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PERCEIVED EXECUTIVE FUNCTIONING AND ATTITUDES TOWARD INCLUSION AMONG HYDROTHERAPISTS WORKING WITH CHILDREN WITH SPECIAL NEEDS

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Perceived Executive Functioning and Attitudes toward Inclusion among Hydrotherapists Working with Children with Special Needs

Idit SHOSHAN[1], Dan CHIRIBUCĂ[2]

Abstract

This study investigated the relationship between hydrotherapists' attitudes toward the social inclusion of children with special needs and their perceptions of these children's executive functioning (EF). Hydrotherapists (N=69) from rehabilitation centers and clinics across Israel completed questionnaires assessing demographic and professional characteristics, attitudes toward inclusion, and perceived EF challenges and strengths in children (PIC-ME, adapted as a clinician-report measure). Results revealed a significant positive correlation between children's EF and therapists' attitudes: higher levels of EF -specifically self-regulation - consistently predicted more favorable attitudes toward inclusion. The findings also suggest that hydrotherapists' attitudes toward inclusion are linked to both their professional background and their perceptions of children's functional abilities in everyday therapeutic contexts. The study underscores the need to consider how clinicians' perceptions may shape expectations and support regarding children's social inclusion and the importance of addressing executive functioning - particularly emotional regulation - in both therapeutic practice and professional training.

Keywords: hydrotherapy; attitudes toward inclusion; executive functions; emotional regulation; children with special needs; clinician perspectives.

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Introduction

The social inclusion of children with special needs is widely recognized as a central goal in educational, therapeutic, and community contexts. Inclusion refers to the meaningful participation of individuals with disabilities in normative social environments, with access to shared activities, relationships, and opportunities for development (Ainscow, 2020; UNESCO, 2020). In this study, inclusion is viewed as influenced not only by children's functional abilities but also by the attitudes of professionals who support themw. Among these professionals, therapists play a key role, as their expectations and perceptions may shape both intervention practices and opportunities for participation (Sharma Umesh & Sokal, 2015).

Hydrotherapy is an individual treatment conducted by registered therapists, using water's physical and chemical properties to enhance physical and mental functions (Goldby & Scott, 1993; Sarvinoz & Muzaffar, 2022). Beyond improving physiological measures (range of motion, strength, balance), water provides playful experiences that reduce fear, boost self-confidence, and support social and cognitive skills (Geytenbeek, 2002; Sony *et al*., 2021). Children referred to hydrotherapy include those on the autistic spectrum (ASD) (Teske, 2018; Guieta-Rodriguez *et al*., 2021; Manga, 2021; Vodakova *et al*., 2022), with cerebral palsy (CP) (Getz *et al*., 2006, 2015; Kadosh, 2015), visual impairments (Nissim *et al*., 2021), sensory-regulation difficulties (Boyom Kaplan, 2023), diverse syndromes such as Rett Syndrome (Lotan, 2006; Getz *et al*., 2015; Fonzo *et al*., 2020), and those referred for emotional therapy in water (Geytenbeek, 2002; Mooventhan & Nivethitha, 2014). The aquatic environment provides conditions that facilitate movement, reduce physical constraints, and create opportunities for engagement that may not be limited by land-based restrictions. Beyond its established physical benefits, hydrotherapy has been associated with improvements in psychosocial functioning, including self-confidence, emotional well-being, and social interaction (Geytenbeek, 2002; Ogonowska-Slodownik Agnieszka *et al*., 2024). Emotionally, water simulates a protective, womb-like state, enabling trauma and fear processing while improving overall mental wellbeing (Becker, 2009; Stein & Unger-Arnov, 2016). The unique properties of water—such as buoyancy and hydrostatic pressure—demand constant neurocognitive adaptation, requiring children to exert significant emotional regulation and inhibitory control to manage sensory input and postural challenges. Consequently, the hydrotherapist's role transcends physical assistance, involving the constant modulation of the child's executive engagement, which in turn may shape the clinician's overall perception of the child's readiness for broader social inclusion.

Within this context, executive functions (EF)—a set of higher-order cognitive processes including inhibition, working memory, cognitive flexibility, and emotional regulation—are particularly relevant. They include attention, planning, organization, assessment, and behavioral adaptation (Cook & Forchelli, 2019; Spaniol & Danielsson, 2022; Dimachkie Nunnally *et al*., 2023), forming the

basis for self-regulation, a key predictor of academic, social, and employment outcomes (Coelho *et al*., 2019; Koene *et al*., 2022). EF supports goal-directed behavior and adaptive functioning in everyday life and is strongly associated with academic achievement, social competence, and long-term independence (Diamond, 2013; Best & Miller, 2010). Children with special needs, particularly those with ASD or intellectual impairments, often show deficits in EF, especially self-regulation and flexibility, leading to social difficulties, peer rejection, and vulnerability to bullying (Hollocks *et al*., 2014; Kloosterman *et al*., 2014; McGonigle-Chalmers & McCrohan, 2017). EF and communication skills are crucial for independent functioning, as deficits impair daily task management, ability to participate successfully in inclusive environments, or later in life, their labor market integration (Munsell *et al*., 2022; Spaniol & Danielsson, 2022). A growing body of research highlights that performance-based measures of EF do not fully capture how these skills operate in real-world contexts, and that informant-based assessments provide ecologically valid insights into children's everyday functioning (Toplak Maggie E. *et al*., 2013; Barkley Russell A., 2012). Clinicians who engage in repeated, structured interactions with children may therefore be well positioned to observe patterns of regulation, attention, and adaptive behavior as they unfold across therapeutic situations. These perceptions are likely to be particularly relevant when considering professionals' attitudes toward inclