. Development, Reliability and Validity of the Japanese version of DCDDaily-Q Presenter: Takuya Higashionna (Tokyo Kasei University) 7. Motor coordination and emotional & behavioural difficulties in children with congenital asymptomatic CMV infection at school age: Implications for DCD risk Presenter: Professor Barbara Caravale (Sapienza University of Rome) 8. Developmental coordination disorder research in Asia Western Pacific region: scoping review Presenter: Dr. Catherine Capio (Hong Kong Metropolitan University) 9. Motor Profiling in Children with Autism Spectrum Disorder (ASD) Presenter: Yeung Tsz Yu (The University of Hong Kong)
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10. Effectiveness of motor coordination items for screening neurodevelopmental disorders
Presenter: Ryoichiro Iwanaga (Nagasaki University)
11. The effects of physical inactivity and obesity on internalising problems in children with Developmental Coordination Disorder over time: Evidence from the CATCH study
Presenter: Noah Erskine (The University of Queensland)
12. A feasibility study of a 10-week bespoke interactive motor skills and mentoring programme focusing on hand skills and body strength
Presenter: Rosaline Van de Weyer (Anglia Ruskin University)
13. Gross motor interventions improve coordination, visual perception and mental health in children with traits of neurodevelopmental disorders
Presenter: Takahiro Otsubo (Itami Municipal Itami Nishi Junior High School)
14. Preliminary Outcomes of Virtual Reality-based Exergame on Cardiorespiratory Fitness in Children with Developmental Coordination Disorder
Presenter: Dr. Ya-Ju Ju (China Medical University)
15. Co-producing a Manualised Version of the Cognitive Orientation to Daily Occupational Performance Intervention for Handwriting & CO-OP Write
Presenter: Dr. Mellissa Prunty (University of Limerick)

16. Does physical activity mediate the relationship between motor difficulty and depression?
Presenter: Professor Bo Shen (Central China Normal University)
17. Physical activity mediates the relationship of motor coordination with positive affect in children with probable DCD
Presenter: Dr. Kathlyne Eguia (ThinkKIDS)
18. Machine learning classification of children with probable developmental coordination disorder from their hand movement joint kinematics: an exploratory study
Presenter: Quting Huang (The Hong Kong Polytechnic University)
19. Understanding motor inhibition among DCD children through interrupted gait initiation: Findings and implications from a pilot study
Presenter: Cheuk Yin Ho (The Chinese University of Hong Kong)
20. Sensory and motor impairments in childhood apraxia of speech: evidence from a new cohort
Presenter: Dr. Şermin Tükel (Izmir University of Economics)

21. Self-Efficacy Questionnaire for School-Aged Children with Developmental Coordination Disorder: Item Development
Presenter: Kazuko Kamijo (Kura Zemi Co., Ltd)
22. Development of a Typing Assessment Protocol (TAP)
Presenter: Professor Anna Barnett (Oxford Brookes University)
23. The co-occurrence of developmental coordination disorder and autism spectrum disorder traits increases the burden of poor quality of life in adults
Presenter: Dr. Priscila Tamplain (University of Texas at Arlington)
24. Cortical involvement in postural control in children with developmental coordination disorder
Presenter: Antonella Iannotta (Université libre de Bruxelles)
25. Dysfunction of the Autonomic Nervous System in Children with ADHD and Co-morbid DCD and its Association with Motor Impairments
Presenter: Jiaxin Chen (China Institute of Sport)
26. Decoding Fine-Motor Deficits in DCD: Contactless Kinematic Analysis Across Motor Competence Levels in Children
Presenter: Yangjia Zhang

2:30 - 4:00 PM Lecture Theatre 1	Symposium 2 Expanding the Impact: Results from the Impact for DCD International Adult Survey 研討會(二) 擴大影響力：國際成人DCD影響力調查結果
4:15 PM	Bus departing the conference venue 巴士從會議場地出發
4:00 - 6:00 PM	Break 休息
6:00 PM	Bus departing conference hotel for gala dinner 巴士從會議酒店出發前往晚宴
6:30 - 10:00 PM	Gala Dinner Venue: China Club, 14/F, Old Bank of China Building, Bank St, Central 晚宴 地點：中國會，中環德輔道中2A中國銀行大廈14樓
10:00 PM	Bus departing gala dinner for conference hotel 巴士從晚宴場地出發前往會議酒店

Sunday, July 26, 2026
2026年7月26日 (星期日)

8:15 AM	Bus departing the hotel 巴士從酒店出發
9:00 - 9:30 AM Lecture Theatre 1	ISRA-DCD announcements and awards Advocacy group video ISRA-DCD 公告與頒獎 倡導團體影片
9:30 - 11:00 AM Seminar Room 2	Verbal Session 7 – Brain & Behavior 口頭報告(七) 主題：大腦與行為 1. Using EEG to measure cortical control of reactive balance recovery in children with DCD Presenter: Dr. Griet Warlop (Manchester Metropolitan University) 2. Understanding the impact of resting-state oscillatory power on motor imagery ability in children with and without DCD: the role of theta power Presenter: Samaneh Nahravani (Deakin University)

- Longitudinal changes in frontoparietal brain activity and motor performance in children with Developmental Coordination Disorder: An fNIRS study
Presenter: Maja Van Grinderbeek (Hasselt University)
- Response Inhibition in Children with DCD and ADHD: A Mobile-EEG and Dual-Task Approach
Presenter: Dr. Emily Meachon (University of Basel)
- Cognitive Profiles and Associated Factors in Children with comorbid ADHD and DCD
Presenter: Professor Lin Wang (Capital Medical University)
- Impact of long-term motor-based interventions on brain structure and function in children with Developmental Coordination Disorder: A systematic review
Presenter: Maja Van Grinderbeek (Hasselt University)

9:30 - 11:00 AM Lecture Theatre 1	Verbal Session 8 - Physical and Mental Health 口頭報告(八) 主題：身心健康
	1. Joint association of physical activity and screen exposure with subsequent suspected developmental coordination disorder: A population-based study in China Presenter: Dr. Liang Du (Tongji University)
	2. Teachers' perceptions of strengths and positive traits in children with neurodevelopmental conditions Presenter: Dr. Amy De Roubaix (Radboud University Medical Center)
	3. Quality of Life in Children with Developmental Coordination Disorder (DCD): A Large-Scale Study of South African Children Presenter: Professor Bouwien Smits-Engelsman (North-West University)
	4. The relationships between parental psychological distress and mental health in children with developmental coordination disorder Presenter: Suraya Rehmat (China Medical University)
	5. Move2Engage: Effects of group-based exercise interventions on physical activity, wellbeing and mental health in children with DCD Presenter: Dr. Melissa Licari (The Kids Research Institute Australia)
	6. Differences in resilience, hope, and sense of coherence among adolescents with ADHD, DCD, ADHD and DCD, and typical adolescents Presenter: Yael Rozman (The Hebrew University of Jerusalem)

11:00 - 11:30 AM Foyer	Networking/Coffee break 茶歇
11:30 - 12:30 PM Lecture Theatre 1	PANEL: ISRA-DCD Board Perspectives: Conference take-aways + future research opportunities & challenges 座談會：ISRA-DCD 理事會觀點 會議重點回顧與未來研究機會及挑戰
12:30 - 1:00 PM Lecture Theatre 1	Closing Remarks 閉幕致辭
1:00 - 2:00 PM Foyer	Lunch 午餐
2:15 PM	Bus departing the conference venue 巴士從會議場地出發
2:00 - 5:00 PM Lecture Theatre 1	Professional Workshop 發展性協調障礙專業工作坊
5:30 PM	Bus departing the conference venue 巴士從會議場地出發

An abstract background featuring a large, stylized orange geometric pattern. The pattern consists of several thick, rounded lines that intersect to form a central star-like shape with six points. The lines have a slight gradient and rounded ends, creating a modern, architectural feel. The overall color palette is warm, dominated by various shades of orange and red against a white background.

Keynote Speaker 1

Early Detection and Intervention for Children at Risk of DCD

Author: Professor Jing Hua

Chief Physician, Developmental-Behavioral Pediatrics, Shanghai First Maternity and Infant Hospital Director,
Women and Children's Health Care Department, Shanghai First Maternity and Infant Hospital Professor,
School of Medicine, Tongji University, Shanghai

Developmental coordination disorder (DCD) is a common yet persistently under-recognized neurodevelopmental condition. Growing evidence indicates that its functional impact can be substantially mitigated when identification and supportive intervention are initiated during the preschool years, rather than deferred until school-age academic or functional failure makes impairments overt.

Recent findings from our work delineate three key advances in the early detection of DCD. First, we have strengthened preschool screening capacity by validating culturally adapted tools, notably the Chinese version of the Little Developmental Coordination Disorder Questionnaire (LDCDQ-CH), for the early identification of motor coordination difficulties among Chinese preschoolers. This work provides a practical foundation for case-finding and early guidance within community and clinical settings. Second, we have developed and externally validated a large-scale bioecological early screening model for DCD that integrates maternal, environmental, and perinatal

predictors. This model was constructed in a nationwide preschool population and independently validated in a clinical sample with confirmed DCD, demonstrating its potential for scalable, cost-effective early risk triage. Third, emerging mechanistic investigations from our group are beginning to link motor developmental vulnerability in DCD to epigenetic signals, particularly DNA methylation markers, opening a potential pathway toward biomarker-informed early risk stratification and more targeted prevention and intervention strategies.

Collectively, these findings support a population-feasible early identification pathway that enables prioritization of high-risk children, including specific gestational-age-related risk groups, and lays the groundwork for precision prevention through the integration of developmental, clinical, and biological data within early-life health services.

An abstract background featuring a large, stylized orange geometric pattern. The pattern consists of several thick, rounded lines that intersect to form a central star-like shape with six points. The lines have a slight gradient and rounded ends, creating a modern, architectural feel. The overall color palette is warm, dominated by various shades of orange and peach against a white background.

Verbal Session 1 -

Awareness and Advocacy

The unseen struggle: Mapping and addressing the awareness gap surrounding Developmental Coordination Disorder

Authors:

Emily J. Meachon, University of Basel

Amy De Roubaix, Ghent University; Radboud University Medical Center

DCD is a lifelong, impactful condition, yet it is consistently underestimated and frequently misunderstood. Several cross-sectional studies have sought to quantify the rates of DCD awareness across various interest groups and populations. However, a synthesis of these studies was lacking. Therefore, we conducted a semi-systematic review of the existing research on DCD awareness and contextualized these results with interpretation of areas needed to improve DCD awareness on local and global scales. A total of 12 studies on DCD awareness were included in this review from the last 20 years, representing samples from 13 countries, and numerous backgrounds as (a) stakeholders or members of the general public, (b) educators, or (c) healthcare professionals. Across the studies, DCD awareness was concerning and fairly consistently low. When comparing results by interest groups (public, educators, healthcare professionals), healthcare professionals showed the most promising results across studies, frequently reaching awareness rate of at least 50%. This included studies indexing awareness of

DCD in general as well as those assessing specific but standard DCD descriptions. Broadly, we speculate that the low awareness rates can be improved by using consistent nomenclature, increasing scientific output and interest, and improving research, advocacy, and knowledge sharing. We further provide examples of numerous promising initiatives have already been established and target these areas, as well as new routes to consider in the future. For example, we suggest (1) crossing field-based boundaries by forging joint efforts between the DCD movement and those of broader neurodiversity, (2) increasing DCD visibility in the public domain, (3) providing accessible resources while preventing misinformation, and (4) taking small steps in local communities which can ultimately lead to big wins.

Partnering with families to co-create capacity building and advocacy toolkits for developmental coordination disorder

Authors:

Jill Zwicker, University of British Columbia and BC Children's Hospital Research Institute

Erin Klein, University of British Columbia and BC Children's Hospital Research Institute

Introduction

International research has confirmed that Developmental Coordination Disorder (DCD) is under-recognized and under-diagnosed. Best practice is early identification to support access to early intervention, mitigating the negative developmental trajectory associated with this condition. Our national research has found that Canadian families whose children have or are at risk for DCD are identifying motor difficulties in their children on average at 2-3 years of age but waiting 1-2 years to seek help. Families indicated that limited support and miscommunication with primary care providers once they sought medical advice for their concerns, contributed to longer wait-times for diagnostic services, with an average age of 8 years old when their child was diagnosed. They have acknowledged that greater familiarity about DCD amongst families would facilitate advocacy efforts for early identification and intervention. Thus, this project aimed to cocreate toolkits for families to increase knowledge on DCD etiology, symptomology, and best practices propelling timely diagnostic and rehabilitative services and supports.

Methods

Strategic partnerships were developed with families with lived experience to co-develop DCD toolkits for families. Families were recruited through social media postings, use of a DCD research database, and patient advisory groups. Online focus groups were conducted to co-create content and visual layout of the toolkit.

Results

This toolkit provides families with tools and information to increase understanding about DCD, resources to support care and management, and advocating for diagnostic services. The toolkit is being translated into several languages.

Conclusion

This tool addresses the parent-identified gap to build capacity amongst families for early identification and early intervention. Development of this toolkit also demonstrates the importance of collaboration and co-creation of knowledge translation products,

driven by the needs of those who will use and benefit from these resources.

Awareness and knowledge of DCD in secondary education: an examination of teacher expertise

Authors:

Griet Warlop, Department of Sport and Exercise Sciences, Manchester Metropolitan University

Lien Valepyn, Department of Movement Sciences, KU Leuven

Laure Geirnaert, Department of Movement and Sports Sciences, Ghent University

Lies Blontrock, Department of Movement and Sports Sciences, Ghent University

Introduction

Individuals with DCD often face persistent academic challenges. An increasingly well-documented barrier to effective support and positive outcomes is the limited awareness of the condition among the general population, and particularly among educational staff. Yet, few studies have directly examined this in teachers. This study aimed to comprehensively document secondary school teachers' awareness, knowledge, and preparedness to support students with DCD and motor difficulties. Methods: One hundred and five Flemish secondary school teachers completed an online survey, without prior knowledge of its focus. The survey included: 1) evaluation of three case vignettes presenting a pupil with increasingly explicit indicators of DCD and motor difficulties; 2) questions on teachers' self-reported knowledge and expertise of DCD; and 3) quiz-style items assessing actual knowledge and common

misconceptions. Open- and close-ended responses were analysed qualitatively and quantitatively. Results: In the first case vignette, despite mentioning hints towards motor difficulties (e.g., writing neatly in a diary, doing crafts), only 49% of teachers recognised difficulties in the motor/physical domain, while social (91%) and emotional (78%) issues were more readily identified. Across all vignettes, most teachers acknowledged the need for additional support (87–97%). Although many teachers reported understanding what DCD is (72%), its symptoms (67%), and co-occurring conditions (63%), fewer felt confident about how to support affected students (45%). Knowledge gaps and misconceptions were common, particularly regarding associated difficulties (e.g., working memory, sensory processing, hypermobility) and secondary consequences such as fatigue, which nearly 60% did not recognise. Conclusion: Secondary school teachers show partial awareness of DCD but

limited understanding of its broader impact and secondary consequences. While most recognise the need for support, many feel insufficiently equipped to provide it. Further analyses will examine differences related to teacher's training and educational role (physical education teacher or not).

Awareness of Developmental Coordination Disorder in The Netherlands: What do Parents of children with DCD need?

Authors:

Dorothee Jelsma, Developmental and Clinical Neuropsychology, University of Groningen, the Netherlands

Melissa Licari, The Kids Research Institute Australia, Nedlands, Australia

Amy de Roubaix, Department of Rehabilitation Sciences, Ghent University, Ghent, Belgium

Jessica Lust, Behavioural Science Institute, Radboud University, Faculty of Social Sciences, Nijmegen, The Netherlands

Introduction

Children with Developmental Coordination Disorder (DCD) and their families face many challenges in daily life. The international ImpACT for DCD movement is collecting large-scale evidence of unmet needs to improve awareness and support worldwide. This study presents findings from The Netherlands.

Method

Parents of 83 children aged 4-18 years with DCD completed the ImpACT for DCD survey, tailored to the Dutch society. The survey domains included diagnosis, intervention, activity/participation, education, and social/emotional issues.

Results

Average age of seeking help was 4.4 years (SD 2.85), with the majority seeing a physiotherapist (54%) or general practitioner

(GP; 14.7%). The diagnosis was most frequently provided by a rehabilitation physician (69.4%) at 7.7 years (SD 2.2). The most frequent motor problems reported were slower performance (99%), getting dressed (91.7%), eating (89.6%), self-care (81.3%), fine motor tasks (82.3-90.6%), ball games (77.1%), cycling (68.8%), and swimming (78.1%). DCD was not known by friends (98.8%), family (97.6%), class teachers (76.8%), Physical Education teachers (58.5%) and GPs (37.8%). Most children (90.9%) received therapy: physical therapy (89%); occupational therapy (69%); speech therapy (56%); psychotherapy (23%). The parents were often satisfied (64 %) with the therapy-content, but 53% indicated a lack of support/advice to be able to help their child. Increased fatigue was reported during motor activities (95%), and at the end of a school day (89%) and non-school day (59%) compared to peers. Alarming, 78% of parents worried about the impact of their child's motor problems on the social

and emotional well-being.

Conclusion

The results indicate different gaps in knowledge amongst professionals. Importantly, DCD needs to become a topic in the curriculum of health care and educational professionals to improve the support for children with DCD and their families.

Setting the Research Priorities for Developmental Coordination Disorder (DCD) in the UK

Authors:

Catherine Purcell, School of Healthcare Sciences, Cardiff University

Kate Wilmut, Centre for Psychological Research, Oxford Brookes University

Introduction

Developmental Coordination Disorder (DCD) significantly affects daily functioning, mental health and quality of life, yet remains under-recognised and underfunded in the UK compared to other neurodevelopmental conditions. This study aimed to establish the first UK-wide research agenda for DCD using the James Lind Alliance (JLA) Priority Setting Partnership (PSP) methodology.

Methods

A multi-stakeholder Steering Group (SG) was convened, including individuals with living experience, parents, professionals, academics and JLA representatives. The PSP followed four stages: (1) gathering uncertainties via an open survey; (2) verifying questions against existing evidence; (3) interim prioritisation through a second survey and (4) a final online consensus workshop to agree a Top 10 priorities. Surveys were disseminated nationally through partner organisations,

social media and professional networks. Responses were coded, grouped into themes and refined into summary questions with 18 shortlisted for the final workshop.

Results

A total of 309 participants submitted 920 uncertainties at stage one, representing five stakeholder groups: adults and children with DCD, parents/carers, health and education professionals and academics. After screening and thematic analysis, 50 summary questions were generated across seven domains, including diagnosis, intervention, lifespan changes and mental health. Evidence checks confirmed 49 questions as genuine uncertainties. In the interim prioritisation survey (N=222), collectively over 50% of respondents identified two key priorities: What are the mental health needs of people living with DCD and how can these be managed and supported? and How does DCD change over the lifespan and at different life stages (e.g., puberty, adulthood, older adults)? The final workshop achieved consensus on the Top 10 research priorities for DCD in the UK.

Discussion

This PSP has delivered the first stakeholder-driven research agenda for DCD in the UK, highlighting urgent needs that will guide researchers, funders and policy makers in the UK to ensure future research aligns with real-world priorities.

Academic concerns and educational outcomes of individuals with DCD: A systematic review

Authors:

Miri Tal-Saban, School of Occupational Therapy, Hebrew University of Jerusalem, Jerusalem, IS

Catherine Purcell, School of Healthcare Sciences, Cardiff University, Cardiff, UK

Claire Sangster Jokic, University of Applied Health Sciences, Zagreb, HR

Dido Green, Department of Rehabilitation, School of Health and Social Welfare, Jönköping, Sweden

Matthew Kwan, Department of Child and Youth Studies, Brock University, St. Catharines, CA

Ann Kennedy-Behr, School of Health, University of the Sunshine Coast, Sippy Downs, QLD, Australia and

Wakai-Waian Healing, Nambour, QLD, AUS

Sabine Vincon, Division of Occupational Therapy and Arts Therapies, Queen Margaret University, Edinburgh, UK and Clinic for Child Neurology and Social Paediatrics, Child Centre Maulbronn, DE

Jill G. Zwicker, Department of Occupational Science & Occupational Therapy, University of British Columbia and BC Children's Hospital Research Institute, Vancouver, CA

Introduction

Developmental Coordination Disorder (DCD) is a common neurodevelopmental disorder characterised by impaired motor coordination and motor learning. DCD can affect school performance, but the extent of academic difficulties experienced by individuals with DCD has not been systematically reviewed.

Methods

As part of the update to international clinical practice guidelines, our group conducted a systematic review of the literature to examine the consequences of DCD. We searched five databases (MEDLINE, Embase, CINAHL, PsycINFO and Web of Science) and imported references into Covidence. After duplicates were removed, two independent reviewers screened 5196 articles. A total of 236 articles met our inclusion and exclusion criteria.

Of these, 28 articles examined school and academic difficulties experienced by individuals with DCD.

Results

We are in the process of extracting data and evaluating the quality of evidence of included studies. While the majority of studies focused on elementary school-aged children, one study examined school readiness of young children, two studies were conducted with adolescents, and four studies examined educational outcomes in higher education and adulthood. Overall, studies found that individuals with DCD have poorer handwriting legibility and slower speed of writing compared to students without DCD. Handwriting difficulties also had wider repercussions that affected the quality of written composition and academic achievement. Compared to peers, students with

DCD had significantly poorer performance in reading, writing, and spelling. Recent evidence also suggests that individuals with DCD have difficulty with number fact retrieval and procedural calculation, and show lower mathematical capacity compared to students without DCD. DCD during childhood may have a lasting impact on educational outcomes in adulthood, particularly among women.

Conclusion

While primarily considered a motor disorder, DCD can have significant impact on academic achievement and long-term educational outcomes. Students with DCD would benefit from school supports and accommodations to reach their academic potential.

Subtypes in Developmental Coordination Disorder: what do we know so far? A systematic review.

Authors:

Evi Verbecque, Rehabilitation Research Centre (REVAL), Faculty of Rehabilitation Sciences, Hasselt University, Diepenbeek, Belgium

Jessica Lust, Behavioural Science Institute, Radboud University, Nijmegen, the Netherlands

Bouwien Smits-Engelsman, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Introduction

Developmental Coordination Disorder (DCD) is a highly heterogeneous disorder. Despite all efforts to identify key areas of difficulties in children with DCD, its large heterogeneity is reconfirmed each time. Our previous systematic review and metaanalysis specifically revealed that the magnitude of differences between children with DCD and their typically developing peers fluctuates across domains of functioning, including but not limited to executive function, academic skills, quality of life, sensory functions, and physical fitness. Profiling or subtyping children with DCD has gained much interest over the last two decades and could aid in understanding 'the DCD group' better.

Participants and methods

We conducted a systematic review (CRD420251237685), searching five databases: Web of Science, Scopus, PubMed, Embase, and PsycInfo. The search terms comprised controlled

terminology and free-text terms and were composed under the guidance of an information specialist. Studies were considered relevant if they: (P) investigated children with DCD (aged 0–18 years), with or without comorbidities; and (I) identified subtypes through clustering based on a statistical clustering analysis. The CASP was used to address methodological quality, and the quality of the evidence was estimated with GRADE.

Results

Of the 1,719 search results, 12 were included for analysis. Two studies explored clusters uni-dimensionally (motor-only and mental health-only). Ten studies included multiple domains of functioning: motor (n=10), sensory functions (n=6), fitness (n=3), cognitive functions (n=3), executive functions (n=3), mental health (n=1), and participation (n=1). The number of clusters identified varied between four (n=4) and six (n=1). The clusters included profiles indicating no difficulties, a combination of one or more difficulties, and difficulties in all areas.

Conclusion

In line with previous findings, children with DCD can present with a variety of difficulties. However, depending on which outcomes are added to the model, different profiles are revealed, further emphasizing that DCD has many faces.

Learning Challenges, Movement Challenges: Motor Deficits in Special Education

Authors:

Dorothee Jelsma, University of Groningen, Developmental and Clinical Neuropsychology, Groningen, The Netherlands

Introduction

This study explores motor behavior in children in special education who have average IQs but experience specific learning difficulties. It is known that many children with specific learning disorders struggle with motor tasks. However, less is known about their motor skill-related fitness (motor skills, power and agility). Therefore, children in regular and special education were compared using the Performance and Fitness Test (PERF-FIT), a newly developed tool to measure motor skill-related fitness.

Methods & Results

A random sample of children aged 7–12 years from special education ($n = 125$; mean age = 9.72 ± 1.3) and regular education ($n = 400$; mean age = 9.58 ± 1.4) completed the PERFFIT. PERF-FIT scale scores have a mean of 10 and SD of 3. Children were matched for age and sex. Significant group differences were found in overall test performance (mean total scale score: regular education = 9.73 (SD 3.99); special education = 5.89 (SD 4.17), $p < 0.001$). Items with the largest differences

included: stepping ladder ($d = 1.17$), side jump ($d = 0.98$), ball bounce ($d = 1.06$), ladder running ($d = 0.76$), and throw and catch ($d = 0.74$). In contrast, power-related items (upper and lower extremity) showed no significant differences between groups.

Conclusion

Children in special education do not appear to lack muscular power but struggle with tasks requiring precision, planning, object control, and inhibitory control. These deficits—particularly in tasks involving controlled stepping and automatized postural adjustments—may hinder participation in sports and peer play. The findings highlight the need for targeted motor interventions to support inclusion and engagement in physical activities.

An abstract background featuring a large, stylized orange geometric pattern. The pattern consists of several thick, rounded lines that intersect to form a central star-like shape with six points. The lines have a slight gradient and rounded ends, creating a modern, architectural feel. The overall color palette is warm, dominated by various shades of orange and peach against a white background.

Verbal Session 2 -

Assessment

Clinical profile of children with Developmental Coordination Disorder in Hong Kong

Authors:

Dr Tang May Ling, Child Assessment Service, HKSAR Mr. Wu Man Fai, Child Assessment Service, HKSAR

Background

Developmental Coordination Disorder (DCD) is a prevalent motor skill disorder that significantly impacts children's daily activities and academic performance. This study aims to profile children diagnosed with DCD at Child Assessment Service (CAS) of Department of Health in Hong Kong Special Administrative Region, providing insights into their characteristics and associated challenges.

Methods

A cross-sectional analysis was conducted from January 2022 to December 2024 involving 412 children aged 6 to 12 years who received a DCD diagnosis in CAS. Standardized assessment tools, including the Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2) and Fine Motor Test for the School-aged (FMTS), were utilized to evaluate their motor skills and identify accompanying difficulties. Data were collected regarding demographic information, motor skill performance, and the presence of comorbid conditions.

Results

The findings revealed that around 75% of the children exhibited considerable difficulties in fine motor skills, while 30% demonstrated challenges in gross motor coordination. Additionally, a higher prevalence was noted in boys compared to girls, and comorbid conditions such as Attention-Deficit/Hyperactivity Disorder (ADHD) were common among the participants.

Conclusion

These results highlight the critical need for early identification and targeted interventions for children with DCD. Understanding the specific challenges faced by these children can inform clinical practices and improve outcomes. The study emphasizes the importance of comprehensive assessment and support systems in addressing the multifaceted needs of children with DCD. Future research should focus on long-term outcomes and the effectiveness of various therapeutic strategies to better assist this population.

PERF-FIT Travels to Europe: Risks of using norm-referenced motor tests without cultural adaptation

Authors:

Bouwien Smits-Engelsman, 1 Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Wendy Aertssen, 2 Habeo+, University for Professionals, Breda, The Netherlands.

Dorothee Jelsma, 3 Clinical and Developmental Neuropsychology, University of Groningen, Groningen, The Netherlands.

Introduction

Motor development assessments play a critical role in identifying children at risk for developmental coordination disorder and other motor delays. Historically, children in African countries have been assessed using motor tests developed and normed in Western contexts. These tests often include tasks that reflect motor experiences and educational practices of children in Europe or North America, which may differ significantly from African settings. As a result, many African children have been misclassified as having motor impairments, not due to actual deficits, but because they lack exposure to the specific motor tasks embedded in these assessments. Recently the first motor test became available with established age and sex-based normative data for African children. The question to be answered in this study is “How would Western children score based on norms for African children?”.

Method

In a novel reversal of the typical cross-cultural testing paradigm, this study applied the Performance and Fitness Test (PERF-FIT) to a sample of 603 European children.

Results

The Agility and Power subscale showed a comparable percentage of children in normal, at risk and impaired range (85.1, 10.4, and 4.5%). However, a substantial proportion of the children were classified as impaired on the Motor skill subscale when evaluated against African norms (normal 57.4, at risk 15.7, and impaired range 26.9%). For instance, the mean scale score for boys (n=335) was 7 for static and dynamic balance (instead of 10), while they were above average on agility ladder items (11 and 12.5). Interestingly, Dutch girls (n=296) performed significantly better on Motor skill items (4 of the 5 items) than boys.

Conclusion

A significant proportion of the children would be classified as impaired using African norms. Finding underscore the central argument of this paper: norm-referenced motor tests must be culturally adapted to avoid misclassification and ensure valid assessment outcomes.

Using the DASH-2 to understand handwriting difficulties in DCD and dyslexia

Authors:

Anna L. Barnett, Oxford Brookes University

Sheila E. Henderson, Retired UCL Institute of Education

Introduction

Handwriting is still required in education and many workplace settings. Although motor control is essential to produce words correctly on the page, handwriting is not just a motor skill. Depending on the task, it can also involve generating ideas, formulating sentences, and remembering spellings. It is hardly surprising, therefore, that handwriting difficulties have been reported in various developmental disorders. As they are rarely studied together, the aim of this study was to use the Detailed Assessment of the Speed of Handwriting (2nd Edition; DASH-2) to explore aspects of competence across two diagnostic groups: DCD and dyslexia, to determine any similarities and differences between them.

Method

There were 73 participants (aged 8-25 years) across two diagnostic groups DCD (n= 33) and dyslexia (n=40), each with a matched control group. All were individually tested on DASH-2

comprising four 'core' handwriting tasks: Copying (in Best and Fast modes), Alphabet Writing and Free Writing on a set topic plus a task with no language component assessing the speed and accuracy of pen control (Graphic Speed). A range of variables indicating speed and legibility were recorded.

Results

Overall, both groups performed more poorly on DASH-2 than their control group. Importantly, there were some differences in profile between the groups across tasks. For example, whereas the DCD group had significantly lower scores than controls on all tasks, the dyslexia group had significantly lower scores on the four tasks with a language component but not on the Graphic Speed task.

Conclusion

Handwriting is a challenge for children across various developmental disorders and many will need support to avoid

under achievement and help them progress in education and employment. DASH-2 is sensitive to handwriting difficulties both within and between different clinical groups and is a useful tool for pinpointing areas of difficulty to help plan appropriate support and intervention.

Differential Motor Assessment Outcomes on the MABC-3 and BOT-3 Among Neurodivergent and Neurotypical Children

Authors:

Crystal E. Alvarez, MS, University of Texas at Arlington

Introduction

Motor coordination challenges are well documented in both Autism Spectrum Disorder (ASD) and Developmental Coordination Disorder (DCD), yet inconsistencies across assessment tools may influence how these difficulties are identified in clinical and research contexts. This study compared performance outcomes on the newly released editions of two widely used motor assessments: the Movement Assessment Battery for Children - Third Edition (MABC-3) and the Bruininks-Oseretsky Test of Motor Proficiency- Third Edition (BOT-3).

Method

72 children (50 male, 22 female; ages 5-18 years) participated: 24 autistic (Mage = 10.1 +/- 3.4), 22 with DCD (Mage = 9.2 +/- 3.4), and 26 neurotypical (NT) controls (Mage = 10.2 +/- 2.9). All participants completed both assessments in a counterbalanced order. The MABC-3 evaluates manual dexterity, aiming and catching, and balance/locomotion, while the BOT-3 measures

fine manual control, manual coordination, body coordination, and strength/agility. Percentile ranks were compared, with scores <16th percentile (MABC-3) and <18th percentile (BOT-3) indicating clinically significant motor difficulty.

Results

Mixed-model analyses revealed significant differences between the groups ($p < .001$), with the NT group scoring higher than both neurodivergent groups. Percentile scores were significantly higher on the BOT-3 than in the MABC-3 ($p < .05$). The BOT-3 failed to classify several children identified as at risk by the MABC-3 (ASD = 7; DCD = 7).

Discussion/Conclusion

Findings suggest that the BOT-3 fails to identify several children that were identified as at risk by the MABC-3, which is concerning particularly among neurodivergent populations. The observed discrepancies between instruments underscore the importance of assessment choice in both research and clinical

practice, as test-specific characteristics can impact diagnostic validity to access services. Funding: Pearson Assessments

Unpacking Postural Control: Comparing Balance Items Across PERF-FIT, KTK, and Kids-BESTest-2 in CommunityBased School-Aged children

Authors:

Evi Verbecque, Rehabilitation Research Centre (REVAL), Faculty of Rehabilitation Sciences, Hasselt University, Diepenbeek, Belgium

Paula Rodrigues, Insight: Piaget Research Center for Ecological Human Development, Superior School of Sports and Education, Institute Polytechnic Jean Piaget North, Portugal

Bouwien Smits-Engelsman, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Introduction

Postural control is often treated as a singular construct in motor development assessments. Research increasingly recognizes its multi-mechanistic nature, influenced by task demands and environmental context. This study compares children's performance across a range of items from three different test batteries: the Performance and Fitness test battery (PERF-FIT), the Körperkoordinationstest für Kinder (KTK) and the Kids-BESTest-2. These tools emphasize different mechanisms and task complexity. By examining associations between score patterns, we explored whether these items measured overlapping or distinct aspects of postural control.

Participants and methods

Data from three studies were combined, including 214 Portuguese children (53.1% typical motor development (TMD)),

106 Dutch (61.3% TMD) and 63 Belgian (73.0% TMD). All children were aged 5 to 12 years and were crosssectionally drawn from local regular schools; 51.2% were male. All children performed the PERF-FIT static and dynamic balance subscales. Portuguese/Dutch children also performed the KTK (dynamic balance) and Belgian children performed the Kids-BESTest-2 (6 postural control domains). Spearman correlation coefficients (ρ) were calculated using the raw (total) scores and interpreted as high (≥ 0.75), moderate ($0.5 - < 0.75$), low ($0.25 - < 0.5$) or negligible (< 0.25).

Results

A moderate significant correlation was found between PERF-FIT static and dynamic balance subscales ($\rho = 0.62 - 0.67$). Low to moderate correlations characterized the relationship between KTK items and PERF-FIT static balance ($\rho = 0.30 - 0.62$), and

PERFFIT dynamic balance ($\rho = 0.46 - 0.68$) and across KTK items ($\rho = 0.40 - 0.75$). Low correlations were found between: PERF-FIT static balance and Kids-BESTest-2 'anticipatory postural adjustments (APA)' ($\rho = 0.36$), and between PERF-FIT dynamic balance and Kids-BESTest-2 'APA', 'reactive postural responses (RPA)', 'sensory orientation' and the total score ($\rho = 0.26 - 0.32$). Other correlations across Kids-BESTest-2 domains were low to insignificant.

Conclusion

Although all measures aim to assess dynamic balance, they address different aspects. This underlines the multi-mechanistic nature of postural control and the need to acknowledge its task-specificity, complexity and comprehensiveness in assessment.

Collaborative Development of an Autism-Friendly Toolkit for Administering the MABC-3 Test

Authors:

Priscila Tamplain, University of Texas at Arlington

Miri Tal-Saban, The Hebrew University of Jerusalem

Haylie L. Miller, University of Michigan

Stefania Zoia, University of Padova

Anna Barnett, Oxford Brookes University

Sheila Henderson

Introduction

Early identification of motor challenges is particularly critical for autistic individuals, whose motor difficulties are frequently overlooked. Using multiple assessment instruments provides a comprehensive understanding of how these difficulties manifest in both structured assessment settings and everyday life. However, standard MABC-3 administration can be challenging when sensory sensitivities, communication differences, difficulty interpreting implicit concepts such as “time” and “speed,” or anxiety interfere with performance. This underscores the need for an autism-friendly adaptation of the MABC-3—a tailored toolkit that promotes inclusive, accurate, and respectful assessment practices. In this presentation, we will outline the development process of the toolkit, which was carried out in collaboration with professionals from various disciplines and countries and describe the key recommendations that emerged.

Methods

Six experts in the Movement Assessment Battery for Children – 3rd edition (MABC-3), including the instrument’s authors, collaborated to develop a customized toolkit to support its use with autistic individuals. After the initial draft was created, four experts reviewed and revised the recommendations. Subsequently, two members of the autism community provided feedback, and a final version of the document was produced. Plans for future research and clinical applications are underway.

Results

Five categories of support were identified: Pre-Assessment Preparation, Sensory Support Needs, Procedural Adaptations, Communication & Instruction Adaptations, and Motivation & Engagement Strategies. Each category includes four components—Accommodation, Purpose, Strategy, and

Implementation Example—presented in a table format to enhance clarity and usability.

Discussion/Conclusion

This document presents a series of possible accommodations to support the effective administration of the MABC-3 with autistic individuals. Through collaboration among experts and the autism community, the structured format facilitates the identification and application of strategies that promote accessible, equitable, and effective assessment experiences. Future efforts will focus on disseminating the toolkit and examining its impact in research and clinical contexts.

Assessing Activities of Daily Living in Children Aged 5–10 Years: Rasch Validation of the DCDDaily-Q-CN in Community Contexts

Authors:

Shuo Sun, Department of Rehabilitation Medicine, Shenzhen Children's Hospital

Background

Developmental Coordination Disorder (DCD) affects 5%–6% of school-aged children, impairing motor coordination, daily functioning, and academic performance. Existing assessment tools often focus on either motor skills or functional interference, limiting comprehensive evaluation. This study applied Rasch analysis to the Chinese version of the DCDDaily-Questionnaire (DCDDaily-Q-CN), a parent-report measure of children's daily functioning and participation, to evaluate its measurement properties and crossgender invariance, thereby supporting its validity as a screening tool for children with suspected DCD.

Methods

Rasch analysis was conducted on data from 1,908 typically developing children (1,020 boys and 888 girls; mean age = 7.7 ± 1.7 years) recruited from 14 mainstream schools in a migrant city. The analysis evaluated key psychometric properties,

including item and person reliability and separation, item-person targeting, item fit, category functioning, dimensionality, and Differential Item Functioning (DIF).

Results

Rasch analysis demonstrated excellent item reliability (≥ 0.98) and strong structural validity across all domains. However, person reliability was moderate (0.49–0.75), indicating limited precision in distinguishing individuals within subdomains. The scale showed good item fit (infit and outfit MNSQ values between 0.50 and 1.70), appropriate functioning of response categories, and supported unidimensionality across all domains. Item difficulties were generally well aligned with the ability levels of most children aged 5 to 10 years, confirming that the scale is appropriately targeted for its intended screening purpose. Nevertheless, Wright maps revealed mild ceiling effects and

a degree of mismatch between item difficulty and participant ability, particularly in self-care tasks. DIF analysis identified gender-related bias in several self-care and fine motor items, whereas gross motor items exhibited measurement invariance across gender.

Conclusion

Rasch analysis confirms that the DCDDaily-Q-CN is a psychometrically robust tool with high reliability, unidimensional structure, and generally appropriate item targeting for assessing ADL in children aged 5 to 10 years.

What do teachers really know about DCD? Development of the DCD-TKS (teacher knowledge scale)

Authors:

Jacqueline Williams, Institute for Health and Sport, Victoria University, Melbourne

Melissa Licari, The Kids Research Institute, Australia

Kate Wilmot, Oxford Brookes University, United Kingdom

John Cairney, University of Queensland, Australia

Brett Vaughan, University of Melbourne, Australia

Introduction

Teacher understanding of Developmental Coordination Disorder (DCD) is often reported as low and the need for professional development specific to DCD is highlighted. However, there is currently no validated measure to assess teacher knowledge. This study aimed to develop the DCD-Teacher Knowledge Scale (DCD-TKS), a measure providing statements about DCD to which teachers will respond to using true, false, or do not know options.

Methods

Ten domains of expertise pertaining to DCD of relevance to education were identified (e.g. hand-writing, executive function, physical education, comorbidity) and experts in each domain were approached to participate in development of the questionnaire. This formed an expert panel of ten internationally

recognized experts in fields of DCD. Each expert submitted up to ten statements for the questionnaire (including both true and false items). These were compiled and the experts participated in a Delphi process, voting on whether each item should be included. Where consensus about inclusion or exclusion of an item was reached, it was actioned appropriately and dropped from the subsequent round of voting. Once a final list of statements was produced, it was reviewed for clarity by the expert panel, as well as a group of ten current Australian teachers and ten parents of children with DCD, who reviewed the relevance and clarity of each statement.

Results

Voting was completed in 3 rounds. The final questionnaire consists of 32 statements to which teachers will be required to respond to with a Yes, No or Don't Know. All statements were

successfully reviewed by both teachers and parents, with no changes required.

Discussion

The DCD-TKS will enable quantifiable assessment of teacher knowledge of DCD and act as a tool to evaluate the impact of teacher training programs globally. The scale is now ready for evaluation in terms of reliability and validity.

An abstract background featuring a large, stylized orange geometric pattern. The pattern consists of several thick, rounded lines that intersect to form a central star-like shape with six points. The lines have a slight gradient and rounded ends, creating a modern, architectural feel. The pattern is set against a white background.

Verbal Session 3 -

Early Identification

Diagnosis and management of children with Developmental Coordination Disorder in Hong Kong

Authors:

CHUI Mun Yee, Child Assessment Service, HKSAR

Developmental Coordination Disorder (DCD) is a prevalent condition that significantly impacts motor skills and coordination in children, affecting their daily functioning, academic performance, and social interactions. Notably, DCD is one of the most common clinical conditions referred to the Child Assessment Service (CAS) among school-aged clients.

This presentation shares insights from local experiences in the diagnosis and management of children with DCD within CAS, which operates as a multidisciplinary team. By following the International Classification of Functioning, Disability and Health (ICF) model, a holistic understanding of each child's unique challenges is achieved by emphasizing the interaction among health conditions, functional abilities, and environmental factors. The following areas will be discussed: the application of standardized assessment tools for diagnosis of DCD, the use of evidence-based intervention approaches, and the training workshops to empower parents.

Given Hong Kong's high academic demands, school and public examination accommodations are essential to support learning. Enhancing participation and overall well-being requires collaboration with other parties, such as the Education Bureau for school-related issues and the Leisure and Cultural Services Department for leisure activities in community.

We strive to foster a more inclusive environment for children with DCD, ultimately improving their quality of life and enabling them to thrive at home, in school, and within the community.

Association of developmental coordination disorder with early-life ecological environments in preschoolers: nationwide exposome evidence from 551 Chinese cities

Authors:

Yongzhou Liang, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

Haizhen You, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

Huizhen Li, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

Hao Pan, Department of Mathematics, Shanghai Normal University, 100 Guilin Rd, Shanghai, 200234, China.

Jing Hua, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China.

Background

Early-life exposure to multidimensional ecological environments is a plausible risk factor for developmental coordination disorder (DCD); however, evidence from systematic, population-based studies remains limited. We aimed to assess the association between a broad spectrum of outdoor environmental exposures and DCD risk in a nationwide cohort of Chinese preschoolers.

Methods

In this retrospective cohort study, we included 80,859 children aged 3–5 years from the Chinese National Cohort for Motor Development (2018–2019). In accordance with the conceptual framework of the DSM-5, we adopted a multidisciplinary approach to the diagnosis of DCD. We evaluated 19 outdoor

environmental exposures during pregnancy and the first 36 months after birth, covering five domains: points of interest (POI), natural spaces, built and road environments, air pollution, and meteorology. Exposome-wide association study (ExWAS) and clustering analysis were conducted to identify single-exposure associations and ecological patterns, respectively. Critical susceptibility windows were also determined.

Results

The mean age of the cohort was 4.05 (SD 0.88) years, comprising 42,744 (52.9%) boys and 38,115 (47.1%) girls. The prevalence of suspected DCD was 8.1%. In ExWAS, better motor performance (indicated by higher LDCDQ scores) was associated with lower exposure to forest cover, temperature, humidity, rainfall, and NDVI, and with higher exposure to specific air pollutants

(e.g., SO₂), road density, and grasslands. Cluster analysis identified four distinct ecological patterns with significant spatial heterogeneity: “Livable Environment,” “Infrastructure-Dense Urban Environment,” “Green Storm Environment,” and “Polluted Grassland Environment.” These ecological patterns were significantly associated with DCD risk, with heightened susceptibility to the “Infrastructure-Dense Urban Environment” during pregnancy (OR 1.13, 95% CI 1.05–1.22) and to the “Green Storm Environment” from birth to 36 months (OR 1.18, 95% CI 1.09–1.28).

Conclusion

Adverse outdoor environmental exposures are associated with an increased risk of DCD beginning in the fetal stage onwards, with effects varying across spatial and temporal dimensions.

Association of Maternal Pre-pregnancy Body Mass Index With Suspected Developmental Coordination Disorder in Preschool Children: A National Cohort Study

Authors:

Huijuan Peng, Department of Maternal and Child Health, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China

Guixia Chen, Department of Children Healthcare, Women and Children's Hospital, School of Medicine, Xiamen University, Fujian, China

Jing Hua, Department of Maternal and Child Health, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai 200092, China

Introduction

Maternal pre-pregnancy obesity is a known risk factor for neurodevelopmental delays, but its specific association with Developmental Coordination Disorder (DCD) remains insufficiently understood. This study aimed to investigate the association between maternal pre-pregnancy BMI and the risk of suspected DCD in Chinese preschool children.

Methods

We performed a secondary analysis of a large-scale national retrospective cohort conducted in China (2018-2019). The study included 137,269 mother-child pairs (children aged 3-5 years). Maternal pre-pregnancy BMI was calculated from self-reported weight/height and categorized as underweight, normal, overweight, or obese based on Chinese standards. Suspected DCD was assessed using the Chinese version of the

Little Developmental Coordination Disorder Questionnaire (LDLCDQ), defined as a total score ≤ 15 th percentile. Multilevel logistic regression and linear mixed models were used to analyze associations, adjusting for sociodemographic factors.

Results

Compared with the normal-weight group, maternal pre-pregnancy overweight ($\beta = -0.64$; 95% CI: -0.79 to -0.48) and obesity ($\beta = -0.96$; 95% CI: -1.20 to -0.70) were significantly associated with lower LCDQ total scores, whereas underweight was associated with higher scores ($\beta = 0.21$; 95% CI: 0.09-0.32) when adjusting for other covariates. Similar trends were observed across LCDQ subscales. Additionally, maternal pre-pregnancy overweight (adjusted OR=1.15; 95% CI: 1.09-1.20) and obesity (adjusted OR=1.22; 95% CI: 1.13-1.32) were both significantly associated with an increased risk of suspected

DCD in offspring. Conversely, pre-pregnancy underweight was associated with a reduced risk (adjusted OR=0.95; 95% CI: 0.91-0.99).

Conclusion

Maternal pre-pregnancy overweight and obesity are significantly associated with an increased risk of suspected DCD in early childhood, highlighting the importance of weight management during the preconception period. Targeted early screening and developmental monitoring may benefit children born to mothers with high pre-pregnancy BMI.

Predicting later motor status from early DCD severity: a twotimepoint longitudinal study

Authors:

Reza Abdollahipour, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Ludvík Valtr, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Kamila Banátová, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Lucia Bizovská, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Tomáš Klein, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Zdeněk Svoboda, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Peter H. Wilson, Healthy Brain and Mind Research Centre, School of Behavioural and Health Sciences, Faculty of Health Sciences, Australian Catholic University, Melbourne, VIC, Australia

Introduction

Developmental Coordination Disorder (DCD) is characterized by significant motor coordination difficulties that affect daily functioning. Although DCD is often considered a persistent neurodevelopmental condition, the stability of motor impairment across time remains insufficiently understood. The aim of this study was to examine whether initial DCD severity predicts later motor status by evaluating longitudinal changes in motor classification from childhood.

Methods

At Time 1 (T1), 68 children with DCD meeting DSM-5 criteria were classified using standardized MABC-2 scores into mild (m-DCD) or severe DCD (s-DCD). At Time 2 (T2), all children completed the MABC-2 and DCDQ and were reclassified into

five groups: typically developing children (TDC), TDC with motor concerns (MABC-2 $\leq$ 16th percentile, DCDQ $>$ 16th), TDC with functional concerns (MABC-2 $>$ 16th, DCDQ $\leq$ 16th), or DCD (mild or severe). Cross-tabulation described T1–T2 transitions, Phi and Cramer's V assessed association strength, and Cohen's Kappa evaluated classification agreement.

Results

Cross-tabulation of T1 and T2 classifications revealed notable patterns of stability and transition. Among children classified as m-DCD at T1 ($n = 42$), 23.8% transitioned to the TDC group at T2, 9.5% to TDC with motor concerns, 28.6% to TDC with functional concerns, 26.2% remained as m-DCD, and 11.9% progressed to s-DCD. Children classified as s-DCD at T1 ($n = 26$) showed greater stability, with 46.2% remaining in s-DCD

and 26.9% classified as m-DCD at T2. Smaller proportions of s-DCD children transitioned to TDC with functional concerns (15.4%) or TDC with motor concerns (11.5%), and none moved into the TDC category.

Discussion/Conclusion

Findings indicated that baseline severity predicts later status, but classifications are not fully stable; children with m-DCD show more fluctuation, whereas those with s-DCD generally remain within the DCD group, highlighting the need for ongoing monitoring and support.

Funding: This research was supported by the Czech Science Foundation [GAČR 26-23458S; 21-15728X].

Risk factors for developmental coordination disorder: Results from a systematic review

Authors:

Jill G. Zwicker, Department of Occupational Science & Occupational Therapy, University of British Columbia and BC Children's Hospital Research Institute, Vancouver, CA

Reza Abdollahipour, Faculty of Physical Culture, Palacký University, Olomouc, CZ

Frederik Deconinck, Department of Movement and Sports Sciences, Ghent University, Ghent, BE

Ian Fuelscher, School of Psychology, Deakin University, Melbourne, AUS

Bouwien Smits-Engelsman, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, SA

Sabine Vincon, Division of Occupational Therapy and Arts Therapies, Queen Margaret University, Edinburgh, UK and Clinic for Child Neurology and Social Paediatrics, Child Centre Maulbronn, DE

Introduction

Affecting one in 20 children, Developmental Coordination Disorder (DCD) is a common neurodevelopmental disorder characterised by impaired motor coordination and motor learning that significantly affects the ability to perform activities of daily living. While we don't know what causes DCD, several risk factors have been associated with DCD.

Methods

As part of the update to international clinical practice guidelines, our group conducted a systematic review of the literature to examine mechanisms underlying DCD. We searched five databases (MEDLINE, Embase, CINAHL, PsycINFO and Web of Science) and imported references into Covidence. After duplicates were removed, two independent reviewers screened

5379 articles. A total of 656 articles met our inclusion and exclusion criteria. Of these, 71 articles examined prenatal, perinatal, social, and environmental risk factors associated with DCD.

Results

We are in the process of extracting data and evaluating the quality of evidence of included studies. Studies have been conducted around the world, including Australia, Brazil, Canada, China, Denmark, Italy, and the United Kingdom. While the majority of evidence highlights the higher risk of DCD in children who are born preterm, other risk factors that may be related to DCD include parental infertility, maternal age, maternal exposure to substances (e.g., tobacco smoke, antidepressants, methadone), maternal health (e.g., fever,

preeclampsia), birth-related events (e.g., threatened abortion, fetal distress during labour), and socioeconomic status. Cumulative prenatal factors likely pose a greater risk of DCD.

Conclusion

The identification of early risk factors is critical to determine the infants and children who may be at higher risk of DCD so that early intervention can be initiated. Some risk factors may be modifiable, which may prevent DCD or lessen the prevalence of the disorder.

Parent perspectives on early diagnosis of DCD: Implications for future care pathways

Authors:

Olivia Tsihlias, University of British Columbia

Jill G. Zwicker, University of British Columbia

Background

Many parents of children with Developmental Coordination Disorder (DCD) recognize motor difficulties at an early age, yet most children are not identified until schoolage (if at all). Delayed diagnosis misses a critical window for intervention, hindering development as motor skill deficits disrupt daily life. There is a need to consolidate and amplify parents' perspectives on the journey of navigating a DCD diagnosis to inform strategies that improve access to effective care pathways for children with/at risk of DCD.

Purpose

To explore the experiences of parents of children with DCD in order to identify barriers and facilitators to achieving an earlier diagnosis.

Methods

Parents of children with a formal DCD diagnosis were recruited from a DCD database. Semi-structured interviews were conducted via Zoom and analyzed using NVivo15 Software. Transcripts were deductively coded using the Theoretical Domains Framework (TDF) to identify barriers and facilitators, followed by inductive coding of emerging subthemes.

Findings

Ten parent interviews have been conducted to date. Preliminary findings identified the TDF domains of "Knowledge" and "Environmental Context and Resources" as key gaps that delayed the identification of DCD. Main barrier sub-themes included a lack of awareness of DCD, difficulty navigating care pathways, inconsistent developmental followup, and lack of access to resources. Central facilitators from the TDF domains were "Beliefs About Consequences" and "Social/Professional Role and

Identity". Primary facilitator subthemes included the impact on development, diagnosis as a gateway to appropriate supports, strong parental advocacy roles, and adapting one's parenting lens.

Conclusion

Interviews provided meaningful insights into the barriers and facilitators parents encounter when accessing a diagnosis of DCD and understanding next steps. Findings will help inform strategies to improve timely access to diagnostic supports, as well as the planning and evaluation of implementation initiatives to strengthen care pathways for children with/at risk of DCD and their families.

An abstract background featuring a large, stylized orange geometric pattern. The pattern consists of several thick, rounded lines that intersect to form a central star-like shape with six points. The lines have a slight gradient and rounded ends, creating a modern, architectural feel. The pattern is set against a white background.

Verbal Session 4 - Intervention

Early intervention approaches for children with/at risk of Developmental Coordination Disorder: An updated scoping review of recent research

Authors:

Olivia Tsihlias, University of British Columbia

Erin Klein, University of British Columbia

Jill G. Zwicker, University of British Columbia

Introduction

Developmental Coordination Disorder (DCD) is often not recognized until school age, despite symptoms appearing early in childhood. Early intervention is pivotal to improving developmental trajectories and reducing secondary psychosocial consequences for children with/at-risk of DCD. Although much of the literature explores therapeutic interventions for school-aged children with DCD, a previous scoping review (Zwicker & Lee, 2021) summarized the evidence for early intervention in children with/at risk of DCD. Given the growing recognition and need for support before formal school entry, an updated literature review is warranted to explore emerging intervention approaches.

Purpose

To provide an updated summary of recent studies for early motor-based intervention for children (<6 years of age) with/at risk of DCD.

Methods

A comprehensive search was conducted across five databases: MEDLINE, CINAHL, Embase, PsycINFO, and ERIC. Two independent reviewers screened abstracts and full-texts using Covidence. Studies were included if they were: (1) published after January 2018; (2) used DCD or similar terms (i.e., dyspraxia); (3) included children between the ages of 3 and 6 years; (4) indicated early identification or the use of validated DCD-related assessments; and (5) included a motor-based intervention.

Results

Of the 4062 articles screened, 12 met our inclusion criteria, encompassing nine interventions (Body function/structure-oriented: n=6; participation-oriented: n=1; both: n=2) with mixed modes of delivery. Most studies were of low-level evidence (Levels II-IV), with two meeting Level 1 criteria. Directly after interventions, all studies displayed some degree of

improvement for children with/at risk of DCD. All studies with follow-ups (n=5) reported sustained motor-/functional-related improvement.

Interpretation

Findings are promising for providing early intervention for children with/at risk of DCD. Several studies build on previous interventions helping to validate and strengthen the existing knowledge base and inform best practice. Further investigation is needed to build capacity and effectively integrate evidence-based practices into standard of care.

Grey matter volume changes after CO-OP intervention in children with co-occurring autism spectrum disorder and developmental coordination disorder

Authors:

Sarah F. Tischer, University of British Columbia

Alexander M. Weber, University of British Columbia

Jill G. Zwicker, University of British Columbia

Introduction

Up to 88% of children with autism spectrum disorder (ASD) have cooccurring developmental coordination disorder (DCD), which affects the acquisition of everyday motor skills (e.g., tying shoelaces, printing). An effective intervention for DCD is Cognitive Orientation to daily Occupational Performance (CO-OP) that utilizes cognitive skills to achieve motor abilities. Our lab previously showed that CO-OP can improve motor skills and induce positive changes in white matter pathways and functional connectivity in children with both ASD+DCD. We would now like to: (1) compare cerebral and cerebellar grey matter volumes (GMV) pre- and post-CO-OP intervention in children with ASD+DCD; and (2) examine the relationship of these brain changes and motor improvement.

Methods

In this quasi-experimental study, 24 children [19 male; 5 female; mean (SD) age: 10.2 (1.51) years] diagnosed with ASD and meeting diagnostic criteria for DCD completed motor assessments and MRI scans pre- and post-10-week CO-OP intervention (1h per week). Cerebral whole-brain data and cerebellar region of interest voxel-based morphometry will be conducted on high quality scans to determine GMV using the pipelines CAT12 (cerebrum) and SUIT (cerebellum). Pre- and post-intervention motor scores and cerebral and cerebellar GMV will be compared using repeated measures ANCOVA with covariates age, sex, and total intracranial volume for GMV comparisons. The relationship between GMV changes in the cerebrum/cerebellum and clinically meaningful motor skill improvements will be examined by partial Spearman correlation, controlling for age, sex, and total intracranial volume, and adjusting for multiple comparisons.

Results

Data analysis is ongoing. We anticipate that GMV will decrease in the cerebrum and increase in the cerebellum, indicating greater brain maturation with intervention.

Conclusion

Anticipated findings will advance our understanding of neuroplastic changes associated with CO-OP intervention, which may further support advocacy efforts to include CO-OP intervention as a future standard of care for children with ASD+DCD.

School-based Motor Skill Interventions for Children and Adolescents with Developmental Coordination Disorder: A Systematic Review and Meta-Analysis

Authors:

Anni Pohjanvirta, Faculty of Sport and Health Sciences; University of Jyväskylä, Finland

Tanja Pöyliö, Faculty of Sport and Health Sciences; University of Jyväskylä, Finland

Katie Robinson, Centre for Active Living and Learning, College of Human and Social Futures, University of Newcastle, Callaghan, NSW, Australia; Hunter Medical Research Institute (HMRI), New Lambton, NSW, Australia

Piritta Asunta, School of Health and Social Studies, Likes, JAMK University of Applied Sciences, Jyväskylä, Finland

Terhi Huovinen, Faculty of Sport and Health Sciences; University of Jyväskylä, Finland

David Revalds Lubans, Centre for Active Living and Learning, College of Human and Social Futures, University of Newcastle, Callaghan, NSW, Australia; Hunter Medical Research Institute (HMRI), New Lambton, NSW, Australia

Timo Jaakkola, Faculty of Sport and Health Sciences; University of Jyväskylä, Finland

Introduction

Our systematic review and meta-analysis aimed to investigate the effects of school-based interventions on motor performance in children and adolescents with Developmental Coordination Disorder (DCD) and to explore potential moderators of effects. No previous meta-analysis has focused exclusively on school-based interventions targeting motor skill development in children with DCD.

Methods

A systematic search of seven databases (PubMed, Web of Science, SCOPUS, SPORTDiscus, ERIC, PsychINFO, CINAHL, and Google Scholar) was done in August 2024. An update search

was completed in August 2025. Studies were included in the review if they included school-aged children or adolescents (5-19 years) with DCD or probable DCD (pDCD), were conducted in school settings, included motor skill training, and assessed motor performance. Studies with a DCD/pDCD non-training control group were eligible for further meta-analysis. Meta-analysis was made using metaSEM and metafor packages in R software.

Results

Altogether 35 studies were included in the systematic review. Of these, 18 studies (with 47 effect sizes) were eligible for meta-analysis. Through meta-analysis a large effect on motor

performance was found (Hedges' $g=1.06$, 95% CI 0.60 to 1.53). Due to significant heterogeneity among studies further moderator analyses were done. Moderator analysis revealed that training frequency of at least three times a week and total dose of at least 500 minutes lead to largest effects. Both teacher- and external facilitator-led interventions were effective in improving motor performance, with teacher-led interventions showing even larger effects.

Conclusions

Our research indicates that school-based motor skill interventions are effective in improving motor performance in school-aged children and adolescents with DCD/pDCD and teachers can effectively facilitate these interventions.

Virtual reality–based interventions on physical abilities in children with developmental coordination disorder: Meta analysis with moderating and meta regression effects

Authors:

Syed Zain Ul Abidin, College of Health Care, China Medical University, Taiwan

Shin-Da Lee, College of Health Care, China Medical University, Taiwan

Yao-Chuen Li, Department of Physical Therapy, China Medical University, Taiwan

Sarina Hui-Lin Chien, Graduate Institute of Biomedical Science, China Medical University, Taiwan

Introduction

Virtual reality (VR)–based interventions offer interactive environments supporting motor relearning and physical activity in children with developmental coordination disorder (DCD). However, their overall effectiveness on physical abilities remains unclear, including the influence of intervention dosage and participant characteristics. Therefore, this meta-analysis evaluated the effects of VR-based interventions on physical abilities in children with DCD and explored potential moderators.

Methods

Only randomized trials were searched from six databases through August 2025. Five studies met inclusion criteria, contributing 24 effect sizes across six motor domains and overall

motor coordination. Standardized mean change coefficient (SMCC) was calculated, and random-effects models were applied with heterogeneity being assessed using I^2 . Moderation analysis examined categorical variables (i.e., session frequency, intervention duration, age group, and motor domains), while meta-regression assessed continuous variables (i.e., frequency per week, total intervention duration, and mean age).

Results

A small, non-significant pooled effect of VR-based interventions were observed on overall motor coordination with substantial heterogeneity (SMCC = 0.28, 95% CI [−0.17, 0.73], $p = .221$; $I^2 = 76.3\%$). There was also no significant effect on individual motor domains (all p 's > .05). However, there were significant moderating effects of session frequency, age group, and total

intervention duration (all p 's < .05). Meta-regression validated these categorical differences by quantifying linear trends, revealing that each additional weekly session increased effect size by 0.39 ($p = .017$, $R^2 = .22$), each additional minute of intervention duration decreased effect size by 0.003 ($p = .001$, $R^2 = .41$), and each additional year of age increased effect size by 0.12 ($p = .007$, $R^2 = .34$).

Conclusion

Although VR-based interventions show a limited effect on physical abilities in children with DCD, outcomes may improve with structured implementation. Interventions targeting older children, using shorter durations and higher weekly frequencies, may optimize motor coordination benefits.

eHealth for mental health in DCD: What we have learnt from multiple deliveries of a parent mediated physical activity intervention.

Authors:

Jacqueline Williams, Institute for Health and Sport, Victoria University, Melbourne

Alexandra Parker, Institute for Health and Sport, Victoria University, Melbourne

Priscila Tamplin, The University of Texas at Arlington, USA

Kate Wilmut, Oxford Brookes University, UK

Introduction

At DCD-15, we presented an innovative eHealth program aimed at increasing the mental health of children with Developmental Coordination Disorder (DCD) through physical activity. The eHealth program was delivered over 12 weeks via Facebook to families, educating and empowering them to increase the physical activity levels of their children. Since then, this program has been delivered again to families in both the UK and Australia, with the results and lessons learned to be presented here.

Methods

At the time of submission, an additional 31 families of children (5-11 years) with DCD have participated in this program. An additional cohort will be undertake the program in 2026 prior to the conference. Each family were gifted activity tracking

watches and parents joined a private Facebook group for 12 weeks. Parents were provided with weekly resources, including videos, related to PA, mental health and DCD. Daily steps were extracted from the child and parent Garmin watches to determine efficacy and feasibility was assessed using objective Facebook engagement measures, parent report, and wear time of Garmin trackers.

Results

At the time of submission, data seems to be following a similar trend to previous work, with high levels of Facebook engagement and parent satisfaction with the intervention. Child activity tracker data was valid for 95.5% of intervention weeks. Higher baseline step rates appear to have reduced the number of children with increased step rates during the study at this point in time. Data will be expanded prior to the conference.

Discussion

Preliminary data from this cohort supports the feasibility and efficacy of this program unique program, with the potential for easy replication in other countries and cohorts. While eHealth interventions are cost-effective with wide reach, deliveries of this program in Australia, the UK and USA allows us to share key learnings, limitations outcomes.

Choice-based autonomy support intervention enhances motor competence in children with developmental coordination disorder

Authors:

Miriam Palomo, Universidad Complutense de Madrid

Reza Abdollahipour, Palacky University

Miguel Villa, Universidad Complutense de Madrid

Irene Ramón Otero, Universidad Complutense de Madrid

Ludvik Valtr, Palacky University

Dorothee Jelsma, Groningen University

Background

Children with developmental coordination disorder (DCD) often struggle to develop the motor skills typically expected for their stage of development, resulting in reduced overall motor competence. These difficulties highlight the need for effective interventions. Autonomy-supportive methods that provide simple choices during learning have been shown to enhance engagement and skill development in typically developing children (TDC). However, their impact on children with DCD remains unclear. The aim of this study was to examine the effects of a 12-week autonomy-supported training program, implemented during physical education (PE) lessons, on motor competence in children with DCD.

Methods – Results

A total of 141 children (age range: 14-16 years) participated in this study. Motor competence was assessed for all children

using the Movement Assessment Battery for Children-2. In a randomized controlled trial, both children with TDC and DCD were assigned to either an autonomy-supportive (choice) or a control (no-choice) group, matched for age and gender. All participants completed a 4-week intervention in each of three task domains, including manual dexterity (rope knot), ball skills (throwing and catching medicine balls at a trampoline), and balance (hopscotch), for a total duration of 12 weeks. Each task was performed at three levels of difficulty. Choice-intervention participants could select the order of the three difficulty levels before each session, while no-choice participants were yoked to their counterparts' selections. TDC were included for comparison, but their outcomes were secondary, as their motor competence was already within the typical developmental range. The MABC-2 test percentiles from pre-to post-intervention indicated that children with DCD in the choice group achieved significantly higher motor competence scores compared to those in the no-choice control group.

Conclusions

The findings of this study demonstrated that incorporating choice-based autonomy support is an effective strategy for enhancing motor competence in children with DCD.

Funding

GACR 26-23458-S

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Poster Session 1

Disorder of Attention, Motor Control and Perception in Grade 1 Boys and Girls

Authors:

Monique de Milander, University of the Free State
Robert Schall, University of the Free State
Jason-Paul Buchholz, Independent researcher
Stacey-Lauren Fredericks, Independent researcher
Hebeth Rosanè Jonck, Independent researcher
Leandrei van den Bergh, Independent researcher
Mareli Willemse, Independent researcher

Introduction and Aim

Researchers continue to investigate the predictive validity of motor assessment in learners with disorder of attention, motor control and perception (DAMP). The aim of the study was to determine the prevalence of attention-deficit hyperactive disorder (ADHD) and developmental coordination disorder (DCD); assess their association in Grade 1 children.

Methodology

Two primary schools located within 30 km of the University of the Free State, Bloemfontein. ADD/ADHD was assessed using the strength and weaknesses of ADD/ADHD symptoms normal behaviour rating scale (SWAN) and DCD using the Movement Assessment Battery for Children – 2 (MABC-2).

Results

One-hundred-and-ninety-five children (97 girls; 98 boys) aged 6 to 8 years participated. MABC-2 and SWAN data were available for 195 and 182 children, respectively. Across both genders, 180 participants (92.3%) had no, 10 (5.1%) had moderate and 5 (2.6%) had severe motor difficulties. No statistically significant association ($p = 0.1537$) between gender and DCD was found. Similarly, 31 (17.0%) participants had ADHD subtype ADHD-I, 21 (11.5%) ADHD-H and 11 (6.0%) ADHD-C; no significant associations between gender and ADHD-I ($p = 0.5579$), ADHD-H ($p = 0.4938$) or ADHD-C ($p = 0.7654$) were found. There were no significant associations between DCD and the ADHD subtypes ADHD-I ($p = 0.2956$), ADHD-H ($p = 0.7570$) and ADHD-C ($p = 1.000$).

Conclusion

Prevalence of DCD in the current study is higher than elsewhere in the world. No significant association between DCD and ADHD was found. The relatively high prevalence of DCD in this South African population and its significance in the motor development of young children.

Differences in resilience, hope, and sense of coherence among adolescents with ADHD, DCD, ADHD and DCD, and typical adolescents

Authors:

Miri Tal-Saban, The Hebrew university, School of Occupational Therapy, Jerusalem, Israel

Introduction

Adolescents with neurodevelopmental disorders, such as ADHD and DCD, face daily obstacles. These disorders frequently co-occur, leading to more severe symptoms compared to ADHD or DCD alone. Resilience, hope, and sense of coherence (SOC) are critical factors in promoting positive adaptation and mitigating the challenges associated with these diagnoses. However, studies in this field are limited. Aim: This study examined resilience, hope, and SOC among adolescents with ADHD, DCD, co-occurring ADHD and DCD, and typical adolescents.

Methods

105 adolescents (12-18 years) with ADHD (n=28), DCD (n=9), co-occurring ADHD+DCD (n=23), and typical adolescents (n=45) underwent a comprehensive MABC-2 assessment to confirm their diagnostic status before completing self-report questionnaires on resilience, hope, and SOC.

Results

The co-occurring group reported significantly lower levels of resilience, hope, and SOC compared to typical adolescents ($p=.035$). No significant differences were found between the co-occurrence, ADHD, and DCD groups in all study variables ($p>.05$). Moderate to strong positive correlations were found linking resilience, hope, and SOC, with hope and SOC accounting for the majority of resilience variance ($R^2=44.1\%-55.7\%$).

Conclusion

These findings underscore the distinct challenges faced by adolescents with co-occurring ADHD and DCD, emphasizing the need for specialized interventions that address their unique emotional profile. Recognizing co-occurrence as a distinct clinical profile is crucial for ensuring the integration of emotional factors into both assessment and intervention

frameworks. Furthermore, This study highlights the theoretical connection between resilience, hope, and SOC and their vital roles in resilience development.

Are traits of developmental coordination disorder and autism spectrum disorder associated with physical activity and sedentary behavior in adults?

Authors:

Jorge Cavalcante-Neto, Universidade do Estado da Bahia

Priscila Tamplin, The University of Texas at Arlington

João Silva, Universidade do Estado da Bahia

Sarah da Silva, Universidade do Estado da Bahia

Irla Silva, Universidade do Estado da Bahia

Introduction

Developmental Coordination Disorder (DCD) and Autism Spectrum Disorder (ASD) are neurodevelopmental disorders, interfering in the execution of daily life tasks. While previous literature has highlighted the impact of each disorder on physical activity and sedentary behavior in childhood, studies in adults remain scarce. The objective of this study was to analyze the association between DCD, ASD and combined DCD+ASD traits with levels of physical activity and sedentary behavior in university students, controlling for age and sex.

Methods

A total of 146 university students completed the adult DCD checklist (ADC), Autism Spectrum Quotient (AQ), and the International Physical Activity Questionnaire (IPAQ-short).

Participants were categorized according to standard cut-offs for DCD and ASD traits, while levels of physical activity and sedentary behavior were categorized based on median metabolic equivalents (METs). Binary logistic regression analyses were performed with physical activity and sedentary behavior as dependent variables and DCD, ASD, and DCD+ASD traits as independent variables. Adjusted models were tested, controlling for age and sex. Collinearity diagnostics indicated no issues, suggesting that the independent variables did not compromise coefficient estimation.

Results

Significant associations were observed between DCD traits and sedentary behavior (OR: 2.52; CI: 1.04-6.13; $p = 0.04$), and between ASD traits and levels of physical activity (OR: 3.33;

CI: 1.03-10.72; $p = 0.04$), but no associations were found for combined DCD+ASD traits for either outcome.

Discussion/Conclusion

DCD traits were associated with a 2.52-fold increase in sedentary behavior, whereas ASD traits were associated with a 3.33-fold reduction in physical activity. Although each disorder appears to negatively affect physical activity and sedentary behavior individually, the combined traits showed no effect. The findings suggest that DCD and ASD may have distinct functional implications for physical activity behaviors. The reasons should be explored in future studies.

Tracking sleep in families of children with DCD: What objective data reveal

Authors:

Mary Luz Ocampo-Plazas, 1. University of Texas at Arlington 2. Universidad Nacional de Colombia

Introduction

Sleep is essential for child development and parent functioning, yet limited research has examined sleep in families of children with Developmental Coordination Disorder (DCD). This study used objective measures to examine deep sleep, light sleep, awake time and total sleep hours in children with DCD and their parents during an eight-week eHealth intervention.

Methods

This study was part of a larger project evaluating an eHealth intervention delivered through Facebook. Seventeen children aged 5-11 years with a diagnosis or indication of DCD and one parent participated. Each family received Garmin wristwatches to monitor daily sleep patterns. Devices recorded deep sleep, light sleep, awake time, and total sleep hours across eight weeks. A linear mixed-effects model examined the main effects of group (children vs. parents) and time (Week 0-7), treated as categorical variables. Random effects accounted for individual variability. Analyses were conducted using SPSS version 29 with maximum likelihood estimation.

Results

Children showed significantly higher deep sleep than parents ($p < .001$). Deep sleep also varied across weeks ($p = .004$), reflecting fluctuations and an overall increasing trend. Total sleep hours differed between groups ($p < .001$) and varied weekly ($p < .001$). Light sleep varied by week ($p = .019$) but did not differ between groups. Awake time showed no significant group or weekly differences. Average deep sleep across weeks was 7.0 hours for children and 4.9 hours for parents.

Discussion/Conclusion

Children with DCD and their parents demonstrated distinct and dynamic sleep patterns, with children obtaining more deep sleep and showing increases over time. When compared with National Sleep Foundation recommendations (7-8 hours per night for adults, 11-12 hours for preschool-aged children and at least 10 hours for school-aged children) both groups fell below expected levels. These findings suggest potential sleep insufficiency in families of children with DCD and highlight the importance of

objective monitoring for understanding sleep, health and daily functioning in this population.

Study Protocol of Comparative Effectiveness, Safety and Feasibility of Interventions to Improve Motor Skills in Children with Developmental Coordination Disorder: A Systematic Review and Network Meta-analysis

Authors:

Shine H. Lin, Division of Kinesiology, School of Public Health, LKS Faculty of Medicine, The University of Hong Kong

Whitney W. Au, Division of Kinesiology, School of Public Health, LKS Faculty of Medicine, The University of Hong Kong

Catherine M. Capio, Department of Physiotherapy, School of Nursing and Health Studies, The Hong Kong Metropolitan University

Parco M. Siu, Division of Kinesiology, School of Public Health, LKS Faculty of Medicine, The University of Hong Kong

Introduction

Developmental Coordination Disorder (DCD) is a neurodevelopmental disease affecting one in twenty children. Children diagnosed with DCD often have compromised daily functioning, learning abilities, and mental health, with negative impacts extending into later years of life. Given the current lack of hierarchical comparison of the effectiveness of different interventions on improving their motor skills, the implications of effectiveness to clinicians remain limited. Thus, this systematic review and network meta-analysis investigated the comparative effectiveness, safety, and feasibility of interventions to improve motor skills in children with DCD.

Methods

A systematic search was conducted in PubMed, Web of Science, Embase, ProQuest and Scopus, and reference lists of relevant

reviews without restrictions on language or publication date to identify potential studies. To be included, studies had to be randomized controlled trials that had interventions aimed at improving motor proficiency in children and adolescents with DCD diagnosed by the Diagnostic and Statistical Manual of Mental Disorders 4/5 or ICD-10. The primary outcome was change in motor performance scores measured by standardized tests such as the Movement Assessment Battery for Children (MABC) or MABC-2, or Bruininks-Oseretsky Test of Motor Proficiency (BOT) or BOT-2. Secondary outcomes included changes in sub-domain (e.g., manual dexterity, balance & aiming and catching) measured by standardized tests. Two independent reviewers will screen for eligible studies, perform data extraction on study characteristics, and extract the data required for effect size calculations.

Implication

Our findings will inform intervention approaches that can effectively improve motor skills in children with DCD. This holds particular significance for their overall wellbeing and long-term health. Furthermore, it will provide valuable insights on informing clinical practice for this population with treatment options that can be safely and efficaciously prescribed to DCD children to improve their motor proficiency and health in the long run.

Internalizing problems and heart rate variability in children with developmental coordination disorder

Authors:

Yao-Chuen Li, Department of Physical Therapy, China Medical University, Taiwan

Kuan-Ching Chang, Department of Physical Therapy, China Medical University, Taiwan

Kuan-Wei Chen, Department of Physical Therapy, China Medical University, Taiwan

Yu-Jung Cheng, Department of Physical Therapy, China Medical University, Taiwan

Skeng K Wu, Department of Sport Performance, National Taiwan University of Sport, Taichung City, Taiwan

Background & purpose

Prior research has consistently found that children with developmental coordination disorder (DCD) are at increased risk for internalizing problems, such as anxiety and depression. However, the assessment of internalizing problems in children often relies on parent-reported questionnaires, which may not accurately capture emotional experiences. One of the potential solutions is the use of objective biomarkers, such as heart rate variability (HRV). Therefore, the purpose of this study was to examine the difference in HRV in children with and without DCD and to explore the relationship between HRV and internalizing problems.

Methods

Fourteen children with DCD and twenty-three children with typical development (TD) were recruited. All children

completed the assessment of HRV, and parents were requested to complete the Child Behavior Checklist to report their children's internalizing problems. However, two children were excluded from the final analysis due to invalid data on internalizing problems ($n = 1$ DCD) and HRV ($n = 1$ TD).

Results

Children with DCD showed significantly more internalizing problems (56.00 vs. 48.91, $p < 0.05$) and lower HRV, as evidenced by shorter average RR intervals (654.69ms vs. 721.41ms, $p < 0.01$), higher average heart rate (91.85bpm vs. 83.45bpm, $p < 0.05$), fewer NN50 counts (20.38 vs. 33.73, $p < 0.05$), and lower pNN50 (10.19 vs. 16.82, $p < 0.05$). However, internalizing problems was not significantly associated with any HRV variables.

Conclusion

Compared to TD children, children with DCD showed more internalizing problems and reduced HRV, which may indicate early parasympathetic dysfunction. However, the absence of a significant association between internalizing problems and HRV suggests that reduced parasympathetic activity may be linked to other life stressors, warranting further investigation.

Salivary cortisol and internalizing-externalizing problems in children with developmental coordination disorder

Authors:

Huynh Truc Tran, Department of Public Health, China Medical University, Taichung 406040, Taiwan

Wen-Chao Ho, Department of Public Health, China Medical University, Taichung 406040, Taiwan

Li-Wei Chou, Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung 406040, Taiwan

Yu-Jung Cheng, Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung 406040, Taiwan

Skeng K Wu, Department of Sport Performance, National Taiwan University of Sport, Taichung 404401, Taiwan

Yao-Chuen Li, Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung 406040, Taiwan

Background

While the association between internalizing/externalizing problems and motor difficulties in individuals with developmental coordination disorder (DCD) has been theorized, the role of cortisol, a stress hormone, remains unexamined. Therefore, this study investigated salivary cortisol levels in children with DCD and examined whether the associations between cortisol and internalizing and externalizing problems may differ between children with and without DCD.

Methods

Thirty-one children aged 6–10 years (8 DCD, 25.81%) who provided valid data were enrolled. Children with DCD met diagnostic criteria of the DSM-V. The Child Behavior Checklist was used to assess internalizing and externalizing problems.

Two saliva samples were collected at awakening and 30 minutes later. The Cortisol Awakening Response was calculated as the difference between the two salivary cortisol levels divided by the baseline value. Groupwise correlation analysis was conducted to examine the difference in the correlations between groups.

Results

Compared to typically developing (TD) peers, children with DCD had significantly higher levels of aggressive behaviors, social problems, and overall problems. A significant group difference was found in the relationship between withdrawn symptoms and cortisol at awakening ($z_{\text{observed}} = -2.570$, $p < 0.05$). In TD children, withdrawn symptoms were significantly negatively associated with cortisol ($r = -0.433$, $p < 0.05$), whereas in children with DCD, a marginally significant positive association was

found ($r = 0.683$, $p < 0.10$). Another significant group difference emerged in the association between thought problems and cortisol 30 minutes after awakening ($z_{\text{observed}} = -2.381$, $p < 0.05$), with a marginally significant negative association in TD children ($r = -0.358$, $p < 0.10$) and no significant correlation in children with DCD.

Conclusions

Findings indicate altered associations between cortisol and symptoms of internalizing/externalizing problems in children with DCD, suggesting potential hypothalamic-pituitary-adrenal axis dysfunction. These differences may add in early identification of children with DCD at greater mental health risk. However, larger, longitudinal studies are needed to validate and extend these results.

Motor Coordination Difficulties in School-Aged Children Born Preterm: A Comparison with Term-Born Typically Developing Children and Those with Neurodevelopmental Disorders

Authors:

Nanako Hironaka, Nagasaki University
Ryoichiro Iwanaga, Nagasaki University
Miyu Murata, Nagasaki University

Akiko Tokunaga, Nagasaki University
Kimiko Deguchi, Kids & Family Clinic Deguchi Pediatrics
Ken Inoue, National Center of Neurology and Psychiatry

Introduction

This study aimed to clarify the characteristics of motor coordination difficulties in schoolaged children born preterm by comparing them with term-born typically developing children and term-born children with neurodevelopmental disorders.

Methods

Parents of Japanese children aged 6–12 years were asked to complete a self-administered questionnaire. Responses were obtained from parents of 35 children born preterm (<37 gestational weeks), 137 term-born typically developing children (≥37 weeks), and 29 termborn children with neurodevelopmental disorders (≥37 weeks). Preterm children were further classified into extremely preterm (<28 weeks), very preterm (28–31 weeks), and moderate-to-late preterm (32–36 weeks) groups for analysis.

Results

For the total motor score, both preterm children (<37 weeks) and children with neurodevelopmental disorders showed significantly lower scores compared with term-born typically developing children, with no significant difference between the preterm and neurodevelopmental disorder groups. When examined by gestational age subgroup, children born before 32 weeks showed significant differences from typically developing children across all motor domains, demonstrating a pattern similar to that observed in children with neurodevelopmental disorders. In contrast, moderate-to-late preterm children (32–36 weeks) did not differ significantly from typically developing children in the posture and balance, gross motor, ball skills, or oral motor domains, although they scored significantly lower in the fine motor domain.

Conclusion

These findings suggest that children born before 32 weeks exhibit global motor coordination difficulties similar to those observed in children with neurodevelopmental disorders. Even among those born at or after 32 weeks, some motor coordination difficulties—particularly in fine motor skills—were still evident. These results indicate that the nature of motor coordination difficulties varies depending on gestational age at birth.

A prospective study on the impact of Developmental Coordination Disorder traits on emotional/behavioral problems during the transition from preschool to school age

Authors:

Sumika Fujisawa, Department of Human Developmental Sciences, Ochanomizu University, Japan

Aya Saito, Faculty of Core Research Human Science Division, Ochanomizu University, Japan

Masumi Sugawara, Department of Developmental Psychology, Faculty of Human Studies, Shirayuri University, Japan

Akio Nakai, Research Institute for Education & Graduate School of Clinical Education, Mukogawa Women's University, Japan

Introduction

Limited studies have examined the causal relationship between developmental coordination disorder (DCD) and emotional/behavioral problems during the preschool-to-school-age transition period. This study explored these associations using a cross-lagged effects model.

Methods

A longitudinal questionnaire survey was conducted at two time points: October–December 2021 (preschool; Time 1) and July–September 2022 (first grade; Time 2). Questionnaires were distributed to caregivers of 5–6-year-olds who underwent school-entry health checkups in City Y. Data from 151 children (86 boys; mean age: Time 1 = 73.0 ± 3.9 months, Time 2 = 81.2 ± 3.9 months) with complete responses at both time points were

analyzed. DCD traits were assessed using the Developmental Coordination Disorder Questionnaire – Japanese version (DCDQ-J) (Nakai et al., 2011); emotional /behavioral problems were evaluated using four subscales from the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). These were emotional problems, conduct problems, peer problems, and prosocial behavior.

Results

The cross-lagged model revealed that preschool DCD traits predicted conduct problems in the first grade. Conversely, peer problems at Time 1 predicted DCD traits at Time 2. No causal associations were found between DCD traits, emotional symptoms, and prosocial behavior. Further item-level analyses indicated that preschool DCD traits predicted specific conduct

problems, such as “Often loses temper” and “Often fights with other children or bullies them.”

Discussion

These findings suggest that difficulties associated with DCD traits may manifest as conduct problems during the school-age transition period. In educational and home settings, insufficient understanding of DCD traits may lead to excessive scolding or misinterpretation of behaviors, which may exacerbate emotional and behavioral issues. Therefore, it is important to recognize that motor coordination difficulties may underlie behavioral problems, necessitating early identification and appropriate support.

Genome-wide association studies of gross- and fine-motor coordination in the Norwegian Mother, Father and Child Cohort Study (MoBa)

Authors:

Hayley S Mountford, Department of Psychology, University of Edinburgh, UK.

Yonas Hirutu, Biological and Medical Sciences, Oxford Brookes University, UK

Elizabeth C. Corfield, MRC Integrative Epidemiology Unit, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK

Stian Valand, PsychGen Centre for Genetic Epidemiology and Mental Health, Norwegian Institute of Public Health, Oslo, Norway

Michelle Luciano, Department of Psychology, University of Edinburgh, UK

Helga Ask, PROMENTA Research Center, University of Oslo, Oslo, Norway.

Dianne F. Newbury, Biomedical Research Centre, University of Oxford, Oxford, UK.

Anna L. Barnett, Centre for Psychological Research, Oxford Brookes University, UK

Alexandra Havdahl, Psychiatric Genetic Epidemiology Group, Research Department, Lovisenberg Diakonal Hospital, Oslo, Norway.

Introduction

Twin-studies indicate that genetics contributes to neurodevelopmental conditions, including developmental coordination disorder (DCD). Unlike equally common conditions (e.g., autism, dyslexia), the biological basis of DCD remains largely uncharacterised, and the specific genes and molecular pathways are unknown. Genomewide association studies (GWAS) can identify common genetic variants associated with clinical outcomes (e.g., DCD) and related traits such as motor coordination. As adequately powered datasets containing both genetic data and sufficient DCD cases are limited, quantitative motor-coordination measures are employed as a proxy.

Methods

Using data from the Norwegian Mother, Father and Child Cohort Study (MoBa), parental reports of difficulties at age 5 for eight gross- and four fine-motor items from the Child Development Inventory were summed, with lower scores indicating greater difficulties. Separate GWAS were conducted for gross- and fine-motor scales in participants with both genetic and phenotypic data ($N=27,053$; 50.4% female). SNP-based heritability estimates and genetic correlations were calculated using LDSC.

Results

No genomic regions met the genome-wide significance threshold ($p < 5 \times 10^{-8}$) for either trait. For gross-motor coordination, 21 genomic regions containing 14 mapped genes showed suggestive association ($p < 1 \times 10^{-5}$). For fine-motor, 32 regions containing

39 mapped genes met the suggestive threshold. SNP-based heritability estimates found 6.19% (95%CI[2.4-10.0], $p=0.0005$) of gross-motor and 3.44% (95%CI[-0.2-7.1], $p=0.0294$) of finemotor variability was captured by our GWASs. Gross-motor coordination showed a moderate genetic correlation with autism ($r_g = -0.41$, $SE=0.15$, $p=0.007$) but not ADHD ($r_g = 0.05$, $SE=0.09$, $p=0.153$). Fine-motor showed moderate genetic correlation with ADHD ($r_g = -0.43$, $SE=0.21$, $p=0.039$) and autism ($r_g = -0.32$, $SE=0.225$, $p=0.153$), although not significant.

Conclusions

Although no genome-wide significant loci were identified, we show that common SNPs contribute to the genetics of motor-coordination, relevant to DCD. These suggestive association regions provide an important first step towards understanding the biology of this common neurodevelopmental condition.

Risk of DCD and behavioural problems in preterm children aged 5 to 10 years

Authors:

Barbara Caravale, Sapienza University of Rome, Italy
Claudia Gullace, Sapienza University of Rome, Italy
Beatrice Piunti, Sapienza University of Rome, Italy
Michela De Cicco, Sapienza University of Rome, Italy
Ylenia Micci, Sapienza University of Rome, Italy
Lucilla Ravà, IRCCS Bambino Gesù Hospital, Rome, Italy
Carlo Di Brina, Policlinico Umberto I Hospital, Rome, Italy

Introduction

Preterm birth is a primary risk factor for developmental coordination disorder (DCD). Although neurodevelopmental follow-up has expanded in recent years, motor coordination and behavioural difficulties in preterm children often remain underestimated. This study compared motor and behavioural characteristics of preterm and term-born children aged 5–10 years and examined perinatal and environmental predictors of DCD risk.

Methods

The sample included 111 preterm and 79 term-born children. Parents completed the Developmental Coordination Disorder Questionnaire – Italian version (DCDQ-IT), the Movement Assessment Battery for Children-2 Check-List (MABC-2-

CL), and the Strengths and Difficulties Questionnaire (SDQ). Perinatal and sociodemographic variables were analysed using Poisson regression models.

Results

Preterm children showed lower DCDQ-IT total scores ($p < 0.05$) and, compared with termborn peers, a higher frequency of fine motor difficulties (30.6% vs 13.9%, $p = 0.008$), as well as higher MABC-2-CL total scores ($p = 0.005$). They also had higher SDQ scores for emotional symptoms ($p = 0.047$), hyperactivity/inattention ($p = 0.022$), and peer problems ($p < 0.001$), with a greater proportion of children falling in the clinical range for peer problems (35.2% vs 11.4%). Higher maternal age (IRR = 1.14, $p < 0.001$) and respiratory distress syndrome (IRR = 5.27, $p = 0.03$) were associated with a greater risk of DCD, whereas

higher socioeconomic status was protective (IRR = 0.15–0.24, $p < 0.001$).

Conclusions

Preterm children show a higher risk of DCD, particularly affecting fine motor skills, together with more behavioural difficulties. Perinatal factors, especially maternal age and early respiratory complications, contribute to individual vulnerability profiles. These findings support systematic monitoring of motor and behavioural development in preterm children from early school age.

Foot Morphology Influences Plantar Pressure Shifts and Standing Balance in Children with Developmental Disorders

Authors:

Toshiya URUSHIHATA, Human Dynamics Laboratory, Department of Physical Therapy, Graduate School of Health Sciences, Aomori University of Health and Welfare, Aomori, Japan

Kanta KIMURA, Department of Rehabilitation, Aomori Shintoshu Hospital, Aomori, Japan

Aoi NAGAI, Department of Rehabilitation, Hirosaki Kinen Hospital, Hirosaki, Japan

Background and Purpose

Children with developmental disorders often show impaired balance, increasing avoidance of physical activity and obesity and a higher prevalence of flatfoot. Despite its critical role for balance, few studies have investigated the relationship between foot morphology and balance in this population. This study aimed to address this research gap.

Methods

Nineteen elementary school children (grade 1–6) from special support classes participated. Foot morphology was assessed by foot length, width, and footprint indices: Clarke's angle (CA), Chippaux–Smirak Index (CSI), and Staheli Index (SI). Plantar pressure was measured with F scan II during a 7 s single leg standing test, calculating mean peak pressure in forefoot, midfoot, and rearfoot. Balance, anterior (ANT), posteromedial (PM), and posterolateral (PL), was evaluated with the Y Balance

Test (YBT). Two trials per side were averaged, after normalizing to leg length. Pearson partial correlations controlled for age, height, weight, foot length, and width.

Results

Of all participants, 12 were classified as flatfoot or flatfoot tendency. CA showed strong positive correlations with forefoot and midfoot pressures ($r = 0.86$ – 0.99 , $p < .001$), while CSI and SI were strongly negatively correlated ($r = -0.84$ to -0.99 , $p < .001$). Left ANT reach correlated positively with SI ($r = 0.99$, $p < .001$) and negatively with CA ($r = -0.93$ to -0.95 , $p < .001$). Left PM and PL reach correlated negatively with CA and positively with CSI. YBT-pressure associations were limited in the right foot but significant in the left: ANT reach correlated negatively with toe/midfoot pressures and PL reach positively with rearfoot pressure.

Conclusion

Foot morphology was linked to increased forefoot loading and reduced anterior reach, suggesting contributions to balance impairment. Moreover, the significant left-sided associations indicate possible laterality. Thus, foot evaluations should be included in balance assessments; insoles or foot muscle training may improve balance in this population.

Brain Activation During Action Observation and Motor Imagery Using Self-Generated Own- and Other-Persons' Hand Videos

Authors:

Kengo Fujiwara, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University

Keisuke Irie, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University

Yuto Iwanaga, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University

Nanae Matsumoto, Institute for the Future of Human Society, Kyoto University

Ryusuke Nakai, Institute for the Future of Human Society, Kyoto University

Nan Liang, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University

Introduction

Developmental coordination disorder (DCD) shows reduced brain activation and reduced motor imagery (MI) vividness when performing MI of difficult motor tasks. Because MI-related brain activity depends on MI vividness, several multisensory strategies have been developed to compensate for this limitation. We focused on visual information and created self-generated own-hand videos that made participants appear to perform the task themselves, even for movements that were difficult or impossible for them to execute with the left hand. Using functional magnetic resonance imaging (fMRI), we examined how these videos affect brain activation and subjective experiences during combined action observation and MI (AOMI).

Methods

Thirty-six right-handed healthy adults (23 males, 13 females; mean age = 23.2 ± 3.4 years) participated after providing informed consent. The task involved imagining transporting a marble with chopsticks using the left hand under three visual conditions: (1) black screen (NO), (2) other-person's hand video (OTHER), and (3) own-hand video (OWN; mirrorreversed right-hand recording). Imaging was performed with a fMRI (block design: 20 s MI, 30 s rest). MI vividness, body ownership, and agency were rated after each condition.

Results

Compared with the OTHER and NO conditions, the OWN condition elicited greater activation in the precentral gyrus, supplementary motor area (SMA), inferior parietal lobule, and

cerebellum. While SMA and cerebellar activations were also observed in the OTHER and NO conditions, their activation magnitudes were highest in the OWN condition. In the OWN condition, body ownership, agency, and MI vividness were positively correlated with neural activation, and mediation analysis revealed an indirect effect of ownership on brain activity via vividness.

Discussion

Self-generated OWN condition enhanced embodied neural activity related to AOMI. Although the present study involved healthy adults, this approach may provide a promising avenue for enhancing MI vividness and could be explored in future studies with individuals with DCD.

Accuracy and Temporal Variability of Hand-Foot Interlimb Coordination in Children with Developmental Coordination Disorder

Authors:

Iwanaga Yuto, Kyoto university

Introduction

Children with developmental coordination disorder (DCD) have difficulty adjusting the timing of their movements to external stimuli. Previous studies have examined interlimb coordination, including both homologous and non-homologous hand-foot combinations. However, comprehensive comparisons of movement accuracy and temporal variability across multiple hand-foot coordination patterns-ipsilateral, contralateral, and switching-are extremely limited. This study aimed to compare rhythmic hand-foot interlimb coordination between children with DCD and typically developing (TD).

Methods

This study was approved by the Ethics Committee of the Graduate School of Medicine and Faculty of Medicine at Kyoto University. Participants were 15 children with DCD (mean age = 9.4 ± 1.4 years; 14 boys) and 15 TD children (mean age = 8.9 ± 1.5 years; 8 boys). They pressed buttons placed on the desk and the floor, completing 10 responses per task after practice trials.

Six hand-foot coordination tasks were performed in synchrony with a 1-Hz metronome: two ipsilateral tasks (right hand and foot, left hand and foot), two contralateral tasks (right hand-left foot, left hand-right foot), and two switching tasks alternating the ipsilateral and contralateral pairs, respectively. Outcome measures included: (1) number of correct responses, (2) reaction time (RT) and its variability, (3) temporal errors (relative and absolute) with the metronome beat and their variability, and (4) duration time (DT) and its variability.

Results

The DCD group showed fewer correct responses during switching both ipsilateral and contralateral coordination. Temporal error variability was greater in ipsilateral and switching coordination, while RT variability was greater in contralateral and switching coordination. However, no group differences were observed in mean RT, mean temporal error, or DT.

Discussion

Children with DCD demonstrated reduced movement accuracy and increased temporal variability during contralateral and switching hand-foot interlimb coordination tasks, suggesting difficulties in sensorimotor timing and interhemispheric control.

Research protocol investigating mechanisms of anticipatory postural adjustment deficits in children with developmental coordination disorder

Authors:

Ludvík Valtr, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Reza Abdollahipour, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Lucia Bizovská, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Tomáš Klein, Department of Natural Sciences in Kinanthropology, Faculty of Physical Culture, Palacký University Olomouc, Olomouc, Czechia

Bouwien Smits-Engelsman, Division of Physiotherapy, Department of Health and Rehabilitation Sciences, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa

Introduction

Children with Developmental Coordination Disorder (DCD) exhibit atypical Anticipatory Postural Adjustments (APAs), but the underlying neuromechanical and sensory mechanisms remain unclear. This study aims to identify factors contributing to APAs dysfunction, including motor planning deficits, neuromotor noise, and visual integration.

Methods

Sixty children aged 9–12 years (30 diagnosed with DCD and 30 typically developing) will perform a self-initiated dynamic reaching task while standing on one leg on a force platform. The task requires grasping and relocating an object under four conditions: baseline, preplanned, unpredictable change,

and predictable change in target location. These conditions manipulate movement predictability to assess anticipatory and online control. Postural dynamics will be recorded using dual force platforms to capture ground reaction forces and center of pressure trajectories. Neuromuscular activation will be measured with surface EMG and decomposed EMG from key postural muscles, enabling analysis of timing, sequencing, and motor unit recruitment variability. Visual processing will be assessed using mobile eye-tracking glasses to determine gaze fixation timing and stability during movement preparation and adaptation. Each participant will complete five blocks of six trials, with systematic variation in predictability and mid-movement perturbations. This design allows assessment of APAs fine-tuning, adaptability, and reliance on reactive versus anticipatory strategies under controlled uncertainty.

Results

We hypothesize that children with DCD will exhibit delayed and inconsistent APAs, increased neuromotor noise, and reduced visual integration, relying more on reactive adjustments than anticipatory control.

Discussion/Conclusion

This protocol will clarify mechanisms contributing to APAs deficits in DCD, providing a foundation for targeted interventions aimed at improving balance, reducing fall risk, and enhancing functional independence.

Funding: This project was selected for funding by the Czech Science Foundation [GAČR 26-23458S]

Investigating reach-to-manipulate coordination during online correction in children with developmental coordination disorder using principal component analysis

Authors:

Quting HUANG, Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China

Chi-Wen Chien, Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China

Background

Reach-to-manipulation is a natural functional hand movement, relying on well-organized coordination across multiple joints. This study examined how multi-joint coordination is organized and altered by online correction (i.e., when movements are perturbed during execution) in children with developmental coordination disorder (DCD).

Methods

Thirty children with DCD and thirty children with typical development (TD) (9.35 ± 1.74 years for DCD, 9.17 ± 1.66 years for TD; 24 boys and 6 girls in each group) performed a double-step reach-to-manipulate task. Manipulation demands included no, simple rotation (SR), and complex rotation (CR). Hand movements were captured using a Vicon system, and joint displacement data from 12 degrees of freedom (DoF) of the thumb and fingers were processed. Coordination was quantified

using principal component analysis; outcomes included variance explained by principal components (PC), DoF loadings in the leading PCs, time-varying coordination pattern and atypical kinematics score.

Results

The first three PCs captured over 80% of the variance in both groups and conditions across reach-to-manipulate phases. The first PC always explained less variance in the DCD group than in the TD group, with a larger reduction in the jump trials across tasks. Loading patterns showed broadly similar task-specific DoF couplings in the leading PCs in both groups, but the DoF couplings were more variable in the DCD group under jump trials. Time-varying coordination patterns further identified longer periods of atypical coordination in children with DCD across all DoFs, particularly in SR and CR during jump trials. Consistent with these patterns reflected by PCA, atypical

kinematics scores increased from non-jump to jump trials in both groups but were significantly higher in the DCD group across all tasks and conditions.

Discussion/Conclusion

This study suggests that children with DCD had systematic coordination difficulties in performing reach-to-manipulate movement, particularly when online correction was required and manipulation demands were increased.

Establishing Culturally Relevant Norms for the MABC-2 in South African Children

Authors:

Dané Coetzee, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Evi Verbecque, Rehabilitation Research Centre - REVAL, Faculty of Rehabilitation Sciences, Hasselt University, Diepenbeek, Belgium

Anita E. Pienaar, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Bouwien Smits-Engelsman, Faculty of Health Sciences, Physical Activity, Sport and Recreation (PhASRec), Potchefstroom, South Africa

Background

The Movement Assessment Battery for Children – Second Edition (MABC-2) is the most widely used tool worldwide for identifying motor coordination difficulties. However, its norms are derived from Western, high-income populations, which may not reflect the developmental realities of children growing up in diverse sociocultural environments. In countries such as South Africa, where children's motor development is shaped by heterogeneous socio-economic conditions, school quality, and play experiences, the use of imported norms may distort estimates of the prevalence of motor coordination difficulties.

Objective

We aimed to establish culturally and contextually appropriate normative data for the MABC-2 for South African children aged 6–12 years, providing a framework for more accurate identification of DCD.

Methods

A retrospective secondary analysis was performed using anonymised data from 2,064 children attending public schools across four South African provinces. Stratified sampling ensured balanced representation by sex (50.2% boys) and socio-economic status. Raw scores were transformed into z- and scale scores to generate local percentile ranks and age-band cut-offs. Paired t-tests compared these South African norms to the original Dutch reference data.

Results

Significant score discrepancies ($p < 0.001$) were observed across all items when comparing the Dutch and South African norms. Using Dutch norms, 34% of South African children fell below the 5th percentile for manual dexterity, six times the expected rate. Ceiling effects were evident for certain balance items, independent of the norms used.

Conclusion

Motor performance is deeply influenced by children's cultural, environmental, and socio-economic contexts. The findings underscore the importance of developing regionspecific MABC-2 norms, as reliance on Western standards may lead to over-identification or misdiagnosis of DCD in non-Western populations. Establishing local norms in South Africa and other countries with similar developmental contexts represents a critical step toward culturally equitable and valid motor assessment globally.

Beyond motor skills: longitudinal outcomes of children with developmental coordination disorder through adolescence

Authors:

Marinella Garotta, Parole e Movimento - Lainate

Introduction

Developmental Coordination Disorder (DCD) is a neurodevelopmental condition that often persists into adolescence and adulthood, significantly affecting academic performance, emotional wellbeing, and social participation. Longitudinal studies report symptom persistence in 50–70% of cases, but developmental outcomes appear to be influenced by cognitive level, emotional adjustment, environmental support, and rehabilitation type.

Methods

This longitudinal study included 19 children diagnosed with DCD, followed across different developmental stages:

- 7 participants from primary school to the end of upper secondary school,
 - 9 participants from primary to lower secondary school,
 - 3 participants from preschool to primary school.
- Clinical, cognitive, and observational data were collected at multiple time points. Analyses focused on the relationship between initial IQ, comorbidity (particularly genetic syndromes), type of rehabilitation (speech therapy,

psychomotor therapy, or integrated dual intervention), and outcomes in autonomy, academic achievement, social adaptation, and emotional wellbeing.

Results

Preliminary findings indicate that both cognitive level and type of intervention play a significant role in developmental outcomes. Participants with average or above-average IQ and integrated speech-psychomotor therapy showed better levels of autonomy, emotional balance, and social adaptation. Conversely, children with lower IQ or single-type interventions exhibited slower progress and greater difficulties in self-regulation and school adjustment.

Discussion/Conclusion

These findings highlight the need for multidisciplinary, long-term rehabilitation pathways that address not only motor coordination but also emotional resilience and social competence. Early identification and integrated care appear

to enhance developmental trajectories and quality of life in individuals with DCD. The quality and continuity of intervention emerge as key determinants in promoting adaptive outcomes across the lifespan.

Watch me do it: A free-to-access video resource to support motor learning in children with DCD

Authors:

Griet Warlop, Department of Sport and Exercise Sciences, Manchester Metropolitan University

Greg Wood, Department of Sport and Exercise Sciences, Manchester Metropolitan University

Paul S. Holmes, Department of Sport and Exercise Sciences, Manchester Metropolitan University

Sally Payne, Royal College of Occupational Therapists

David J. Wright, School of Psychology, Manchester Metropolitan University

Introduction

Our research has shown that using first-person viewpoint movement demonstration videos alongside physical practice can help children with Developmental Coordination Disorder (DCD; dyspraxia) learn activities of daily living more easily than physical practice alone. To translate these research findings into applied practice, we developed a website, co-produced with occupational therapists, children with DCD, and their parents/guardians, containing a library of movement demonstration videos to help children with DCD learn various everyday movement skills.

Methods and Results

An online survey of individuals with lived experience of DCD and professionals who support children with DCD was conducted to identify which everyday movement skills children

with DCD find challenging to learn. Right- and left-handed firstperson viewpoint video demonstrations were then created for each skill using typically developing child models to provide the demonstrations. Ongoing input from an experienced paediatric occupational therapist ensured that the videos demonstrated an appropriate functional technique for each skill. The website, called “Watch me do it” (<https://watchmedoit.mmu.ac.uk/>), is free-to-access for children with DCD, their families, or professional who support them.

Conclusion

This poster presents the underpinning research, outlines the co-production process used to develop the video demonstrations and website, and provides an update on how the resource is currently used internationally across various health and educational settings. Conference delegates will be encouraged to

access, use, and share the link to the website to support children with DCD.

Fine Motor Function Characteristics and Their Correlation with Symptom Severity in Children with Attention-Deficit/Hyperactivity Disorder Comorbid with Developmental Coordination Disorder Based on MABC-2

Authors:

Chunmiao Wang, China Institute of Sport Science

Jiaxin Chen, China Institute of Sport Science

Yanjie Chen, Beijing Children's Hospital, Capital Medical University

Haixia Hu, Ai You Dong Institute of Child and Adolescent Sports and Health

Yanfeng Zhang, China Institute of Sport Science

Objective

This study aimed to investigate the characteristics of fine motor function in children with Attention-Deficit/Hyperactivity Disorder (ADHD), particularly in a subgroup meeting the criteria for comorbid Developmental Coordination Disorder (DCD), and to analyze the correlation with the severity of core ADHD symptoms, using the Movement Assessment Battery for Children-2 (MABC-2).

Methods

A total of 48 children with ADHD and 56 typically developing children were recruited as the study and control groups, respectively. All participants were assessed using the MABC-2 to evaluate fine motor skills, and children with ADHD who met the test criteria for DCD were identified.

Independent samples t-tests were used to compare MABC-2 scores between groups. Correlation analysis and multiple linear regression were employed to examine the relationship between motor function and ADHD symptom severity.

Results

The ADHD group scored significantly lower than the control group across all MABC-2 dimensions (manual dexterity, aiming and catching, and balance) (all $P < 0.01$). A substantial proportion of children with ADHD exhibited motor coordination difficulties reaching the diagnostic threshold for DCD.

Correlation analysis revealed a significant positive correlation between the total ADHD symptom score and manual dexterity ($r = 0.408$, $P = 0.004$). After controlling for age and gender, multiple linear regression

confirmed that manual dexterity was an independent predictor of ADHD symptom severity (Beta = 0.332, $P = 0.021$).

Conclusion

Children with ADHD demonstrate significant impairments in fine motor function, with a subset meeting the criteria for comorbid DCD. The close association between manual dexterity and ADHD symptom severity suggests that motor coordination deficits (DCD) are not merely a comorbid condition but may represent a core component sharing common neurodevelopmental pathways with ADHD.

Routine motor function screening for children with ADHD and integrated intervention strategies addressing both motor skills and behavioral symptoms are strongly recommended, especially for those with co-occurring DCD.



Keynote Speaker 2

Moving into adulthood: the progression and impact of DCD

Author: Anna L. Barnett

Professor of Psychology, Centre for Psychological Research,
Oxford Brookes University

In this presentation I track some of the research that has helped us start to understand how DCD progresses through the lifespan, using examples from my own work across my career.

My first publication, 35 years ago, described a 10-year follow-up study of children diagnosed with DCD at age 6 years. It featured a range of assessments including teacher reports, motor testing and a neurological examination. It demonstrated the persistence of motor difficulties into adolescence as well as a range of accompanying social and psychological difficulties. This is one of the few longitudinal studies conducted and it helped to raise awareness that DCD was not just a condition of childhood.

Since that publication, over 85 studies have examined DCD in young adults, most comparing performance to typically developing age peers. This body of work describes a range of motor difficulties in adults, using a variety of techniques from simple observation checklists to sophisticated 3D motion analyses. It also clearly demonstrates that difficulties commonly extend beyond the motor domain.

A major limitation of most DCD research beyond childhood is the lack of appropriate standardized motor assessments. This has motivated our work on the development of the MABC Test to deliver norms for an extended age range; up to 25 years in the latest edition. The MABC Checklist has also evolved; our latest edition is closely aligned with the Test structure and age range, providing a complementary measure of performance in activities of daily living. Non-motor factors are recorded and a new section in the Checklist prompts a description of the impact of motor difficulties on an adult's participation at home, work and in leisure.

In this presentation I will use case studies to illustrate individual progression and the impact of DCD in adulthood and to highlight priority areas for future work.



Verbal Session 5 - Mechanisms

Kinematic gait adaptations when dual-tasking in children with Developmental Coordination Disorder compared to typically developing peers: A preliminary study

Authors:

Michelle Verhoeven, Department of Rehabilitation Sciences, Faculty of Medicine and Health Science, Ghent University, Ghent, Belgium

Frederik Deconinck, Department of Movement and Sports Sciences, Faculty of Medicine and Health Science, Ghent University, Ghent, Belgium

Lynn Bar-On, Department of Rehabilitation Sciences, Faculty of Medicine and Health Science, Ghent University, Ghent, Belgium

Introduction

Walking is a fundamental rhythmic motor skill that automates throughout childhood. This automatization allows for the performance of additional tasks simultaneously (dual-tasking). Children with Developmental Coordination Disorder (DCD) exhibit difficulties in automating motor skills, which may lead to altered gait patterns, particularly under dual-tasking conditions. This study investigates gait adaptations in children with DCD compared to typically developing children (TDC) using a dual-tasking paradigm.

Methods

We conducted 3D gait analysis on the Gait Real-time Analysis Interactive Lab (GRAIL) at Ghent University Hospital. Thirty children with DCD (7-17y) and 30 age- and gender-matched TDC walked on the treadmill under three conditions: at

comfortable walking speed (CWS), while cognitive dual-tasking (CDT), and while motor dual-tasking (MDT). Thus far, data of five participants per group (10-13y) were analyzed. Left and right sagittal hip, knee, and ankle kinematics were compared between groups (TDC-DCD) and conditions (CWS-CDT-MDT) using Statistical Parametric Mapping (SPM) with a 2x3 repeated-measures ANOVA. Significant effects were further explored with Bonferroni-corrected post-hoc tests.

Results

For all joints, SPM analysis found a significant main effect of walking condition ($p < 0.05$) across the gait cycle (GC), with no significant group or interaction effects. Significant clusters were observed for left/right sagittal hip (100/91% GC), knee (34/65% GC), and ankle (60/21% GC) joints. Post-hoc analyses showed significant clusters between all walking conditions (CWS-CDT,

CWS-MDT, and CDT-MDT) ranging from 10-86% of the GC ($p_{\text{corr}} < 0.0167$).

Discussion/Conclusion

Preliminary results show that during several phases in the GC, children adjust their lower-body kinematics to their walking context. However, from the preliminary analysis, no apparent kinematic differences are noted between TDC and children with DCD. Our future analysis will include a higher study power, more refined analyses (e.g. on discrete and spatiotemporal parameters), and a broader age range to further investigate gait of children with DCD in dual-task contexts and potential differences with TDC.

Finger and Toe Haptic Perception in Children with and without Developmental Coordination Disorder

Authors:

Wei-Shan Chen, Department of Kinesiology, National Hsing Hua University, Hsinchu, Taiwan

Shi-Mei Jiang, Department of Kinesiology, National Hsing Hua University, Hsinchu, Taiwan

Ting-Yi Hsueh, Department of Kinesiology, National Hsing Hua University, Hsinchu, Taiwan

Yu-Ting Tseng, Department of Kinesiology, National Tsing Hua University, Taiwan & Research Center for Education and Mind Sciences, National Tsing Hua University, Taiwan

Introduction

Developmental Coordination Disorder (DCD) affects motor coordination and daily functioning. While previous studies have documented upper limb haptic deficits in children with DCD, lower limb remains unexplored. This study provides comprehensive assessment of both finger and toe haptic perception in children with and without DCD, examining developmental changes by comparing children with adults.

Methods

Ninety-three participants included 31 children with DCD, 31 typically developing (TD) children (both groups aged 7-8 years), and 31 healthy adults (aged 19-25 years). All participants completed finger and toe haptic perception tasks, measuring sensitivity and acuity via curvature detection and discrimination thresholds, respectively.

Results

Kruskal-Wallis test showed significant group differences across all finger and toe haptic measures (finger-sensitivity: $p < .001$; finger-acuity: $p < .001$; toe-sensitivity: $p < .001$; toe-acuity: $p < .001$). Post hoc comparisons indicated that children with DCD showed significantly lower performance than TD children in both finger- and toe-acuity tasks (finger-acuity: 6.25 ± 2.64 vs. 4.20 ± 2.07 ; toe-acuity: 7.92 ± 3.19 vs. 5.49 ± 2.11), but not in sensitivity tasks (finger-sensitivity: 8.29 ± 2.84 vs. 6.84 ± 3.16 ; $p = .07$; toe-sensitivity: 9.77 ± 3.72 vs. 9.12 ± 3.35 ; $p = .40$). Importantly, adults significantly outperformed both child groups across all measures (finger-sensitivity: 3.69 ± 1.81 ; finger-acuity: 2.50 ± 1.37 ; toe-sensitivity: 6.01 ± 2.30 ; toe-acuity: 3.75 ± 2.04).

Discussion

Children with DCD demonstrate impaired finger and toe haptic perception, especially in acuity tasks, compared to TD children.

This extends previous evidence linking somatosensory deficits in DCD to fine motor and balance difficulties. Adults outperformed both child groups across all measures, indicating continued haptic maturation beyond childhood. Haptic deficits across upper and lower limbs likely contribute to motor difficulties in DCD, highlighting the needs for interventions targeting somatosensory processing in this population.

Sleep Disturbances in Children with Developmental Coordination Disorder: A Meta-analysis

Authors:

Junqi Li, Shanghai University of Sport

Binn Zhang, Shanghai University of Sport

Introduction

Sleep plays a foundational role in children's cognitive, emotional, and motor development. Given the lifelong functional impact associated with Developmental Coordination Disorder (DCD), understanding early-emerging sleep disturbances is critical for informing developmental trajectories and prevention-oriented practices. This metaanalysis examined differences in sleep dimensions between children with DCD and typically developing (TD) peers and explored heterogeneity across measurement approaches.

Methods

A systematic search of PubMed, Embase, and Web of Science was conducted from database inception to October 16, 2025. Eligible studies included quantitative comparisons of sleep parameters between DCD and TD children aged 5-12 years. Random-effects models were used to estimate standardized mean differences (SMD) across nine sleep dimensions. Subgroup analyses, publication bias tests, and sensitivity analyses were conducted.

Results

Five studies encompassing six independent samples (N=363) met inclusion criteria. Children with DCD demonstrated significantly higher sleep anxiety (SMD=0.63, $p<0.001$), sleep-disordered breathing (SMD=0.36, $p=0.021$), and bedtime resistance (SMD=0.33, $p=0.034$). Sleep duration showed marginally higher disturbance (SMD=0.46, $p=0.066$). No significant differences were observed in night waking, parasomnias, daytime sleepiness, sleep onset delay, or total sleep disturbance. Measurement tools partially accounted for heterogeneity ($p=0.072$). Publication bias was identified; trim-and-fill reduced the pooled effect to 0.025.

Conclusion

Findings indicate a selective pattern of sleep difficulties in DCD, concentrated in emotional and behavioral domains rather than physiological sleep architecture. Considering the longitudinal burden associated with DCD, early identification of anxietyrelated and pre-sleep behavioral issues may offer a

modifiable pathway influencing later participation, learning, and psychosocial outcomes across the lifespan. Integrating sleepfocused assessment and intervention into early DCD care may therefore support more adaptive developmental trajectories.

Observing and predicting one's own throw from a firstperson perspective: An EEG study

Authors:

Yosuke Kita, Keio University

Yuka Shirakawa, Keio University

Junki Inoue, Tokyo Metropolitan University

Ryo Watanabe, Tokyo Metropolitan University

Kaito Shimizu, Tokyo Metropolitan University

Hiroki Nakamoto, National Institute of Fitness and Sports in Kanoya

Takahiro Higuchi, Tokyo Metropolitan University

Introduction

Prediction is vital for voluntary actions, utilizing an internal model to predict the sensory feedback. Individuals predict their own actions more accurately than others, although the neurological features associated with predicting their actions from a firstperson perspective remain unknown. This study investigated the temporal aspects of these characteristics using an electroencephalogram. It also examined the abnormalities in individuals with impaired motor coordination, which may involve disrupted internal models.

Methods

Nineteen adult participants watched first-person perspective videos of a ball being thrown at a target. They were asked to determine whether the action was theirs or someone else's and to

predict whether the ball would hit or miss the target.

Results & Discussion

Consequently, predicting one's own actions was more accurate than predicting the others' actions. Neural activity during the prediction of one's own actions increased compared to that during the prediction of others' actions, particularly in areas associated with the sensorimotor cortex. These differences in neural activity are linked to the activation levels of the mirror neuron system, suggesting that well-learned or highfrequency actions may activate this system. Furthermore, individuals with impaired motor coordination did not show the same variation in neural activity, suggesting potential impairments in their internal models. Impairments in generating internal action representations or mapping motor and sensory information to

the motor or somatosensory cortices may contribute to motor coordination disorders, such as developmental coordination disorders.

Impaired toilet training and bladder and bowel dysfunction in children with Developmental Coordination Disorder – an underreported issue

Authors:

Mathilde Joos, Ghent University

Loïc D'Haene, Ghent University

Prof. Dr. Lynn Bar-On, Ghent University

Dr. Amy De Roubaix, Ghent University

Prof. Dr. Christine Van den Broeck, Ghent University

Dr. Ellen Vandamme, Ghent University Hospital

Dr. Bieke Samijn, Ghent University Hospital and Ghent University

Introduction

While the significant impact of motor coordination difficulties on everyday functioning in children with Developmental Coordination Disorder (DCD) are well defined, one aspect that is often overlooked are toilet training difficulties and bladder and bowel dysfunctions (BBD). These issues may stem from motor planning deficits, sensory processing difficulties, and delayed central nervous system maturation. Despite the established association of these issues with other neurodevelopmental conditions, BBD is far less recognized in the context of DCD.

Methods

This case-control study examined the prevalence of toilet training difficulties and BBD in children with DCD compared to typically developing children (TDC). Eighty-four children aged

5-8 years participated (DCD vs. school grade- and sex-matched TDC, male n=66, female n=18), including 20 children with co-occurring ADHD and/or autism in the DCD group. Parents completed the Vancouver Symptom Score for Dysfunctional Elimination Syndrome (VSSDES) to assess bladder and bowel dysfunctions, the Dutch DCDquestionnaire (DCD-Q) for coordination difficulties, and additional questions regarding toilet training, elimination diagnoses and co-occurring conditions.

Results

Children with DCD showed significantly more toilet training difficulties ($p<0.001$), including persistent accidents (47.6% vs. TDC 9.5%), prolonged training (45.2% vs. TDC 4.8%), and poor recognition of urgency (40.5% vs. TDC 2.4%). Delayed bowel

and bladder control was more frequent in DCD ($p<0.05$), and BBD were also more prevalent ($p<0.001$), particularly urgency and constipation (both 73.8% vs. TDC 64.3% and 50.0%). Poorer motor skills correlated with greater dysfunctions ($r = -0.474$, $p<0.001$). Co-occurring ADHD or autism did not significantly worsen these issues.

Conclusion

The findings highlight the importance of awareness of such difficulties and symptoms in children with DCD, enabling timely and targeted care for affected children and their families. Future research should build on these findings by using clinical assessments and prospective measures to further enhance the reliability and generalisability of these outcomes in children with DCD.

Genetic variants in developmental coordination disorder: Genome-wide association studies of gross- and fine-motor coordination

Authors:

Hayley S Mountford, Department of Psychology, University of Edinburgh, UK.

Yonas Hirutu, Biological and Medical Sciences, Oxford Brookes University, UK

Elizabeth C. Corfield, MRC Integrative Epidemiology Unit, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK

Stian Valand, PsychGen Centre for Genetic Epidemiology and Mental Health, Norwegian Institute of Public Health, Oslo, Norway

Michelle Luciano, Department of Psychology, University of Edinburgh, UK

Helga Ask, PROMENTA Research Center, University of Oslo, Oslo, Norway

Dianne F. Newbury, Biomedical Research Centre, University of Oxford, Oxford

Anna L. Barnett, Centre for Psychological Research, Oxford Brookes University, UK

Alexandra Havdahl, Psychiatric Genetic Epidemiology Group, Research Department, Lovisenberg Diakonal Hospital, Oslo, Norway

Introduction

A genome-wide association study (GWAS) is a statistical analysis used to identify genetic variants associated with complex traits. In the context of developmental coordination disorder (DCD), conducting a GWAS is vital to understand the underlying genetic contribution and shedding light on the biological pathways involved. The predictive accuracy of GWAS results can be assessed in independent cohorts by calculating polygenic indexes (PGIs) and estimating how they associate with related outcomes across development.

Methods

Gross- and fine-motor coordination GWAS were conducted using data from the Norwegian Mother, Father and Child

Cohort Study (MoBa). Coordination difficulties were reported by mothers when the child was around 5 years old, using the Child Development Inventory (N=27,053 children, 50.4% female). GWAS results were used to calculate gross and fine-motor PGIs in an independent UK sample – the National Childhood Developmental Study (NCDS, N=6,410). Logistic regression models were used to predict four binary outcomes at age 7 years; parental reports of coordination difficulties when the child is walking, running, climbing stairs, and tying a bow.

Results

Neither gross- nor fine-motor PGIs were associated with coordination difficulties in the NCDS cohort. The gross-motor PGI explained £0.07% of variance in the four variables, and the

fine-motor PGI, explained £0.10% of variance in difficulties running, climbing stairs and tying a bow, and 0.54% of the variance in difficulties walking (OR=1.28, 95%CI=0.99-1.66, P=0.056).

Conclusion

Based on current GWAS results, our ability to predict trait variance on parental reports of coordination difficulties at age 7 was poor. This highlights the challenge of sufficient sample size and power limitations of the contributing GWAS and using different measures of coordination between independent cohorts. We demonstrate potential for using PGIs to identify shared genetic architecture between coordination measures, offering insight into how coordination measures relate to each other and ultimately to DCD.

Characterizing wrist proprioceptive precision among preschoolers with developmental coordination disorder

Authors:

Yu-Ting Tseng, Department of Kinesiology, National Tsing Hua University, Hsinchu City, Taiwan

Kuo-Cheng Liu, Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital at Linkou, Taoyuan, Taiwan

Wei-Shan Chen, Department of Kinesiology, National Tsing Hua University, Hsinchu City, Taiwan

Chia-Liang Tsai, Institutes of Physical Education, Health, and Leisure Studies, National Cheng Kung University, Tainan City, Taiwan

Emmanuel Bonney, School of Kinesiology, University of Minnesota, Minneapolis, MN, USA

Introduction

Proprioceptive deficits have been proposed as an underlying mechanism in Developmental Coordination Disorder (DCD), yet quantitative evidence in preschool-aged children remains limited. This study aims to 1) determine wrist proprioception differences among preschool-aged children (4-6 years) with and without DCD, and 2) examine the relationship between wrist proprioception and motor functioning across multiple domains.

Methods

119 children completed the Movement Assessment Battery for Children-2 (MABC-2) and were classified into DCD ($n = 26$, ≤ 5 th percentile), pDCD ($n = 26$, < 15 th percentile), and TD ($n = 67$, > 16 th percentile) groups. Participants performed a contralateral wrist joint position matching task. During this task, participants' non-preferred hand was passively moved

to a specific position, and they were asked to actively move their preferred hand to align with the given position. Position sense bias and precision were quantified using mean position sense error (PE) and standard deviation of position sense error (SDPE), respectively.

Results

Significant deficits were observed in SDPE, such that children with DCD exhibited significantly higher response variability compared to both pDCD ($p < .05$) and TD ($p < .001$) groups. The pDCD group was statistically indistinguishable from TD children ($p > .05$). Partial correlations controlling for age revealed that reduced proprioceptive precision was significantly associated with poorer manual dexterity in children with motor difficulties ($n = 52$, $r_s = -.28$, $p < .05$), but this relationship was absent in TD children.

Conclusions

Results suggest proprioceptive deficits in DCD are present in preschoolers. The findings establish a clear threshold effect where sensory deficits distinguish children with DCD from those with probable DCD or typical development. The domain-specific link between wrist proprioceptive precision and manual dexterity suggests that poor sensorimotor integration may be a critical early marker of impaired fine motor skills observed in this population.

Exploring effective video conditions for combined action observation and motor imagery learning in children: A preliminary study with typically developing children

Authors:

Hanna Park, Department of Physical Education, Seoul National University, Seoul, South Korea

Donghyun Ryu, Department of Physical Education, Seoul National University, Seoul, South Korea

Liis Uiga, Department of Sport and Exercise Sciences, Manchester Metropolitan University, Manchester, United Kingdom

Catherine M. Capio, Department of Physiotherapy, Hong Kong Metropolitan University, Hong Kong, Hong Kong SAR, China

Sebin Lim, Department of Physical Education, Seoul National University, Seoul, South Korea

Inseong Hwang, Department of Physical Education, Seoul National University, Seoul, South Korea

Introduction

Combined action observation and motor imagery (AOMI) has been recognized as an effective motor learning strategy for children with developmental coordination disorder (DCD), who experience persistent difficulties in acquiring the motor components of activities of daily living (ADLs) such as manipulating objects or performing bimanual movements. Given the importance of visibility of key movement cues in successful AOMI, it is critical to identify which combinations of video features (e.g., models, perspectives) effectively facilitate children's understanding and mental simulation of ADLs. Accordingly, as preliminary work for our subsequent AOMI interventions for DCD, this study involves typically developing (TD) children to identify these video features.

Methods

Twenty-five TD children aged 8-9 years will participate. Each child will watch 60 video clips that were recorded and screened to retain the most accurate and visually clear execution for each condition, representing five ADLs performed by three models (a female adult, a 9-year-old girl, and an 8-year-old girl) from four perspectives (first-person and three thirdperson views). After each clip, participants will rate how easily they think they could follow the observed movement using a 5-point Likert scale. Participants will then complete a brief interview to discuss the factors that influenced their evaluations of the clips. Additionally, eye movements will be recorded (EyeLink 1000 Plus) while participants watch the clips, allowing analysis visual

search behaviour within predefined areas of interest (AOIs) and identify video features that attract the relevant visual attention.

Expectation Results / Discussion

Likert ratings are expected to reveal which combination of model type and perspective children find easiest to follow. Interview responses and eye-tracking data, will help verify whether the most effective video clips direct attention to task-relevant cues and which features influence their judgment. These findings will inform the development of AOMI video materials for future application in children with DCD.



Verbal Session 6 -

Adults

Participation Patterns at the Home, School, Community and Workplace: Perspectives of Youth and Young Adults with Developmental Coordination Disorder

Authors:

Cheng Zeng, Lethbridge Layton Mackay Rehabilitation Center
Giovanna Rizzuto, McGill University
Julia Maddalena, McGill University
Nina Chang, McGill University

Marie-Anne Nguyen-Vu, McGill University
Yu-Hsin Hsieh, McGill University
Dana Anaby, McGill University

Introduction

Challenges associated with developmental coordination disorder (DCD) persist into adolescence and adulthood, which negatively impact current and future participation in occupations. However, evidence on the participation patterns of transition-aged youth affected by DCD is still emerging.

Objective

To better understand the perspectives of youth and young adults with DCD on their participation patterns across various settings: home, school, community and the workplace.

Methods

A descriptive qualitative design was employed. Sixteen youth

with DCD (9 males, 7 females) aged 12 to 20 (mean = 15.4) participated in two individualized meetings. During the first meeting, youth completed the Youth, Young-adult Participation and Environment Measure (Y-PEM). Then, in the second meeting, each youth reflected on their Y-PEM results through an individualized stimulated recall interview. Inductive content analysis was conducted.

Results

Seven categories were identified: three were informative, and four were reflective. Informative categories, closely related to Y-PEM constructs, included: Repertoire of activities that youth participate in, Environmental barriers and supports, and Strategies to promote participation. Reflective categories, providing insights into participation experiences, included

Achieving personal goals and hoped-for selves, Recognizing their own abilities, personal attributes and habits, What is guiding their participation, and Family impact.

Conclusions

Findings emphasize how environmental factors, such as the role of social and familial support, and personal factors, such as past experiences and participation aspirations, shape how youth with DCD choose and engage in daily occupations. Therapists and youth may work together to build on these personal and environmental insights to cocreate client-centered interventions that enable meaningful participation in restricted occupations and promote healthy habits that will persist into adulthood.

Regional Characteristics of Plantar Sensation in Developmental Coordination Disorder: A Comparative Study with Typically Developing Adults, Focusing on the first metatarsal head and Calcaneal

Authors:

Kanta KIMURA^{1,2}, ¹ Human Dynamics Laboratory, Department of Physical Therapy, Graduate School of Health Sciences, Aomori University of Health and Welfare, Aomori, Japan ² Department of Rehabilitation, Aomori Shintoshin Hospital, Aomori, Japan

Toshiya URUSHIHATA¹, ¹ Human Dynamics Laboratory, Department of Physical Therapy, Graduate School of Health Sciences, Aomori University of Health and Welfare, Aomori, Japan

Aoi NAGAI^{1,3}, ¹ Human Dynamics Laboratory, Department of Physical Therapy, Graduate School of Health Sciences, Aomori University of Health and Welfare, Aomori, Japan ³ Department of Rehabilitation, Hirosaki Kinen Hospital, Hirosaki, Japan

Daiki NISHIMURA⁴, Department of Rehabilitation, Sapporo Tokushukai Hospital, Sapporo, Japan

Background

Understanding sensory characteristics in developmental coordination disorder (DCD) is crucial for elucidating sensory integration and body perception. The plantar surface, particularly the first metatarsal head and calcaneal, is central to postural control. Studies have reported sensory hypoesthesia in DCD (Tseng et al., 2019) and greater sensory dullness in the heels of adults with typical development (TD) (Takemi et al., 2025). We compared plantar sensory thresholds between p-DCD and TD adults and examined regional differences between the first metatarsal head and calcaneal.

Methods

Based on BOT-2 scores, individuals with low motor proficiency

were considered p-DCD (n = 10); TD were controls (n = 20).

Plantar sensation was measured bilaterally using Semmes–Weinstein monofilaments. Each region was tested 10 times blind; thresholds were determined at 70% accuracy. Normality was confirmed using Shapiro–Wilk test. Split-plot ANOVA was performed, followed by Bonferroni correction (p < .05).

Results

Split-plot ANOVA revealed a significant main effect of group for both feet (right: $F(1,28) = 26.62$, $p < .001$; left: $F(1,28) = 12.81$, $p < .01$), with the p-DCD group exhibiting higher thresholds across regions. Contrastingly, the TD group showed lower sensitivity in the calcaneus than the first metatarsal head. A significant group $\times$ region interaction was observed for the left foot ($F(1,28) = 4.71$, $p < .05$).

Discussion

Adults with p-DCD exhibit a generalized reduction in plantar sensation. For the left foot, regional differences appeared in the TD group. Absence of interaction in the right foot suggests the lateral asymmetry reported in DCD (Zwicker et al., 2012). Region-specific sensory modulation occurred in TD, but was limited in p-DCD. Studies should integrate plantar pressure and motor control indices to clarify sensory–motor integration. Ethical approval was obtained from the Research Ethics Committee of Aomori University of Health and Welfare (No. 24030).

Is procedural perceptual-motor learning related to perceived and real motor levels in adults with and without Developmental Coordination Disorder?

Authors:

Sarah Seiwert, Univ Toulouse, Inserm, ToNIC, Toulouse, France
Elodie Martin, Univ Toulouse, Inserm, ToNIC, Toulouse, France
Joseph Tisseyre, Univ Toulouse, Inserm, ToNIC, Toulouse, France
Jessica Tallet, Univ Toulouse, Inserm, ToNIC, Toulouse, France

Introduction

Procedural Perceptivo-Motor Learning (PPML), which is essential for acquiring new motor skills, remains understudied in adults with DCD1. Therefore, it is unclear whether motor difficulties affect one or both types of PPML (i.e., sequence learning and visuomotor adaptation). This study aims to examine, through a continuum approach, whether each type of PPML is linked to perceived and/or real motor levels.

Methodology

80 adults (44 women, mean age: 24,49±7,87), including 10 with a DCD diagnosis, completed the Adult Developmental Coordination Disorder Checklist (ADC) and the Movement Assessment Batterie for Children, second edition (MABC-2) to assess the perceived and real motor levels. They then performed

two PPML tasks measuring motor sequence learning and visuomotor adaptation. Correlation analyses were conducted between (1) ADC and MABC-2 scores, and (2) between the learning scores for each task and the ADC and MABC-2 scores. Moderation analyses were then conducted to test the interaction between the ADC and MABC-2 scores on learning scores.

Preliminary results

Correlation analyses revealed that the MABC-2 and ADC scores were positively linked, and that the score of motor sequence learning was positively linked to the MABC-2 score. Moderation analyses revealed that MABC-2 scores positively predicted motor sequence learning only for lowest ADC scores.

Discussion and conclusion

Preliminary results suggest that real motor level predicts motor sequence learning only in individuals who have the lowest perceived motor level (particularly individuals with DCD). Further analyses will be conducted to better understand the role of perceived and real motor levels in PPML, particularly by investigating the implication of metacognition in PPML.
Reference.

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Cognitive Resource Reallocation during Procedural Learning in Adults with Developmental Coordination Disorder: Behavioral and EEG Evidence from a Dual-Task Paradigm

Authors:

Yuxuan Hu, 上海体育大学

Zuyang Fan, 上海体育大学

Junqi Li, 上海体育大学

Binn Zhang, 上海体育大学

Introduction

Developmental coordination disorder (DCD) is a neurodevelopmental condition that often persists into adulthood, yet the mechanisms supporting procedural learning at mature stages remain poorly understood. This study examined whether adults with DCD engage greater domain-general cognitive resources when acquiring procedural knowledge, particularly under conditions of increased task load.

Method

Across two experiments, we compared adults with DCD and typically developing (TD) peers on a 2521974020@sus.edu.cn serial reaction time task, implemented under single-task (Experiment 1) and dual-task (Experiment 2) conditions, while recording electroencephalography (EEG). Participants

in Experiment 1 included $N = 51$ ($DCD = 24$, $TD = 27$), and in Experiment 2 $N = 39$ ($DCD = 19$, $TD = 20$).

Result

Behavioral analyses showed comparable learning between groups in the single-task condition, but significantly reduced learning in the DCD group under dual-task demands. EEG time–frequency analyses revealed greater frontal beta power modulation in DCD participants during sequence acquisition in the dual-task condition, consistent with increased reliance on attentional and executive control processes.

Discussion

These findings suggest that, while procedural learning

performance in adults with DCD can approximate that of TD peers under minimal resource competition, dual-task contexts reveal a compensatory reallocation of cognitive resources. The results highlight the importance of considering task demands in both theoretical accounts and intervention strategies for DCD across the lifespan.

Sports participation in Autistic adults with and without Developmental Co-ordination Disorder (DCD/Dyspraxia)?

Authors:

Jennifer Snowball, Olga Tennison Autism Research Center

Dr. Simon Bury, Olga Tennison Autism Research Center

Dr. Daryll Archibald, University of Dundee

Prof. Alison Lane, Olga Tennison Autism Research Center

Introduction

Sports participation rates in Autistic and DCD people are comparatively lower than those without these conditions (Hillier et al. 2020, Steenbergen et al. 2020) potentially impacting health (Aitchison et al., 2020, Hallett, 2019). Cassidy et al. (2016) estimated ~20% of autistic adults also had DCD. No studies have examined how this impacts sports participation. The aim of this study is to compare sports participation between Autistic adults with and without DCD.

Method

This study used a cross-sectional online survey. 348 Autistic adult participants (Mage = 33.95, SD = 10.46; Male = 132, Female = 148, Non-binary (other) genders = 66). Responding to a survey of general demographics, motor diagnosis (e.g., DCD, cerebral palsy), the Adult Developmental Co-ordination

Disorder/Dyspraxia checklist - ADC-Q and questions regarding sports participation (yes/no) and sport type (individual/team).

Results

Four groups were established: DCD (n=148), other motor diagnosis (n=40), autism only (n=117) and probable DCD (n=43). Probable DCD was classified as ADC-Q cutoff (>65). There was a significant difference in participation, $\chi^2(3, N = 348) = 10.39$, $p = .02$, Cramér's $V = 0.16$. Post-Hoc tests showed that probable DCD participated significantly less than other groups. Significance was also found in the type of sport ($\chi^2(3, N = 294) = 8.52$, $p = 0.04$, Cramér's $V = 0.17$). DCD participants had the greatest participation in team sports (68.4%), while probable DCD participated the most in individual sports (95%).

Discussion/conclusion

Differences between groups were seen in sport participation and type. These unexpected findings may be explained by supports available to the formally diagnosed DCD compared to probable DCD. Further research is needed.

Perceived barriers, facilitators, and their associations with physical activity in adults with developmental coordination disorder

Authors:

Cindy Vu, RMIT University

Shahin Rahimi-Golkhandan, La Trobe University

Scott Ruddock, RMIT University

Introduction

Adults with Developmental Coordination Disorder (DCD) experience longstanding motor difficulties that may negatively impact physical activity (PA) participation. Although benefits and facilitators have been well researched in children with DCD, limited evidence exists for adults. This study examined perceived exercise facilitators and barriers among adults with DCD and investigated how these perceptions relate to PA behavior.

Methods

Adults aged 18–45 years ($N = 50$) with a diagnosis of DCD or score ≥ 65 on the Adult Developmental Coordination Disorder Checklist (ADC) were recruited to complete an online survey. Measures included demographic questions, the International Physical Activity Questionnaire–Short Form (IPAQ-SF), and the Exercise Benefits/Barriers Scale (EBBS). Pearson correlations were used to examine relationships between PA levels, ADC scores, and EBBS sub-scales.

Results

Participants reported low vigorous PA levels, high perceived benefits of physical activity, and moderate perceived barriers. Vigorous PA was moderately associated with perceived exercise benefits ($r = .49, p < .05$) and barriers ($r = .44, p < .05$). A small-to-moderate negative association emerged between ADC scores and vigorous PA ($r = -.34, p < .05$). ADC scores were not significantly related to perceived benefits or barriers.

Discussion

Psychosocial perceptions of exercise showed stronger associations with vigorous PA than motor severity. While greater motor difficulties were linked to lower PA, this relationship was notably weaker than those involving perceived benefits and barriers. It could be that motivational and contextual factors may be more strongly associated with determinants of PA behavior than motor capacity alone. These findings align with models

emphasizing self-efficacy and perceived control as determinants of PA participation. Interventions aiming to increase PA in adults with DCD may benefit from targeting psychosocial factors such as enhancing self-efficacy, addressing perceived barriers, and reinforcing the personal value of PA.

The usability of exergames to promote active living and participation among adolescents with developmental coordination disorder (DCD).

Authors:

Taha Yassine Tamlali, Radboud University

Bert Steenbergen, Radboud University

Jessica Lust, Radboud University

Sandra Klaperski-van der Wal, Radboud University

Introduction

Adolescents with probable developmental coordination disorder (p-DCD) are physically inactive. Exergames may help increase physical activity (PA); however, our previous review identified limited research on exergame use for PA in this population. The few existing studies suggested that exergames may positively influence PA through specific physical literacy (PL) domains. Understanding how adolescents with p-DCD perceive and evaluate exergames is important for designing acceptable, engaging exergame-based interventions to support PA.

Aims

To explore perspectives of adolescent participants with (p-)DCD regarding exergame use for PA.

Methods

Participants (N=103, age 12.48 (1.25)) completed an online questionnaire on PA, gaming habits and interest in exergames. A subsample (N=18) participated in semistructured interviews exploring their PA experiences, perspectives and recommendations regarding exergame use for PA promotion. Questionnaire data were summarized descriptively, and interviews were analyzed via thematic analysis, with themes mapped onto Cairney's PL framework.

Results

Most participants (58.3%) reported low PA, high sedentary time and frequent gaming. Although 43.7% believed exergames could help them be more active, 52.9% preferred sedentary games. Interviews described largely negative PA experiences related to low motivation and perceived competence, social exclusion and environmental barriers, yet most participants

expressed a wish to be more active. Adolescents felt exergames made real-world sport more accessible. They reported improved confidence and skill transfer to daily activities. Limitations for sustained engagement included the high physical load of exergames (motor competence), limited autonomy and content (motivation), limited enjoyment and social interaction (affective/social), and practical barriers such as space and cost.

Conclusion

Participants regarded exergames as a promising adjunct rather than a replacement for real-world PA. Participants' accounts highlighted the affective and social domains as particularly critical and underdeveloped in exergames. These user perspectives, interpreted through a PL lens, clarify how exergames could be adapted to better support PA in adolescents with p-DCD.

Resting-state functional connectivity and its relation to motor learning in adults with developmental coordination disorder

Authors:

Frederik J.A. Deconinck, Department of Movement and Sports Sciences, Ghent University, BE

Mireille Augustijn, Department of Movement and Sports Sciences, Ghent University, BE

Arthur De Raeye, Department of Movement and Sports Sciences, Ghent University, BE

Christian Hyde, School of Psychology, Deakin University, Melbourne, AUS

Valentine Chirokoff, School of Psychology, Deakin University, Melbourne, AUS

Jade-Jocelyne Zouki, School of Psychology, Deakin University, Melbourne, AUS

Introduction

Developmental Coordination Disorder (DCD) is characterised by persistent motor difficulties, yet the neural mechanisms underlying these deficits remain poorly understood. Cortico-subcortical-cerebellar circuits are critical for motor control and learning, and functional connectivity within these loops predicts motor learning capacity in typically developing individuals. However, this relationship has not been examined in adults with DCD. This study investigates (1) whether functional connectivity within cerebello-cortical and striato-cortical motor networks differs between adults with DCD and controls, (2) whether these patterns predict motor learning, and (3) whether connectivity changes differently per group following training.

Methods

Twenty-nine adults (16 with DCD, 13 controls; age 18–35) completed three resting-state fMRI scans (3T Siemens Prisma; gradient-echo EPI: TR = 2220 ms, TE = 24 ms, voxel size = 3 mm³, 60 slices, 240 volumes, ~8 min): at baseline, after a 6-week motor training protocol (three 30-min sessions/week) on a dynamic balance task using a rolla bolla, and following a 6-week retention period. Preprocessing included motion correction, normalisation to MNI space, and nuisance regression. Seed-based and whole-brain connectivity analyses targeted regions implicated in motor learning: primary motor cortex (M1), supplementary motor area (SMA), dorsal/ventral premotor cortex, basal ganglia (caudate), and cerebellar lobules III–VI. Performance was indexed by duration of independent balance across sessions. Connectivity metrics will be analysed as predictors of learning rate and to assess changes across training and retention using mixed-effects models. Results and

Results and Discussion

Data analysis is ongoing. We will present group differences in resting-state connectivity and their associations with motor learning outcomes, as well as training-related changes. Findings are expected to advance understanding of neural network contributions to motor learning in DCD.



Poster Session 2

Motor contributions to interpersonal synchrony in autistic children.

Authors:

MC. McQueen, University of Western Australia

MC. Macpherson, Macquarie University

L.K. Miles, University of Western Australia

SL. Reid, University of Western Australia

MK. Licari, The Kids Research Institute Australia

Introduction

From naturally walking in step to nodding in unison during conversation, people's actions often align in time and space. Termed interpersonal synchrony, this matching of behaviour shapes crucial social outcomes by fostering cooperation, communication and connection with others. Interpersonal synchrony emerges differently in autistic and neurotypical children, offering insights into distinct social experiences across neurotypes. One factor often overlooked in the emergence of interpersonal synchrony is motor impairment, a prevalent trait among autistic children. The present study aims to address this gap by examining the impact of motor skills on interpersonal synchrony among autistic and neurotypical children.

Methods

Neurotypical ($n = 43$) and autistic children without intellectual disabilities ($n = 47$) aged 7-16 years completed two rhythmic

motor tasks (finger tapping and reach-grasp-release ball sorting) alongside inanimate (metronome) or social (experimenter) 'partners' and under different task instructions (spontaneous or intentional). Regression models examined interpersonal synchrony as a function of motor impairment, adjusting for common covariates (e.g., autistic traits, attention).

Results

Preliminary analyses revealed less stable synchrony among autistic children than their neurotypical peers, as shown in previous literature. Notably, among autistic children, motor impairment did not predict spontaneous synchrony stability in nonsocial (metronome) or social (experimenter) contexts. In contrast, motor impairment was predictive of less stable intentional synchrony among autistic children regardless of 'partner' (metronome or experimenter).

Discussion

As data collection is ongoing, complete results will be presented at DCD 16. Present findings indicate that motor impairment may contribute to disruptions in intentional interpersonal synchrony among autistic children. While autistic children exhibited less stable synchrony overall, the link between motor impairment and less stable intentional synchrony highlights a potential motor influence on compensatory social mechanisms. The absence of this relationship in spontaneous contexts implies that unintentional interpersonal synchrony may depend on broader social-perceptual processes rather than motor skills.

The Relationship between Motor Performance, Physical activity and Quality of Life in School-Aged Children

Authors:

Oluwakemi A. Ituen, Department of Physiotherapy, University of Uyo Teaching Hospital, Uyo, Akwa Ibom state Nigeria

Background

The ability to perform motor skills is essential for activity participation. In school aged children motor proficiency plays a significant role in their academic and nonacademic activities. Interestingly, motor competence also enhances the development of social skills and interpersonal relationships. This implies that the level of motor function can have an overall effect on general well-being and Quality of Life (QoL) of the individual. The aims of this study were to identify the relation between Motor Skill level, physical activity level, functional difficulties and QoL.

Methods

The study employed a cross-sectional design and recruited 165 children, aged 7-9 years from nine primary schools in Uyo, Akwa Ibom, Nigeria. The participants were assessed using the PERF-FIT, the Pediatric Quality of Life Questionnaire, and the Child Activity Limitation Interview-21 and the Physical Activity Questionnaire. Children were divided into 3 groups (Motor skills above average, average and below average). The Kruskal-Wallis

test and the Spearman rho correlation test were used to analyze the data.

Results

Overall children with higher level of motor skills reported better QoL [H=7.099 (2,164), p=0.029]. The PAQ scores [H=2.182 (2,162), p=0.339] and the CALI-21 [H=5.798 (2,162), p=0.055] were not different between groups. However, correlations between motor skills and the other the tools were low (CALI-21 $r=-0.047$; PAQ $r=0.048$; QoL $r=0.126$). There was a weak (negative) correlation between function limitation and QoL ($r=-0.302$, $p=0.001$), weak correlation between physical activity and QoL ($r=0.24$, $p=0.001$).

Conclusion

Children with higher motor competence demonstrated significantly better quality of life, reinforcing the importance of motor skill proficiency in promoting overall well-being. The weak but significant negative correlation between functional

limitation and quality of life suggests that increased activity restrictions are associated with poorer wellbeing.

The Effect of Sibling on Motor Development in Preschoolers of China: Mediating Effects of Sleep Quality

Authors:

Meiqin Wu, Shanghai Key Laboratory of Maternal Fetal Medicine,
Department of Women's and Children's Health Care,
Shanghai First Maternity and Infant Hospital,
School of Medicine, Tongji University,
Shanghai 201204, China

Jing Hua, Shanghai Key Laboratory of Maternal Fetal Medicine,
Department of Women's and Children's Health Care,
Shanghai First Maternity and Infant Hospital,
School of Medicine, Tongji University,
Shanghai 201204, China

Introduction

Children with developmental coordination disorder (DCD) exhibit severe motor clumsiness that interferes with academic achievement and the activities of daily living. Sleep problems are associated with impaired neurobehavioral performance. This study explored whether sleep quality (measured via Children's Sleep Habits Questionnaire, CSHQ) mediates the link between sibling status (only child, older child with younger siblings, younger child with older siblings) and suspected DCD risk (assessed via LDCCDQ) in Chinese children, considering the one-child policy's impact on family structure.

Methods

We used baseline (cross-sectional) data from the Chinese National Cohort of Motor Development (CNCMD) study

of 201,501 preschoolers. The outcome of interest was motor development of preschoolers, which was assessed using the LDCCDQ. Sleep quality was captured by the CSHQ. A mediation model was tested to examine whether CSHQ scores mediated the relationship between sibling status (reference: only child) and LDCCDQ scores. Bootstrap resampling was used to estimate 95%CI for indirect effects. All statistical analyses were performed using R statistical software version 4.4.2.

Results

A total of 122,035 valid samples were retained after data preprocessing including only children 70205, older children 20317, and younger children 31513. Mediation analysis shown that: (1) Older ($\beta = -0.172$, $p < 0.001$) and younger ($\beta = -0.752$, $p < 0.001$) children had lower CSHQ scores than only children;

(2) Lower CSHQ scores correlated with higher LDCCDQ scores ($\beta = -0.248$, $p < 0.001$); (3) Sleep quality mediated the relationship: indirect effects were significant for older (0.043, 95% CI [0.014, 0.072]) and younger children (0.186, 95% CI [0.159, 0.212]), with small standardized effects (0.005 SD, 0.021 SD vs. only children).

Conclusions

Sleep quality partially mediates sibling status-suspected DCD risk. Non-only children (especially younger siblings) have better sleep but higher DCD risk, highlighting sleep as an intervention target. The findings also provide empirical insights into how family structure relates to child motor and sleep development.

Effects of Ball Skill Interventions for Core Symptoms in Children with Developmental Coordination Disorder: A Network Meta-Analysis

Authors:

Zisu WANG, Department of Sports Science, Zhejiang University

Yu Jie Jane, Department of Sports Science, Zhejiang University

Objective

For children with DCD, ball skills training offers multi-faceted benefits, potentially enhancing motor coordination, cognitive function, and social participation. However, the optimal design of such interventions for maximizing core motor proficiency on the standard MABC-2 assessment remains unclear. This network meta-analysis therefore directly compares different ball skill-based approaches to identify the most effective strategy.

Methods

A systematic search of five databases from inception to July 29, 2025, identified 2,476 records. After screening, nine studies (involving 350 participants) were included for quantitative synthesis.

The active interventions were classified into three nodes:
B) Sport-specific ball sports (2 studies), e.g., basketball/table tennis;
C) General motor skill training with ball skills (5 studies), e.g.,

integrating catching/throwing into broader exercises; and
D) VR ball-game simulations (2 studies);
with A) Usual care as the control.

The control groups, designated as Group A, were comprised of individuals with DCD. A frequentist network meta-analysis was performed using Stata.

Results

Statistical models detected no significant inconsistency in the entire network ($p = 0.807$). All active interventions demonstrated significant improvements in MABC-2 scores compared to usual care. The estimated between-studies standard deviation was 7.24, indicating moderate heterogeneity.

Probability rankings established a clear efficacy hierarchy: multimodal interventions containing ball skills (C) had a 64.4% probability of being best, followed by ball skill-only training (B) at 17.9%, and VR ball games (D) at 17.6%.

Furthermore, intervention C had a 90.7% cumulative probability of being first or second best, while intervention A (usual care) had a 62.2% probability of being worst. These probabilities respectively represent the chance of being top-ranked (64.4%) and the high certainty of being among the top two (90.7%), underscoring the robust superiority of intervention C.

Conclusion

To improve motor function in DCD, clinicians should prioritise multimodal interventions incorporating ball skills. Focused ball training or VR games are recommended alternatives.

Co-Design Protocol for the ModiSchool Intervention Study Enhancing Motor Competence, Health-Related Fitness, and Psychosocial Wellbeing in Children with Motor Difficulties

Authors:

Terhi Huovinen, University of Jyväskylä
Mikko Huhtiniemi, Assistant Professor
Anni Pohjanvirta, University Teacher
Eero Lapinkero, PhD candidate
Ida Mälkönen, Researcher

Teatske Altenburg, Associate Professor
Claudia Dictus, PhD candidate
Helena Viholainen, Lecturer
Tuija Tammelin, Chief researcher
Piritta Asunta, Chief specialist

Introduction

Motor difficulties, such as Developmental Coordination Disorder (DCD), affect many children yet often remain underrecognized, leading to adverse physical, academic, and psychosocial outcomes. The MoDiSchool research project aims to address this issue by codesigning a school-based intervention to enhance motor competence, health-related fitness, and psychosocial wellbeing in children with motor difficulties. The co-design process has two aims: (1) to design, refine, and evaluate pedagogical practices that promote motor development in everyday learning contexts, and (2) to plan strategies for effective implementation within school structures.

Methods

Co-design approach will be informed by the Consolidated Framework for Implementation Research (CFIR) and design-based research principles. The process emphasizes iterative development and stakeholder involvement through participatory methods appropriate to their roles and varying levels of engagement. It integrates professional expertise with endusers' experiences while drawing on evidence-based approaches shown to support motor skill development in children with DCD. The stakeholders will comprise a) ten teachers, for whom six online workshops will be organized; b) two classes of 40 pupils aged 7–8 years, who will participate in one face-to-face workshop; c) their guardians, who will attend one meeting; and d) 5–10 school principals, who will join one online workshop. Data will be collected through audio-recorded focus groups,

observation diaries, and hand-drawn and written materials. Analyses will employ qualitative approaches, such as thematic and content-oriented techniques as well as frame analysis, to explore experiences, meanings, and variations in stakeholder perspectives.

Results and Conclusions

By engaging multiple stakeholders and applying implementation science frameworks, the study aims to ensure contextual relevance, feasibility, and sustainability. Data collection for the co-design phase will occur in spring 2026, and preliminary findings will be presented at the DCD-16 conference. Findings from this co-design phase will inform a subsequent cluster randomized controlled trial and contribute to evidence-based practices for inclusive education.

Development, Reliability and Validity of the Japanese version of DCDDaily-Q

Authors:

Takuya Higashionna, Department of Rehabilitation, Faculty of Health Sciences, Tokyo Kasei University, Japan

Haruka Noda, LITALICO Inc., Japan

Yuto Iwanaga, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University, Japan

Yoko Yamanishi, Department of Occupational Therapy, Graduate School of Human Health Sciences, Tokyo Metropolitan University, Japan

Mitsuki Ozaki, Faculty of Education, University of Miyazaki

Masaaki Sato, Department of Occupational Therapy, School of Health Sciences, Shinshu University, Japan

Marina M. Schoemaker, Department of Human Movement Sciences, University Medical Center Groningen, University of Groningen, Netherlands

Ryoichiro Iwanaga, Department of Occupational Therapy Sciences, Nagasaki University Graduate School of Biomedical Sciences, Japan

Introduction

In approaches for children with developmental coordination disorder (DCD), assessments that focus on activity and participation are essential. The DCDDaily-Q has been developed to evaluate the activities of daily living (ADL) of children with DCD (Berdien W et al., 2014). However, there is currently no Japanese version of the DCDDaily-Q. This study aimed to develop a Japanese version of the DCDDaily-Q and to examine its reliability and validity.

Methods

The Japanese version of the DCDDaily-Q was produced through forward translation, reconciliation, back translation, and expert review. A web-based screening survey was conducted to identify

parents of typically developing children aged 5–12 years, after which data for the Japanese version of the DCDDaily-Q were collected in the main survey. To assess structural validity, confirmatory factor analysis was conducted using the original three-factor model. Model fit was evaluated with the Satorra–Bentler corrected chi-square, CFI, TLI, and RMSEA, and internal consistency with Cronbach's α and McDonald's ω . This study was approved by the ethics committee of the first author's institution (SKE2023-15).

Results

Among 3,000 respondents to the screening survey, 265 participants were included in the analysis. The children's mean age was 8.5 years; 146 were boys and 119 were girls. The

confirmatory factor analysis demonstrated good model fit: corrected $\chi^2(227) = 520.769$, $p < .001$; CFI = .961; TLI = .956; RMSEA = .025. Both Cronbach's α and McDonald's ω were above .80, indicating good internal consistency.

Discussion/Conclusion

The Japanese version of the DCDDaily-Q was shown to retain the original 23-item, threefactor structure. The findings indicate that the Japanese DCDDaily-Q is a reliable and valid scale for assessing ADL among children aged 5–12 years. This tool is expected to be useful for evaluating activity and participation levels in children with DCD and for examining the effectiveness of related interventions.

Motor coordination and emotional–behavioural difficulties in children with congenital asymptomatic CMV infection at school age: Implications for DCD risk

Authors:

Ylenia Micci, Sapienza University of Rome, Italy

Michela De Cicco, Sapienza University of Rome, Italy

Carlo Di Brina, Policlinico Umberto I Hospital, Rome, Italy

Barbara Caravale, Sapienza University of Rome, Italy

Introduction

Asymptomatic congenital CMV (acCMV) infection has been suggested as a potential condition associated with subtle neurodevelopmental differences. Although children with acCMV show no clinical signs at birth, mild motor coordination difficulties may emerge later in childhood. Developmental Coordination Disorder (DCD) has been proposed as a possible downstream expression of early CMV-related brain vulnerability. This study examined motor coordination, emotional–behavioural functioning, and their associations in school-age children with acCMV.

Methods

Parents of 51 children with acCMV (33 boys, 18 girls; age 5–13 years, $M = 8.31$, $SD = 2.62$) completed the Developmental Coordination Disorder Questionnaire (DCDQ-IT) and the Strengths and Difficulties Questionnaire (SDQ). Children were classified as “at risk” or “not at risk” for DCD based on Italian

and Canadian cut-offs. Group differences in DCDQ and SDQ scores were examined using independent-samples t-tests and one-way ANOVAs. Pearson correlations assessed associations between motor coordination (DCDQ total and subscales) and emotional–behavioural dimensions (SDQ subscales).

Results

Across both cut-offs, 13.7% of children with acCMV were classified as “at risk” for DCD. This group showed significantly lower DCDQ scores ($p < .001$), with huge effect sizes ($d = 4.12$; $d = 3.50$). No gender differences emerged in DCDQ or SDQ scores ($p > .17$). Motor coordination was negatively associated with emotional symptoms ($r = -.35$), conduct problems ($r = -.31$), hyperactivity/inattention ($r = -.50$), and peer problems ($r = -.42$), and positively associated with prosocial behaviour ($r = .43$; all $p < .05$).

Conclusion

Children with acCMV may exhibit subtle yet meaningful motor coordination difficulties, along with challenges to emotional and social adjustment. Findings support the hypothesis of a neurodevelopmental continuum in which early acCMV-related vulnerability contributes to emerging DCD-like motor profiles and associated psychosocial difficulties. Early multidimensional screening may help identify children at risk and guide integrated motor–emotional interventions.

Developmental coordination disorder research in Asia Western Pacific region: scoping review

Authors:

Kathlynn F. Eguia, ThinkIDS, Quezon City, Philippines

Catherine M. Capio, Hong Kong Metropolitan University, Hong Kong SAR

Introduction

Despite developmental coordination disorder (DCD) being a common neurodevelopmental disorder, regional research remains limited and mostly come from higher-resource countries. Key gaps persist in characterising prevalence, assessment tools, and sociodemographic influences. Synthesizing regional evidence will improve understanding, highlight research gaps, and guide culturally relevant screening and intervention approaches. This review maps and synthesises evidence on the prevalence, assessment approaches, and sociodemographic contexts of DCD among children and adolescents in the WHO Asia Western Pacific region (AWPR).

Methods

This review followed the JBI methodology, and information sources include PubMed, CINAHL, Embase, Web of Science, Cochrane databases, and relevant gray literature. The initial search was restricted to English. Eligible studies

involved children and adolescents diagnosed or assessed for DCD, reported prevalence, assessment approaches, or sociodemographic factors, and were conducted in any AWPR territory. Two reviewers independently selected studies and resolved inconsistencies by consensus. Data were extracted using a standardized charting form and presented descriptively, highlighting trends and gaps across countries and topics, in line with JBI and PRISMA-ScR guidance.

Results

Forty-six studies were identified across 11 countries. China (n=9) and Japan (n=8) contributed most, followed by Taiwan (n=6), Australia (n=5), and South Korea (n=4). Studies focused on prevalence (n=14), assessment approaches (n=26), and sociodemographic factors (n=21). Reported prevalence ranged from 4% to 12.77%. Research was concentrated in high-income economies, with no studies from the Philippines, Cambodia, Mongolia, Papua New Guinea, or Pacific Island nations.

Conclusions

DCD research is concentrated in high-income AWPR nations, with substantial gaps in lower-income countries and island states. Heterogeneous assessment tools and prevalence estimates highlight the need for standardised, culturally adapted screening. Future research should prioritise underrepresented regions to develop contextually relevant interventions and reduce disparities in DCD identification and management.

Motor Profiling in Children with Autism Spectrum Disorder (ASD)

Authors:

Miss Yeung Tsz Yu, Mr Yuliang Wang, Mr Timothy Tang, Miss Felix He, Miss Charlie Fan, Prof Wan Yee Winnie Tso,
University of Hong Kong

Background

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that is characterized by repetitive behaviors and poor social skills. Early developmental assessment with standardized scales can be used to determine the motor, cognitive and social milestones of children. There are limited studies investigating the developmental profiles and motor trajectories of children with ASD.

Objectives

To investigate and compare the motor skills of children with ASD against their social, language and cognitive abilities.

Methods

The developmental profiles of children with ASD were reviewed at a child assessment centre over 2 time points. 120 children aged 2-7 years (mean age at assessment: 32.4 months SD = 10.3 months) diagnosed with ASD were included. The chronological age at the time of assessment and the age-equivalent scores from

the initial Griffiths Mental Development Scales = Extended Revised (GMDS-ER) were obtained. Repeated measures ANOVA was performed, to compare the developmental delay of ASD children across the five GMDS-ER domains (A-E).

Results

Language skills had the greatest delay (Mean = 14.96 months, SD = 9.72 months), followed by personal and social skills (Mean = 11.5 months, SD = 8.71 months), eye-hand coordination (Mean = 9.17 months, SD = 7.89 months), cognitive performance (Mean = 7.64 months, SD = 8.67 months), whereas Locomotor skills were least affected delay (Mean = 7.02 months, SD = 7.15 months). Significant variations in the developmental profiles of children with ASD were observed when comparing within-subject developmental delay across the five sub-scales ($p < .001$).

Conclusions

Overall, our findings showed that ASD children were most at risk of language delay, followed by poorer social, eye-hand

coordination, and cognitive performance. Although children with ASD had lower risk of gross motor delay, their motor milestones might have significant variations among children with ASD. Hence, it's important to formulate a personalized rehabilitation plan for children with ASD.

Effectiveness of motor coordination items for screening neurodevelopmental disorders

Authors:

Ryoichiro Iwanaga, Graduate School of Biomedical Sciences, Nagasaki University

Nanako Hironaka, Graduate School of Biomedical Sciences, Nagasaki University

Miyu Murata, Graduate School of Biomedical Sciences, Nagasaki University

Akiko Tokunaga, Graduate School of Biomedical Sciences, Nagasaki University

Akira Imamura, Graduate School of Biomedical Sciences, Nagasaki University

Introduction

Early screening for neurodevelopmental disorders (NDDs) is critically important. In Japan, the Children and Families Agency aims to implement a nationwide 5-year-old health check by 2028. To improve the accuracy of this health check, the development of effective screening methods is essential. Previous research has shown that many children with NDDs exhibit motor coordination difficulties. Therefore, incorporating questionnaire items related to motor coordination may enhance screening accuracy. In this study, we identified motor coordination questionnaire items—developed by our research group—that effectively discriminate between 5-year-old children with NDDs and typically developing (TD) children, and examined their discriminative accuracy.

Methods

Parents of 36 children aged 5 years 0 months to 5 years 11 months who had been diagnosed with autism spectrum disorder (ASD) completed a 29-item motor coordination questionnaire. Each item was rated on a five-point Likert scale. Data from the NDD group were compared with data from 36 age- and sex-matched TD children. Items that showed significant group differences were summed to create a total score, and its discriminative ability was evaluated.

Results

Significant group differences were observed for 19 items. When a total score of ≥ 30 on these items was used as the cutoff for being at risk, the sensitivity was 0.75 and the specificity was 0.83, with an AUC of 0.850.

Conclusions

Although the sensitivity was not sufficiently high, the AUC indicated excellent discriminative ability when using the total score from the 19 items that showed significant differences between the NDD and TD groups. These findings suggest that motor coordination-related questionnaire items may enable the identification of NDD risk in 5-year-old children with good accuracy. Therefore, motor coordination items may be useful as supplementary components of the 5-year-old health check.

The effects of physical inactivity and obesity on internalising problems in children with Developmental Coordination Disorder over time: Evidence from the CATCH study

Authors:

Noah Erskine, The University of Queensland

John Cairney, The University of Queensland

Matt Kwan, Brock University

Introduction

Children with Developmental Coordination Disorder (DCD) experience elevated rates of internalising problems, yet the underlying mechanisms contributing to these emotional difficulties remain poorly understood. Guided by the Environmental Stress Hypothesis (ESH), this study examined whether physical inactivity and obesity exacerbate internalising problems across early childhood, and whether these pathways differ across levels of motor impairment.

Methods

Participants were 429 children aged 4–5 years from the CATCH study, including 53 with DCD (41 boys, 12 girls), 96 at risk for DCD (rDCD; 65 boys, 31 girls), and 280 typically motor developing (TMD; 144 boys, 136 girls). Children were assessed annually over four years. Motor skills were measured using

the Movement Assessment Battery for Children–2nd Edition (MABC-2), physical inactivity via waist-worn accelerometers (average daily minutes of MVPA), obesity using age- and sex-standardised zBMI scores, and internalising problems using the Child Behavior Checklist (CBCL). Multi-group cross-lagged panel models tested longitudinal associations among physical inactivity, obesity, and internalising problems across the DCD, rDCD, and TMD groups.

Results

Physical inactivity demonstrated significant prospective associations with internalising problems in the rDCD group, with lower MVPA predicting higher later internalising symptoms. In contrast, obesity exhibited a strong early effect on internalising problems among children with DCD, suggesting heightened vulnerability linked to elevated weight status at

school entry. Cross-lagged pathways in the DCD group were more complex and bidirectional than those observed for rDCD and TMD children, indicating dynamic interactions among physical health and emotional functioning when motor difficulties are severe.

Discussion/Conclusion

Findings support the ESH and show that physical inactivity and obesity intensify internalising problems in young children with motor difficulties. These results emphasize the need for early, holistic interventions targeting both physical health and emotional wellbeing in children with DCD.

A feasibility study of a 10-week bespoke interactive motor skills and mentoring programme focusing on hand skills and body strength.

Authors:

Rosaline Van de Weyer, Anglia Ruskin University, UK

Sarah Van de Weyer,

Dr Luca Buzzatti,

Professor Catherine Coelho,

Introduction

A new therapeutic intervention has been developed to improve motor skills “Move Better, Live More”© (MBLM). This programme was developed as there are few cost effective, evidenced based therapy programmes for hand skills and body strength, for people reporting motor challenges. MBLM is evidence based, delivered via a workbook with video guidance and online mentoring. A specialist Occupational Therapy assessment for Developmental Coordination Disorder (DCD) with a learner studying dentistry, inspired this feasibility study, given an intervention was required to enhance fine motor skill proficiency. The study population were Year 1 Dental Therapy participants at the University of Plymouth Peninsula Dental School, UK.

Methods

There was purposive sampling for participants with a pre-

disclosed diagnosis of Developmental Coordination Disorder (DCD) but as these numbers were low, the sampling was extended to all the study population. The sample size was not limited. Sixteen participants were recruited by the dentistry school. The following outcome measures were selected: Motor Assessment Battery for Children Checklist 3rd Edition (2023) and the Canadian Occupational Performance Measure (5th edition 2014). These were completed pre- and post-delivery of the 10-week motor skills programme “Move Better, Live More” ©. These tools are designed to capture a client’s self-perception of performance in everyday living, over time. Up to 3 sessions of online mentoring were offered to all participants over the 10-weeks.

Results

The Movement ABC checklist indicated overall significant change scores in perceived motor skill abilities, following

participation in the “Move Better, Live More” © 10-week programme. The Canadian Occupational Performance Measure indicated that most participants scores improved, in relation to their perceived abilities and satisfaction of hand manipulation skills, bilateral hand skills, balance, posture and emotional well-being.

Conclusion

This feasibility study indicates that the MBLM programme merits further research as an intervention for people with diagnosed or suspected Developmental Coordination Disorder (DCD).

Gross motor interventions improve coordination, visual perception and mental health in children with traits of neurodevelopmental disorders

Authors:

Takahiro OTSUBO, Itami Municipal Itami Special Needs Education School

Tomochika FUKUNISHI, Rehabilitation Development Support Room UT Kids Plus

Kunie TOZA, After-School Daycare Center Entrance Every

Akio NAKAI, Research Institute for Education, Mukogawa Women's University

Introduction

Visuospatial cognitive abilities are essential not only for cognition and motor skills but also for academic skills and learning. Approximately 50% of children with developmental coordination disorder (DCD) show visuospatial difficulties, and nearly 88% struggle with arithmetic. Although previous studies have explored how gross motor interventions influence fine motor skills in children with DCD traits, no study has examined their impact on visual perception, using the WAVES assessment, a tool developed and standardized in Japan.

Purpose

This study aims to examine the effects of a gross motor-focused intervention on coordination, visual perception, and mental health.

Methods

Participants included 14 children (aged 7–10) with neurodevelopmental traits attending after-school day services and their parents. The movement intervention program selected activities from the Elementary School Curriculum Guidelines for Physical Education (MEXT, Japan). Sessions were 45 minutes long, once a week, for 8 weeks. The MABC-2, WAVES, DCDQ, and SDQ were administered before and after the intervention. The study was approved by the Ethics Committee of Research Institute for Education, Mukogawa Women's University.

Results

The intervention resulted in improvements in the MABC-2 “manual dexterity” and total scores, and in the WAVES “Visual Perception” and “Visual Perception + Eye-Hand Coordination” scores. Furthermore, among children below the 5th percentile on the MABC-2 “total” (n=8), improvements were also seen in SDQ “conduct” and “total difficulties” subscales.

Discussion

This study demonstrates that a gross motor-focused intervention for children with neurodevelopmental traits improves coordination, especially fine motor skills, and visuospatial abilities. Furthermore, for children with DCD, it also improves mental health. Fine motor skills and visuospatial cognitive abilities are closely related and influence mathematical skills. The feasible exercise program for school settings suggests potential benefits not only for children with neurodevelopmental traits but for all children.

Preliminary Outcomes of Virtual Reality-based Exergame on Cardiorespiratory Fitness in Children with Developmental Coordination Disorder

Authors:

YA-JU JU, Department of Physical Therapy, China Medical University

Po-Sen HuKao, Landseed International Hospital

Rong-Ju Cherng,

Introduction

Children with developmental coordination disorder (DCD) often demonstrate reduced cardiorespiratory fitness (CRF), elevated resting heart rates, and low engagement in moderate-to-vigorous physical activity, limiting their participation in traditional aerobic exercise. Virtual reality (VR) based exergames have emerged as a promising way to promote physical activity, offering immersive and motivating environments that may improve adherence. Aerobic exercise is known to enhance CRF, and the interactive nature of VR may further support ongoing participation. This study investigated the preliminary effects of a VR-based exergame on CRF in children with DCD.

Methods

Thirteen children with DCD, aged 6 to 9 years, were enrolled. All had typical neurological, musculoskeletal, and cardiopulmonary status. DCD was diagnosed using DSM-5 criteria, and the Movement Assessment Battery for Children, Second Edition (MABC-2), with scores at or below the 16th percentile indicating significant difficulties. Participants completed an eight-week VR-based aerobic intervention with a standardized warm-up, structured aerobic exercise, and cooldown. Primary outcomes included estimated maximal oxygen uptake (VO_2max) and pulmonary function indices, specifically, forced expiratory volume in one second (FEV1) and forced vital capacity (FVC).

Results

After the intervention, participants showed a significant improvement in estimated VO_2max , indicating enhanced aerobic capacity. No significant changes in FEV1 or FVC were observed, suggesting that pulmonary function remained stable during the training period.

Conclusion

The VR-based exergame improved estimated VO_2max in children with DCD, highlighting its potential as an engaging and feasible strategy for enhancing CRF. While pulmonary function indices did not change significantly, the increase in aerobic capacity demonstrates the promise of VR-supported exercise. Further research with larger samples, varied training intensities, and longer durations is needed to fully assess the impact of VR-based training on CRF and respiratory outcomes.

Co-producing a Manualised Version of the Cognitive Orientation to Daily Occupational Performance Intervention for Handwriting – CO-OP Write

Authors:

Dr Mellissa Prunty, Health Research Institute (HRI), University of Limerick, Limerick, V94 T9PX, Ireland

Professor Helene Polatajko, Department of Occupational Science and Occupational Therapy, Rehabilitation Sciences Institute, University of Toronto, Canada

Introduction

The Cognitive Orientation to Daily Occupational Performance (CO-OP) is an established and effective intervention for supporting participation in children with Developmental Coordination Disorder. In a recent review of the use of CO-OP in children with disabilities, the skill of handwriting emerged as the most frequently reported goal for therapy. While CO-OP has traditionally required specialist training and delivery, there may be scope for adapting the intervention specifically for handwriting to enable wider use by parents, occupational therapists and occupational therapy students. The aim of this study was to undertake a structured process to co-produce a manualised CO-OP intervention for handwriting (CO-OP Write) for off-the-shelf implementation.

Methods

World Café discussions were used as a co-production method. Stakeholders including parents, occupational therapists and occupational therapy students participated in small-group conversations to review the proposed intervention and collaboratively shape the language, structure and delivery. Draft materials were progressively refined across cycles of discussion and feedback. Fidelity to the principles of CO-OP and stakeholder comprehension of key procedures and steps were systematically explored. The degree of scaffolding required to deliver the core components of CO-OP Write and the amount of information needed for initial implementation were also examined.

Results

Co-production using the World Café method guided the development of CO-OP Write. As this work reflects the development phase, results from piloting and evaluation are not yet available. However, the iterative process of stakeholder feedback will be reported.

Discussion/Conclusion

Manualising CO-OP for handwriting may enable parents to support their children at home. It may also support occupational therapists and their students in building capacity around targeted interventions for handwriting in school-based settings. This study outlines the first step in the development process.

Does physical activity mediate the relationship between motor difficulty and depression?

Authors:

Bo Shen, Central China Normal University

Jin Bo, Eastern Michigan University

Introduction

Motor coordination difficulties are linked to psychosocial challenges across the lifespan. The Environmental Stress Hypothesis (ESH) proposes that motor impairments increase exposure to repeated performance-related, social, and emotional stressors, elevating risk for internalizing problems such as depression. Although reduced physical activity has been proposed as a potential mediator in this pathway, evidence in adults remains limited. This study examined relationships among motor difficulties, physical activity, and depressive symptoms in college-aged adults and tested whether physical activity mediates the association between motor ability and depression.

Methods

Fifty-two adults ($M = 20.9$, $SD = 4.2$) completed the Adult Developmental Coordination Disorders/Dyspraxia Checklist (ADC), the PROMIS 1.0 Depression form, and the International Physical Activity Questionnaire (IPAQ). Participants scoring below 57 on the ADC were classified as showing possible

Developmental Coordination Disorder (DCD). Correlations, group comparisons, and a mediation analysis using PROCESS Model 4 were conducted.

Results

Nine participants met the criteria for possible DCD. Individuals classified as having possible DCD reported significantly higher depressive symptoms than those without ($t = 2.31$, $p < .05$). Correlational analyses indicated that greater motor difficulties were associated with higher depression scores ($r = .46$, $p < .05$). There was no significant relationship between physical activity levels and either ADC scores or depression. In the mediation model, ADC scores significantly predicted depression (direct effect), but physical activity did not mediate this association, as the bootstrapped indirect effect was nonsignificant.

Discussion/Conclusion

Consistent with the ESH, adults with greater motor difficulties

demonstrated higher depressive symptoms. The lack of mediation by physical activity suggests that psychosocial stressors, rather than activity levels, may play a more central role in linking motor impairments to emotional outcomes in adulthood. These findings highlight the importance of evaluating mental health in individuals with motor difficulties and underscore the need for further investigation into non-physical activity mechanisms underlying these associations.

Physical activity mediates the relationship of motor coordination with positive affect in children with probable DCD

Authors:

Kathlynn F. Eguia, ThinkKIDS, Quezon City, Philippines

Sum Kwing Cheung, The Education University of Hong Kong

Kevin K.H. Chung, The Education University of Hong Kong

Catherine M. Capió, Hong Kong Metropolitan University

Introduction

In children with developmental coordination disorder (DCD), poor motor coordination affects daily functioning and wellbeing, and physical activity (PA) participation tends to be limited. Although PA is positively associated with emotional wellbeing, studies exploring the connections between PA, wellbeing, and motor coordination in the context of DCD are limited. This research examines the relationships between motor coordination, PA participation, and wellbeing in children with probable DCD.

Methods

This secondary data analysis used a cross-sectional survey of Hong Kong parents of children aged 5–12 years (mean age 8.49, SD 2.19; $n = 654$). The survey included the Developmental Coordination Disorder Questionnaire-Chinese version (DCDQ-C) for parent-reported motor coordination and parent-

proxy Patient Reported Outcome Measurement Information System scales for PA and positive affect. Correlations were followed by mediation analyses to assess direct and indirect (via PA) effects of motor coordination on positive affect.

Results

DCDQ-C scores identified 18.35% ($n=120$) as probable DCD (pDCD). Motor coordination and positive affect were correlated in pDCD and non-DCD (nDCD) children ($p's < 0.05$). For pDCD, the total effect of motor coordination on affect was significant ($\beta=0.260$, $p=0.007$). The direct effect was not significant ($\beta=0.115$, $p=0.178$), the positive indirect effect via PA was significant ($\beta=0.146$, $p=0.002$), indicating full mediation. For nDCD, the total effect of motor coordination on affect was significant ($\beta=0.260$, $p<0.001$). The direct effect was significant ($\beta=0.253$, $p<0.001$), but not the indirect effect via PA ($\beta=0.007$, $p=0.187$), showing no mediation.

Conclusion

PA, which is known to contribute to wellbeing mediates the relationship between motor coordination and positive affect in pDCD children. These results highlight PA opportunities as important contexts for motor interventions for pDCD children. PA stands to facilitate enhanced wellbeing as motor coordination improves among children with pDCD. These theoretical relationships may be tested through intervention research.

Machine learning classification of children with probable developmental coordination disorder from their hand movement joint kinematics: an exploratory study

Authors:

Quting HUANG, Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China

Hei-Ying Wong, Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China

Chi-Wen Chien, Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong (SAR), China

Introduction

Developmental coordination disorder (DCD) is associated with impaired multi-joint coordination, yet clinical differentiation rarely uses multivariate kinematic patterns. We therefore examined whether supervised deep learning models can classify children with DCD from children with typical development (TD) using joint motion during hand movements.

Methods

Sixty children (n=34 for TD, n=26 for DCD) performed complex object rotation in an upright posture, and their hand movements were recorded using Vicon system. Model inputs were normalized time-series joint displacement data from twelve degrees of freedom of the fingers and thumb. Labels of TD/DCD were derived from children's performance on the in-hand manipulation subtest of a Hong Kong Fine Motor

Test. Data were randomly split into training (70%) and test (30%) sets with approximately balanced group proportions, and model performance was evaluated across ten iterations. Two supervised deep learning models were trained for group classification: a convolutional neural network (CNN) and a recurrent neural network with long short-term memory (LSTM) units. Performance was quantified using classification accuracy, the confusion matrix, and the area under the receiver operating characteristic curve (AUC).

Results

Across ten iterations, mean classification accuracy was 87.8% for the CNN and 81.1% for the LSTM (ranges: 77.8–94.4% and 66.7–88.9%). In the best iteration, both models showed good class separability (AUC=0.94 for both CNN and LSTM), with the CNN correctly classified 17 of 18 children (9 of 10 TD; 8 of 8

DCD) and the LSTM correctly classified 16 of 18 children (9 of 10 TD; 7 of 8 DCD).

Discussion/Conclusion

Deep learning applied to fine motor joint kinematic data can differentiate children with DCD from TD with high accuracy. Future work should increase sample size and incorporate a broader range of actions and task contexts to improve model generalizability and support robust classification across diverse movement demands.

Understanding motor inhibition among DCD children through interrupted gait initiation: Findings and implications from a pilot study

Authors:

Cheuk Yin HO, Department of Sports Science and Physical Education, The Chinese University of Hong Kong, Hong Kong

Cindy Hui Ping SIT, Department of Sports Science and Physical Education, The Chinese University of Hong Kong, Hong Kong

Yijian YANG, Department of Sports Science and Physical Education, The Chinese University of Hong Kong, Hong Kong

Introduction

Developmental coordination disorder (DCD) affects 5-6% of children, affecting their activities of daily living, such as self-care tasks, school activities and fundamental movement skills. DCD children exhibit greater gait variability, higher fall risk, and executive function impairments than their typically developing (TD) peers. Most previous studies assessed inhibitory control through cognitive tasks that might overlook the importance of motor inhibition. This study compared spatiotemporal and force characteristics during gait initiation tasks between DCD and TD children. It was hypothesized that DCD children would show altered parameters reflecting impaired motor planning and inhibition.

Methods

Four DCD and four TD children were recruited. Participants stood barefoot on a force plate and responded to randomized traffic-light signals on a screen. Ten “Go” trials required

immediate gait initiation on the green light; five “Go-&-Stop” trials required stopping within one step when the red light appeared 0.5-s later. Spatiotemporal (step time, step length) and force plate variables (APA onset/duration, peak centre-of-pressure excursions, propulsive impulse) were assessed. Group differences were examined using Mann-Whitney U tests.

Results

No significant differences were observed for either “Go” or “Go-&-Stop” trials. In “Go” trials, step time approached significance (DCD: 0.45 ± 0.06 s vs. TD: 0.36 ± 0.04 s; $p=0.057$, large effect size $r=-0.875$). Moderate-to-large effect sizes indicated trends toward slower APA, smaller anteroposterior centre-of-pressure excursion, and altered propulsive impulse in DCD children across both conditions.

Discussion/Conclusion

The absence of statistical significance is attributable to the small sample and DCD heterogeneity. Descriptive trends, however, align with prior evidence: DCD children adopted slower, more cautious gait-initiation strategies with prolonged APAs, and demonstrated deficits in motor planning and inhibitory control. These adaptations may enhance stability and reduce fall risk. With ongoing data collection for a larger sample, we envision novel findings that can inform targeted interventions for gait adaptations among DCD children.

Sensory and motor impairments in childhood apraxia of speech: evidence from a new cohort

Authors:

Şermin Tükel, Department of Physiotherapy and Rehabilitation, Izmir University of Economics, Izmir, Türkiye / Centre of Research Excellence in Speech and Language, Murdoch Children's Research Institute, Melbourne, Victoria, Australia

Lorraine O'Donnell, Centre of Research Excellence in Speech and Language, Murdoch Children's Research Institute, Melbourne, Victoria, Australia

Alicia Spittle, Department of Physiotherapy, The University of Melbourne, Melbourne, Victoria, Australia / Clinical Sciences, Murdoch Children's Research Institute, Parkville, Victoria, Australia

Angela Morgan, Centre of Research Excellence in Speech and Language, Murdoch Children's Research Institute, Melbourne, Victoria, Australia / Department of Audiology and Speech Pathology, University of Melbourne, Melbourne, Victoria, Australia

Introduction

Childhood Apraxia of Speech (CAS) is a motor speech disorder with a strong genetic component that affects the control and coordination of speech movements. Our previous research found that 63% of children with CAS screened positive for Developmental Coordination Disorder (DCD), as measured by a caregiver-completed questionnaire and visuo-motor performance test. In this study, we examine sensory and motor performance in a new group of children with CAS to determine which aspects are most affected.

Methods

We assessed 120 children with CAS (ages 3-11 years) using the Movement Assessment Battery for Children-Second Edition (MABC-2), a standardised tool for identifying DCD

and defining motor deficits. In addition, the Short Sensory Profile—a parent questionnaire measuring how children respond to sensory input—was used to identify sensory processing problems. Finally, standard cut-offs and descriptive statistics were applied.

Results

The MABC-2 revealed that 63% of participants fell within the clinical or at-risk range for DCD. Balance was the most impaired domain (64%), followed by manual dexterity (56%) and aiming/catching (31%). Definite sensory processing differences appeared in 61% of children. The most common issues included under-responsiveness (60%), auditory processing (58%), and low energy/weakness (53%). Additionally, taste/smell sensitivity (46%), tactile (43%), visual (34%), and movement (21%)

processing difficulties were observed.

Discussion/Conclusion

Cases of CAS frequently exhibit under-responsive sensory profiles (reduced sensitivity to sensory input), muscle weakness, and balance difficulties. These traits may reflect inefficiencies in vestibular-proprioceptive processing. Additionally, MABC-2 assessment of a new cohort confirmed the high prevalence of DCD in the CAS population. Notably, the clustering of motor and sensory impairments—especially difficulties with balance and sensory modulation (the regulation of responses to sensory stimuli)—underscores the need for early screening and intervention, given the future risk of psychiatric vulnerabilities associated with DCD.

Self-Efficacy Questionnaire for School-Aged Children with Developmental Coordination Disorder: Item Development

Authors:

Kazuko Kamijo, KURA ZEMI Co., Ltd., Japan

Keisuke Irie, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University, Japan

Yuto Iwanaga, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University, Japan

Kengo Fujiwara, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University, Japan

Takuya Higashionna, Department of Rehabilitation, Faculty of Health Sciences, Tokyo Kasei University, Japan

Mitsuru Kashiwagi, Department of Pediatrics, Hirakata City Hospital, Japan

Ryoichiro Iwanaga, Department of Occupational Therapy Sciences, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

Nan Liang, Clinical Cognitive Neuroscience, Advanced Occupational Therapy, Human Health Sciences, Graduate School of Medicine, Kyoto University, Japan

Introduction

Children with developmental coordination disorder (DCD) experience a decrease in self-efficacy, which is one factor associated with anxiety and depression. Currently, no childreport scale exists that assesses self-efficacy based on activities characteristic of DCD. As a first step in our research, we developed a set of questionnaire items to assess self-efficacy in school-aged (6-12) children with DCD.

Methods

We developed items based on the Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) methodology. First, assessments related to children's activities

were reviewed in the focus group. Next, we identified duplicate items and discussed whether each item was relevant to DCD. We selected 66 items, including unique items not found in existing assessments. Subsequently, cognitive interviews regarding item validity were conducted with seven experts who had over five years of clinical experience with children with DCD. The interviews focused on three aspects: 1) "Relevance": Whether the item relates to DCD symptoms or activities. 2) "Comprehensiveness": Whether the item broadly captures activities that children with DCD engage in. 3) "Comprehensibility": Whether questions about the item are easy for children with DCD to understand.

Results

Following cognitive interviews, 32 out of 66 items were selected as activities for assessing self-efficacy in children with DCD. The items cover activities at home, school, and in the community, and no additional items were proposed by the experts. Experts suggested that adding illustrations, explanatory text, and evaluation criteria would improve understanding.

Discussion/Conclusion

This questionnaire offers a novel insight by focusing on specific activities related to DCD. Children under the age of 10 tend to misjudge their own abilities because their metacognitive skills are not yet fully developed. Therefore, it is important to provide support and assistance to encourage appropriate self-assessment, especially in the case of children with DCD.

Development of a Typing Assessment Protocol (TAP)

Authors:

Anna L. Barnett, Oxford Brookes University

Nichola Stuart, Oxford Brookes University

Introduction

Many students with DCD find handwriting a challenge and struggle to keep up with the demands of class activities and handwritten examinations. Poor legibility can further impact on self-esteem and marks awarded for work. Typing/keyboarding is sometimes offered as an accommodation for those with handwriting difficulties. However, a lack of typing assessments for the English language makes it hard for practitioners to determine whether typing is a suitable accommodation. The aim of this study was to describe the development of a new Typing Assessment Protocol.

Methods

A questionnaire was circulated to practitioners involved in writing assessments to determine whether, why and how they assessed typing skill in students. Questionnaire responses, together with a literature review and pilot data, guided development of the TAP to measure the typing product, typing process and student perceptions of typing. Preliminary data are being gathered on two groups of adults aged 18-25 years, one

with and one without DCD. This includes informal feedback on the TAP design from students and assessors.

Results

Practitioner responses and the literature review confirmed the need for a typing assessment tool and the literature review suggested poor typing skill in students with developmental disorders, including DCD. Findings for the two groups will be reported from the three components of the TAP: (i) Product - typing speed and accuracy on a copying and a compositional task; (ii) Process - observations of the nature of visual monitoring and use of fingers on each hand, as reported by the assessor, and (iii) Perceptions – preference for typing over handwriting and perceptions of speed and accuracy in typing as reported in a student questionnaire.

Discussion

The results and informal feedback will be discussed and contribute to the evaluation and further development of the TAP. Next steps for further data collection will be outlined.

The co-occurrence of developmental coordination disorder and autism spectrum disorder traits increases the burden of poor quality of life in adults

Authors:

JORGE LOPES CAVALCANTE-NETO, Universidade do Estado da Bahia

Milena Lima Said, Universidade do Estado da Bahia

Ana Paula Fadul de Medeiros Torres, Universidade do Estado da Bahia

João Mateus Carneiro Silva, Universidade do Estado da Bahia

Sarah Moreira da Silva, Universidade do Estado da Bahia

Irla Pereira da Silva, Universidade do Estado da Bahia

Priscila M Tamplin, The University of Texas Arlington

Introduction

Although each neurodevelopmental disorder can negatively impact quality of life from childhood through adulthood, the co-occurrence of Developmental Coordination Disorder (DCD) and Autism Spectrum Disorder (ASD) may further increase this burden. However, few studies have compared quality of life between adults with and without DCD and ASD traits, particularly considering their co-occurrence in adulthood. Therefore, the objective of this study was to compare the perception of quality of life among adults with DCD traits, ASD traits, both DCD and ASD traits, and without any neurodevelopmental disorder traits (non-NDT).

Methods

One hundred and forty university students, aged 17-48 years ($M = 24.52$; $SD = 6.37$), of both sexes (70% female), participated in this study. Participants completed the ADC checklist, the Adult Autism Spectrum Quotient (ASQ) and the World Health Organization Quality of Life, short version (WHOQOL-BREF), to assess DCD traits, ASD traits and perceived quality of life, respectively. The total and domain scores of the WHOQOL-BREF were compared among adults with DCD traits, ASD traits, both DCD+ASD traits, and nonNDT using the Kruskal-Wallis test ($p < 0.05$).

Results

Participants with both DCD+ASD traits exhibited overall lower quality of life scores, with significantly lower scores than the non-NDT group in both total (Mean Rank = 47.41 vs. 76.81; $p = 0.043$), and physical domain (Mean Rank = 45.25 vs. 79.02; $p = 0.005$). In addition, the group with only DCD traits showed significantly lower scores in the physical domain compared to the non-NDT group (Mean Rank = 53.74 vs. 79.02; $p = 0.021$).

Discussion/Conclusion

Adults with DCD traits present poorer physical quality of life compared to their peers without any neurodevelopmental disorder traits. The burden increases when DCD traits cooccur with ASD traits, as this combination also affects overall quality of life.

Cortical involvement in postural control in children with developmental coordination disorder

Authors:

Antonella Iannotta, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute, Université libre de Bruxelles (ULB), Brussels, Belgium

Thomas Legrand, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences, Université libre de Bruxelles (ULB), Brussels, Belgium - School of Electrical and Electronic Engineering, University College Dublin (UCD), Dublin, Ireland

Scott J. Mongold, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute, Université libre de Bruxelles (ULB), Brussels, Belgium

Esratur Yildiran Carlak, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute, Université libre de Bruxelles (ULB), Brussels, Belgium

Christian Georgiev, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute, Université libre de Bruxelles (ULB), Brussels, Belgium

Pierre Cabaraux, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Department of Neurology, Hôpital universitaire de Bruxelles (HUB), Université libre de Bruxelles (ULB), Brussels, Belgium

Dorine Van Dyck, Department of Occupational Science & Occupational Therapy, University of British Columbia - Brain, Behaviour, and Development, BC Children's Hospital Research Institute, Vancouver, British Columbia, Canada

Gilles Naeije, Laboratoire de Neuroanatomie et Neuroimagerie translationnelles - Department of Neurology, Hôpital universitaire de Bruxelles (HUB) - Centre de Référence Neuromusculaire, Department of Neurology, CUB Hôpital Erasme, Université libre de Bruxelles (ULB), Brussels, Belgium

Marc Vander Ghinst, Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute - Service d'ORL et de chirurgie cervico-faciale, CUB Hôpital Erasme, Université libre de Bruxelles (ULB), Brussels, Belgium

Jennifer Foucart, Unité de recherche en Psychophysiologie de la santé et de la motricité humaine, Faculty of Human Motor Sciences, Université libre de Bruxelles (ULB), Brussels, Belgium

Nicolas Deconinck, Department of Neurology, Hôpital universitaire de Bruxelles (HUB), Université libre de Bruxelles (ULB), Brussels, Belgium

Mathieu Bourguignon, Laboratory of Functional Anatomy, Faculty of Human Motor Sciences - Laboratoire de Neuroanatomie et Neuroimagerie translationnelles, UNI – ULB Neuroscience Institute, Université libre de Bruxelles (ULB), Brussels, Belgium - WEL Research Institute, Avenue Pasteur 6, 1300 Wavre, Belgium

Cortical involvement in postural control in children with developmental coordination disorder

Introduction

Postural stability and balance control are well known to be impaired in children with developmental coordination disorder (DCD). As a consequence, DCD children are less stable than typically developing (TD) children. However, little is known about the cortical involvement in these processes. Such involvement could be quantified by assessing the coupling between cortical activity and force plate-measured postural sways, which is a form of corticokinematic coherence (CKC) previously reported in adults.

Methods

We recorded the center-of-pressure (CoP) fluctuations and electroencephalographic activity of 29 TD (8.4 ± 2.0 years, 13 females) and 11 DCD children (9.7 ± 2.1 years, 2 females) while they stood upright in four different conditions (eyes open or closed, on a hard surface or on foam pads) for a total of 2 minutes per condition, except in the eyes-closed-foam where they stood for 10 minutes. Postural instability was quantified with the standard deviation of the CoP in the antero-posterior direction and its mean velocity. CKC was assessed in the eyes-closed-foam condition only. It was quantified as the mean coherence in the 2-8-Hz range between each EEG signal and

1) CoP deviation from the mean, 2) CoP velocity, and 3) CoP velocity in absolute value.

Results

An ANOVA followed by post-hoc t-tests revealed that instability parameters were significantly higher in DCD children ($p < 0.05$), and increased with condition complexity ($p < 0.001$). Most importantly, although CKC was higher in TD compared with DCD children for all features, a Mann Withney test revealed that this difference was not statistically significant ($p = 0.15-0.43$ for the 3 CoP features).

Discussion/Conclusion

Even though our data confirm that DCD children have impaired static balance ability, it suggests that this difficulty is not due to altered cortical involvement in postural control. Still, more data are needed to fully confirm this hypothesis.

Dysfunction of the Autonomic Nervous System in Children with ADHD and Co-morbid DCD and its Association with Motor Impairments

Authors:

Jiaxin Chen, China Institute of Sport Science

Yanfeng Zhang, China Institute of Sport Science

Yanjie Chen, Beijing Children's Hospital, Capital Medical University

Haixia Hu, Weifang Aiyoudong Child & Adolescent Sports Health Institute

Deqiang Zhao, China Institute of Sport Science

Chunmiao Wang, China Institute of Sport Science

Objective

To investigate differences in Autonomic Nervous System (ANS) activity, measured by Heart Rate Variability (HRV), between children with ADHD and co-morbid Developmental Coordination Disorder (DCD) and typically developing (TD) children, and to analyze the association patterns between HRV indices and both motor function and symptom severity.

Methods

The study included 62 children (ADHD with DCD, N=29; TD children, N=33). Independent samples t-tests were used to compare group differences in the HRV indices SDNN and LF/HF ratio. HRV indices were log-transformed to correct for skewness. Pearson correlation analysis was employed to examine the relationships between the HRV indices and the total score

on the Movement Assessment Battery for Children (MABC) as well as symptom severity. Finally, HRV indices were entered into a regression model to test their predictive power for symptom severity.

Results

The ADHD with DCD group showed significantly lower SDNN (a marker of overall autonomic activity) compared to the TD group (MADHD=21.79 vs. MNormal=30.72, $t=3.054$, $P<0.01$), indicating reduced overall autonomic function. Concurrently, the ADHD with DCD group had a significantly higher LF/HF ratio (an indicator of sympathovagal balance) than the TD group (MADHD=4.34 vs. MNormal=2.60, $t=-2.467$, $P<0.05$), suggesting sympathetic overactivation or parasympathetic underactivity. Correlation analyses revealed a strong negative

correlation between symptom severity and lnSDNN ($r=-0.736$, $P<0.01$), and a positive correlation with lnLF/HF ($r=0.474$, $P<0.01$). Furthermore, lnSDNN showed a strong positive correlation with the MABC total score ($r=0.769$, $P<0.01$). The HRV indices lnSDNN, lnLF/HF, and lnRMSSD were all significant predictors of symptom severity (all $P<0.01$).

Conclusion

Children with ADHD and co-morbid DCD exhibit significant autonomic nervous system dysregulation, characterized by decreased SDNN and an elevated LF/HF ratio. This physiological dysregulation is highly correlated with symptom severity and is closely linked to motor function deficits, suggesting that ANS dysfunction may be a key component in the pathophysiology of ADHD co-morbid with DCD.

Decoding Fine-Motor Deficits in DCD: Contactless Kinematic Analysis Across Motor Competence Levels in Children

Authors:

Ruimin Li, Xidian University
Xin Yi, Xidian University
Yang Zheng, Xidian University

Jane Jie Yu, Zhejiang University
Hong Fu, The Education University of Hong Kong
Shuiping Gou, Xidian University

Background

A proportion of children with Developmental Coordination Disorder (DCD) experience difficulties in fine-motor control, yet research investigating quantitative kinematic patterns in fine-motor tasks remains limited. This study aims to uncover movement patterns during a peg-insertion task across different motor competence levels using a video-based kinematic analysis approach, thereby providing insights for identifying features associated with fine-motor deficits in DCD.

Methods

This study employed the peg-insertion task from the Movement Assessment Battery for Children (MABC-2) for children aged 7-10. A total of 110 participants completed the task, and their performance was captured using a Microsoft Azure Kinect sensor. Hand keypoints were extracted frame-by-frame using

MediaPipe Hand. Repetitive action segmentation and key-frame detection were used to identify the start and end of each peg-insertion cycle and the grasp-initiation frames. Kinematic features reflecting movement smoothness, stability, and grasp control were designed and extracted for comparative analysis.

Results

Data from 64 participants met inclusion criteria ($LMC \leq 16$ th percentile, $n=33$; $HMC \geq 50$ th percentile, $n=31$). Compared with the LMC group, the HMC group showed significantly greater wrist velocity ($p<0.0001$) and higher movement smoothness ($p=0.0003$). Measures of movement stability also indicated a smaller phase-space area ($p=0.0217$) and shorter phase-space length ($p=0.0136$) in the HMC group. In contrast, the LMC group exhibited larger hand openness ($p=0.0075$) and greater inter-finger distances during grasping ($p<0.05$), indicating more rigid grasp patterns.

Conclusions

Children with low motor competence demonstrated less smooth, less stable movement patterns, and more rigid grasp control. These findings provide insights that may inform the development of auxiliary diagnostic methods and fine-motor assessment task designs for DCD.



Verbal Session 7 -

Brain and Behaviour

Using EEG to measure cortical control of reactive balance recovery in children with DCD

Authors:

Griet Warlop, Department of Sport and Exercise Sciences, Manchester Metropolitan University
Callum Jarvis, Department of Sport and Exercise Sciences, Manchester Metropolitan University
Richard S. Mills, Department of Sport and Exercise Sciences, Manchester Metropolitan University
Toby J. Ellmers, Department of Brain Sciences, Imperial College London
Greg Wood, Department of Sport and Exercise Sciences, Manchester Metropolitan University
Aiden Payne, Musculoskeletal and Neurological Institute, Ohio University
Elmar Kal, Department of Health Sciences, Brunel University London
Samuel Wood, Department of Sport and Exercise Sciences, Manchester Metropolitan University
Sally Payne, Royal College of Occupational Therapists
Thomas O'Brien, Research Institute for Sport and Exercise Sciences, Liverpool John Moores University
Johnny Parr, Department of Sport and Exercise Sciences, Manchester Metropolitan University

Introduction

Children with DCD experience marked difficulties with balance and postural control, making them more vulnerable to falls and related negative health outcomes. Knowledge of underlying mechanisms remains limited. Research has identified a key neurophysiological response in balance recovery, the “balance N1”, expressed as a negative sensorimotor EEG potential occurring 100-200 ms following a postural disturbance. This postural ‘error signal’ is typically larger when recovery is more challenging, whether due to larger or unexpected perturbations or poorer intrinsic balance ability. However, in some clinical populations, or when engaged in a secondary dual-task, the size and speed of the balance N1 can become impaired, and balance suffers. This study investigates how children with DCD differ from TD counterparts in processing balance perturbations,

focusing on balance N1 and its modularity under varying conditions.

Methods

Data collection is ongoing. EEG will be recorded from 30 children with and 30 without DCD. Each child will stand on a treadmill that will suddenly move forwards a short distance to deliver backwards-falling postural perturbations. The amplitude and latency of balance N1 will be analysed across 72 perturbations of unpredictable timing, capturing responses to initial exposure and modulations based on trial repetition, perturbation size, size expectancy, and presence of a secondary cognitive task. Neuromuscular responses will be tracked using tibialis anterior and gastrocnemius medialis EMG sensors and

forceplatform centre of pressure dynamics. Beyond diagnostic classification, correlations between N1 responses and MABC-3 Scores and KTK3+ Balance performance will be explored. Fall questionnaires and diaries will capture real-life fall occurrence.

Results

As data analysis is pending, the abstract refrains from conclusions. If balance N1 scales with intrinsic balance difficulties, we expect greater amplitudes in children with DCD. Alternatively, error processing dysfunctions in DCD might impair the balance N1 response depending on varying conditions. We expect our paradigm to clarify both possibilities.

Understanding the impact of resting-state oscillatory power on motor imagery ability in children with and without DCD: the role of theta power

Authors:

Samaneh Nahravani, Deakin University
Jarrad Lum, Deakin University
Talitha Ford, Deakin University
Pam Barhoun, Deakin University
Aron Hill, Deakin University

Ian Fuelscher, Deakin University
Kaila Hamilton, Deakin University
Mughda Mukherjee, Deakin University
Gayatri Kumar, Deakin University
Jessica Waugh, Deakin University

Jacqueline Williams, Victoria University
Peter Enticott, Deakin University
Christian Hyde, Deakin University

Introduction

It has long been argued that children with Developmental Coordination Disorder (DCD) may experience difficulties engaging in motor imagery (MI), a cognitive process thought to reflect one's ability to engage internal models of movement. To date, little is known about the neurophysiological basis of these MI difficulties, hindering the clinical utility of prior behavioural findings. The present study aimed to investigate the contribution of resting-state theta EEG power to MI performance in children with and without DCD.

Methods

Participants were children aged 5–14 years, 14 with DCD and 30 typically developing. Each completed the Hand Rotation Task

(HRT) to assess MI ability and underwent resting-state EEG during eyes-open and eyes-closed conditions. Spectral power in the theta (4–7 Hz) band was extracted across 17 electrodes using EEGLAB in MATLAB. Inverse efficiency scores (IES) from the HRT indexed MI performance. Age, sex, and ADHD symptoms were controlled in all analyses.

Results

Children with DCD showed significantly higher mean IES scores (indicating decreased efficiency) on the HRT for biomechanically more complex lateral rotations compared to controls. In the eyes-open condition, partial Spearman analyses revealed significant (and trend level) negative correlations between theta power and total mean IES (FDR-corrected) at

fronto-parietal electrodes, including F3, F8, C3, C4, P7, P3 and P4. No significant effects were observed under eyes-closed conditions.

Conclusion

Similarly to earlier work, this study demonstrated that children with DCD are less efficient when performing MI, at least for biomechanically more challenging movements. This work extends earlier accounts by suggesting that reduced resting state theta power, particularly during eyes-open conditions, may be associated with poorer MI performance. This suggests that lower state-like readiness for top-down cognitive control of processes critical for MI (e.g. visuospatial attention) may be linked to poorer MI performance in those with and without DCD.

Longitudinal changes in frontoparietal brain activity and motor performance in children with Developmental Coordination Disorder: An fNIRS study

Authors:

Maja Van Grinderbeek, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium
Charlotte Johnson, Research Group MOVANT, Department of Rehabilitation Sciences and Physiotherapy, University of Antwerp, Belgium
Evi Verbecque, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium
Silke Velghe, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium
Linde Cauwelier, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium
Caterina Piazza, Scientific Institute IRCCS Eugenio Medea, Italy
Anna Falivene, Scientific Institute IRCCS Eugenio Medea, Italy
Alessandro Crippa, Scientific Institute IRCCS Eugenio Medea, Italy
Katrijn Klingels, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium

Introduction

Children with Developmental Coordination Disorder (DCD) show postural control problems, and structural and functional brain differences compared to typically developing peers. Although motor training has been shown to induce neuroplastic adaptations, longitudinal evidence of neural changes—whether spontaneous or training-induced—in DCD is still limited. This study examines changes in postural control task performance at behavioral and neural level in children with DCD over a non-training period of six months.

Methods

Twenty-three children with DCD (mean age $8.2y \pm 1.5$) completed two assessments, six months apart without training. During an alternate stair touch task (8 steps, 5 repetitions),

hemodynamic responses to neuronal activation in the Supplementary Motor Area (SMA)/ Premotor Cortex (PMC) and Parietal Lobes (PL) were recorded using functional Near-Infrared Spectroscopy (fNIRS). Stepping time and changes in cortical oxyand deoxyhemoglobin ($\Delta\text{HbO}/\Delta\text{HbR}$) were compared between sessions using paired-samples t-tests.

Results

Children performed the stepping task significantly faster at six-month follow-up ($p < 0.01$). Overall neural activity ($\Delta\text{HbO}/\Delta\text{HbR}$) showed no significant differences between timepoints. However, ΔHbR levels decreased on the dominant side in both SMA-PMC ($p = 0.030$) and PL ($p = 0.011$). No significant changes were observed on the non-dominant side.

Conclusion

Over six months, children with DCD demonstrated significant behavioral improvement in stepping performance, accompanied by subtle, lateralized neural changes resembling the neurotypical hemodynamic response. The high inter-individual variability underscores the heterogeneity within DCD and highlights the need for further analyses. These findings emphasize the importance of considering baseline variability and neural efficiency when interpreting intervention-induced changes in brain activity.

Response Inhibition in Children with DCD and ADHD: A Mobile-EEG and Dual-Task Approach

Authors:

Emily Meachon, 1. University of Basel, Faculty of Psychology, Switzerland 2. University of Basel, Department of Sport, Exercise and Health, Switzerland

Andy Cao, 1. University of Basel, Faculty of Psychology, Switzerland

Kian Abitorabi, 2. University of Basel, Department of Sport, Exercise and Health, Switzerland 3. University of Freiburg, Freiburg, Germany

Kate Wilmut, 4. Oxford Brookes University, Centre for Psychological Research, Faculty of Health, Science and Technology, Oxford Brookes University, United Kingdom

Alexander Grob, 1. University of Basel, Faculty of Psychology, Switzerland

Sebastian Ludyga, 2. University of Basel, Department of Sport, Exercise and Health, Switzerland

Response inhibition is a higher-order cognitive function enabling action suppression and cancellation behaviors used in daily life. This often incorporates motor skills and coordination, for example, stopping at a red light or avoiding pop-ups online. The complex interplay of cognitive-motor systems used for inhibition can be challenging for those with existing difficulties in cognitive and/or motor domains, such as DCD and AttentionDeficit/Hyperactivity Disorder (ADHD). In fact, inhibitory difficulties are core to the ADHD diagnosis and sometimes present as secondary challenges for those with DCD. Given that DCD and ADHD both (a) co-occur frequently, and (b) involve secondary executive functioning and motor difficulties, respectively, the source of inhibitory difficulties can be a challenge to discern in these groups. To improve the understanding of inhibitory mechanisms and clarify the clinical picture of response inhibition in DCD versus ADHD, the present

study takes a holistic approach to understand how children with DCD, ADHD, and typical development (TD) integrate and prioritize cognitive and motor skills for successful inhibition. Children between 8-13 years old recruited from November 2025 will complete a stop-signal task while sitting and walking with simultaneous mobile EEG measurement. Differences in cognitive and motor elements of task performance and corresponding brain activity (i.e., N2, P3) will be examined within-participants (i.e., sitting versus walking) and between groups (i.e., DCD; ADHD; TD). We expect that all individuals will show similar patterns from the sitting to walking tasks, however, those with DCD and/or ADHD will have reduced baselines in behavioral and neural outcomes compared to typically developing children. Preliminary results and early interpretations of the findings will be presented according to the latest sample recruited. Further interpretations and comparisons (e.g., by age) will be provided.

These findings will provide key insights into the degree and mechanisms of inhibitory difficulties in DCD versus ADHD.

Cognitive Profiles and Associated Factors in Children with comorbid ADHD and DCD

Authors:

Xuqi, Capital Center for Children's Health, Capital Medical University
Wanglin, Capital Center for Children's Health, Capital Medical University
Wang Jianhong, Capital Center for Children's Health, Capital Medical University
Zhang Lili, Capital Center for Children's Health, Capital Medical University
Xu Cuijuan, Capital Center for Children's Health, Capital Medical University
Li Xiaomeng, Capital Center for Children's Health, Capital Medical University
Zhu Yike, Capital Center for Children's Health, Capital Medical University
Wang Lei, Capital Center for Children's Health, Capital Medical University

Abstract

Objective

To investigate the characteristics of cognitive development and influencing factors in children with Attention Deficit Hyperactivity Disorder (ADHD) combined with Developmental Coordination Disorder (DCD), providing clinical evidence for comprehensive assessment and early individualized multidimensional intervention strategies.

Methods

A total of 218 children diagnosed with ADHD at the ADHD clinic of Capital Children's Medical Center (affiliated to Capital Medical University) between May 2024 and May 2025 were enrolled. Motor coordination was assessed using the

Developmental Coordination Disorder Questionnaire, while cognitive abilities were evaluated through the "Basic Cognitive Ability Test" developed by the Institute of Psychology, Chinese Academy of Sciences. Independent samples t-tests were employed to compare cognitive function levels (perception, attention, executive control, memory) between ADHD-only and ADHD-DCD combined groups. χ^2 test and multivariate logistic regression analysis were used to identify risk factors for ADHD combined with DCD.

Results

Among the 218 children, 179 (82.1%) were males and 39 (17.9%) were females, with an average age of (7.3 ± 1.0) years. Among them, 99 (45.4%) children exhibited ADHD combined with DCD. In terms of cognitive functions, children with

ADHD combined with DCD scored lower in processing speed and spatial perception than those with ADHD alone, with statistically significant differences ($t = -2.34$, $P = 0.037$; $t = -2.59$, $P = 0.012$). Risk factors for ADHD combined with DCD included male gender, family history of genetic disorders, and cesarean delivery (OR=2.45, 95%CI 1.08-5.56, $P = 0.033$; OR=3.37, 95%CI 1.09-10.46, $P = 0.035$; OR=2.05, 95%CI 1.12-3.73, $P = 0.019$).

Conclusion

Children with ADHD are prone to developing DCD, showing delayed processing speed and spatial perception compared to those with pure ADHD. The co-occurrence of DCD correlates with gender, family genetic history, and delivery method. In ADHD assessment and intervention strategies, emphasis should be placed on motor coordination development to ensure comprehensive and lasting intervention outcomes.

Impact of long-term motor-based interventions on brain structure and function in children with Developmental Coordination Disorder: A systematic review

Authors:

Maja Van Grinderbeek, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium

Alessandro Crippa, Scientific Institute IRCCS Eugenio Medea, Italy

Linde Cauwelier, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium

Katrijn Klingels, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium

Evi Verbecque, Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Belgium

Introduction

Motor-based training is key in treating children with Developmental Coordination Disorder (DCD). Despite their well-established neural differences compared to typically developing (TD) children, little is known about the neuroplastic changes after intervention. This systematic review synthesizes evidence on neuroplastic effects of longterm motor-based interventions in children with DCD.

Methods

Two independent reviewers systematically searched three databases. Studies were included if they involved: (i) children with DCD, with or without comorbidities (3-18 years), (ii) a long-term motor-based intervention (multiple intervention

days across several weeks), and (iii) at least one brain imaging outcome. Risk of bias was assessed with the ROB-2 and ROBINS-I V2 tools. Results were summarized via best-evidence synthesis.

Results

Seven articles met the inclusion criteria. Risk of bias ranged from low (N=1), some/moderate (N=4) to high (N=3). The studies were highly heterogeneous regarding imaging techniques (fNIRS; MRI; EEG; DTI), outcome measures (Oxy-hemoglobin; MNI coordinates; BOLD signal; event-related potentials), and regions of interest (prefrontal cortex; cerebellum; cortical grey matter). While children with DCD exhibit neuroplastic changes post-intervention, the direction and pattern differed from

TD peers. Increased functional connectivity was observed in attentional regions, suggesting compensatory mechanisms. No significant neuroplastic changes were observed in children with cooccurring ADHD.

Conclusion

Children with DCD can exhibit intervention-induced neuroplasticity, possibly reflecting compensatory mechanisms that facilitate motor learning, although these changes differ from TD profiles. However, the presence of comorbidities may hamper the training effects at brain level.

An abstract background featuring a complex, symmetrical geometric pattern in various shades of green. The pattern consists of overlapping, elongated shapes that create a star-like or floral effect, with some areas appearing more saturated than others, giving it a sense of depth and movement.

Verbal Session 8 - Physical and Mental Health

Joint association of physical activity and screen exposure with subsequent suspected developmental coordination disorder: A population-based study in China

Authors:

Liang Du, Shanghai Key Laboratory of Maternal Fetal Medicine, Department of Women's and Children's Health Care, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai, China 201204

Xiao Wang, Jiaying Maternity and Child Health Care Hospital, Jiaying, China

Jing Li, Jiaying Maternity and Child Health Care Hospital, Jiaying, China

Jing Hua, Shanghai Key Laboratory of Maternal Fetal Medicine, Department of Women's and Children's Health Care, Shanghai First Maternity and Infant Hospital, School of Medicine, Tongji University, Shanghai, China 201204

Objective

This study aimed to investigate the joint association of physical activity (PA) and screen exposure time (SET) with suspected developmental coordination disorder (DCD) in Chinese preschoolers.

Methods

This study used data from a nationally representative, stratified cluster survey covering 551 cities across China. Motor coordination was assessed using the Little Developmental Coordination Disorder Questionnaire (LDQDQ), and suspected DCD was defined according to age- and sex-specific cut-offs. Parent-reported data was used to calculate total daily physical activity (TDPA), moderate-to-vigorous physical activity (MVPA), and daily SET over the previous 12 months. The interactions between PA and SET were examined on both additive

and multiplicative scale. Multilevel logistic regression models were employed to explore the association of PA and SET with suspected DCD.

Results

The study included 129,278 preschoolers, among whom 19,969 (15.447%) were suspected DCD. Compared with children in the normal TDPA & SET < 1h group, those with low TDPA & SET < 1h had higher odds of subsequent suspected DCD (aOR = 1.24, 95% CI: 1.16-1.32) when adjusting for maternal and children's characteristics. Conversely, children with low MVPA & SET < 1h group had slightly lower odds (aOR = 0.89, 95% CI: 0.80-0.98). However, any combination involving SET ≥ 1h was consistently associated with increased odds of suspected DCD. Stratified analyses revealed that: (1) at SET ≤ 4h, low TDPA was a risk factor for suspected DCD, whereas low MVPA appeared

protective; (2) at SET > 4h, neither TDPA nor MVPA showed significant associations; and (3) across all PA strata, SET ≥ 1h was significantly associated with the risk of suspected DCD.

Conclusion

Both insufficient PA and excessive SET were independently and jointly associated with a higher risk of subsequent suspected DCD among Chinese preschoolers. Screen exposure of one hour or more per day was a consistent and major risk factor regardless of physical activity level, underscoring the need for early behavioural interventions and family-based lifestyle guidance to promote motor development for preschoolers.

Teacher's perceptions of strengths and positive traits in children with neurodevelopmental conditions

Authors:

Amy De Roubaix, Department of Psychiatry and Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center, Nijmegen, the Netherlands

Jennifer de Smidt, Department of Psychiatry and Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center, Nijmegen, the Netherlands

Lessa M. Schippers, Department of Psychiatry and Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center, Nijmegen, the Netherlands

Martine Hoogman, Department of Psychiatry and Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center, Nijmegen, the Netherlands

Introduction

Research and discourse of neurodevelopmental conditions (NDC) is often deficit-laden. In contrast, strength-based perspectives offer promising avenues for a more balanced understanding. While some studies have explored strengths in individuals with better-known NDCs, such as Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), or Specific Learning Disorder (SLD), knowledge about strengths in individuals with lesser-known conditions such as Developmental Coordination Disorder (DCD) and Developmental Language Disorder (DLD) remains limited. Moreover, research rarely considers their overlap and most work focuses on adults and self-reports. As children spend considerable time at school, teachers may serve as valuable informants.

Methods

Therefore, in this mixed-method study we investigate teachers' perspectives on strengths in children with NDCs. Participants are selected based on purposeful maximum variation sampling techniques prioritising diversity in (1) the teachers' experience with specific conditions (ADHD, SLD, DCD, DLD, and/or ASD), (2) primary/secondary school, and (3) country (Belgium / the Netherlands). A semi-structured interview is conducted with each teacher. Next, teachers complete the Signature Strengths Survey (SSS), indicating whether each of the 24 predefined universal character strengths defined by the Virtues in Action (VIA) framework is characteristic of students with specific NDCs they have experience with. The qualitative interview data is inductively and thematically analysed, and the resulting themes will be examined in relation to the theoretical VIA framework. As of November 2025, ten interviews have been completed.

Expected outcomes

A total of 20 interviews are expected. Preliminary findings indicate that teachers readily identify and articulate positive characteristics in their students. The final results will present distinctions and overlaps in identified strengths across conditions, contributing to a more nuanced understanding of strengths in children with NDCs.

Quality of Life in Children with Developmental Coordination Disorder (DCD): A Large-Scale Study of South African Children

Authors:

Bouwien Smits-Engelsman, Physical Activity, Sport and Recreation (PhASRec), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa

Wilmarié Du Plessis, Physical Activity, Sport and Recreation (PhASRec), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa

Dané Coetzee, Physical Activity, Sport and Recreation (PhASRec), Faculty of Health Sciences, North-West University, Potchefstroom, South Africa

Background

Previous research indicated that children with DCD experience reduced health-related quality of life (HRQoL) compared to typically developing (TD) peers. However, little evidence is available from African countries. This study aimed to assess HRQoL using child self-reports in a large sample of South African children.

Methods

Children aged 6–12 years with DCD ($n = 112$) and without DCD ($n = 677$) participated. DCD was defined as scoring below the 16th percentile on the MABC-2 and experiencing daily life difficulties (e.g., mobility, dressing, usual activities) and with normal learning abilities. The health professional who tested the children checked that no other neurological or orthopedic conditions that would preclude a DCD diagnosis were present. HRQoL was measured using the KIDSCREEN-10 Index and the EQ-VAS Self-Complete version. Group differences were

analyzed using (non-) parametric t-tests for total scores and crosstabulation at item level.

Results

Mean standard scores on the MABC-2 were 4.7 (SD 1.8) and 8.7 (SD 2.2) for the DCD and TD group, respectively. Children with DCD reported significantly lower HRQoL compared to TD peers ($p < 0.001$). The EQ-VAS score for “Health Today” was 76 (SD 24) in the DCD group versus 88 (SD 29) in TD children. Median KIDSCREEN-10 scores were 25 (IQR 20–31) for DCD and 31 (IQR 25–35) for TD children. All KIDSCREEN items showed significant differences. The largest differences were found in Perceived health ($d 0.53$), “Have you felt full of energy” ($d 0.44$) and “Have you had fun with your friends” ($d 0.43$).

Conclusion

Children with low motor scores with confirmed impact on their daily activities perceive their quality of life and health as

significantly lower than their typically developing peers. These findings underscore the importance of early identification and planning help for these children to improve participation and well-being.

The relationships between parental psychological distress and mental health in children with developmental coordination disorder

Authors:

Suraya Rehmat, Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University

Huynh-Truc Tran, Department of Public Health, China Medical University

Yao-Chuen Li, Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University

Introduction

Beyond motor challenges, children with developmental coordination disorder (DCD) frequently experience increased anxiety, emotional distress, and behavioral problems. Parents of children with DCD also commonly report elevated psychological distress due to the ongoing demands of supporting their children's motor, academic, and social development. Such parental distress could further deteriorate children's emotional and behavioral problems, highlighting the importance of understanding family processes. Therefore, this study examined the relationship between parental psychological distress and children's mental health in families with children at risk for DCD.

Methods

A total of 123 children aged 4 to 6 years were recruited, with 116 children (94.3%) providing valid data. Based on the results of the Movement Assessment Battery for Children–2nd Edition test,

children were categorized into either “at risk for DCD (rDCD)” or typically developing. Children's emotional and behavioral problems were assessed using the Child Behavior Checklist (CBCL), and parental psychological distress was measured using the Kessler-6 scale. Mediation analyses were conducted using Hayes' PROCESS Macro with 95% bootstrapped confidence intervals. Child sex was included as a covariate.

Results

No direct or indirect effects of rDCD status were found on children's internalizing problems, externalizing problems, and overall mental health. However, there was a consistent, significant effect of parental psychological distress on all outcomes of children's mental health (all p 's < .001).

Conclusion

Parental psychological distress significantly contributes to

children's emotional and behavioral difficulties but does not mediate the relationship between DCD and childhood mental health outcomes. These findings underscore the independent role of parental psychological distress in shaping child mental health, regardless of motor status, and highlight the need for family-centered support strategies in both clinical and early intervention contexts.

Move2Engage: Effects of group-based exercise interventions on physical activity, wellbeing and mental health in children with DCD

Authors:

Melissa Licari, The Kids Research Institute Australia
Jenny Downs, The Kids Research Institute Australia
Kate McKinnon, The University of Western Australia
Jordey Holker, The University of Western Australia
Gail Alvares, The Kids Research Institute Australia
Jess Reynolds, The Kids Research Institute Australia
Andrew Whitehouse, The Kids Research Institute Australia
Siobhan Reid, The University of Western Australia

Introduction

Children with neurodevelopmental disorders commonly experience movement difficulties that limit their participation in physical activity, posing risks to physical health and social-emotional wellbeing. Targeted opportunities for these children to engage in meaningful physical activity is critical. This study compared outcomes between two exercise interventions: one using cognitive strategies (CO-OP) and the other explicit instruction.

Methods

Forty-one children (mean age 10.2, range 7-13 years, 72% male) participated. All scored within the clinical or at-risk ranges for DCD on the MABC-2 (<16%); 45% had a formal DCD diagnosis, 48% ASD, and 51% ADHD. Children were allocated into groups of 7-10 based on their exercise goals, and intervention type was randomised. Each group completed a 12-

week goal-oriented program (90 minutes per session) delivered by two exercise physiologists. Outcomes included activity levels (7-day accelerometry), goal attainment (GAS), participation and enjoyment (CAPE), mental health (SDQ), sleep (SDSC), and quality of life (QI-Disability).

Results

No significant differences were observed between the two intervention types across any outcome. Across both groups, children demonstrated significant increases in moderate to vigorous physical activity (pre=47.9+13.8, post=52.65+10.35 min/day; $p=0.03$), enjoyment of physical activity (pre=3.45, post=3.62; $p=0.015$), and overall quality of life (pre=68.5, post=73.1; $p=0.013$). More than 70% of individual goals were achieved, indicating strong functional gains across both interventions. Although most children continued to fall within the clinical range for mental health concerns (pre=92%,

post=86%), hyperactivity symptoms significantly decreased ($p=0.02$). No changes were observed in sleep behaviour, with 28% remaining in the clinical range for sleep disturbances (>70 SDSC).

Conclusion

Both interventions produced similar improvements in children's physical activity, enjoyment, quality of life, and attainment of goals. These findings highlight the value of structured, goal-oriented exercise interventions for children with DCD and cooccurring neurodevelopmental disorders. Persisting mental health challenges suggest the need for complementary supports to address broader psychosocial outcomes.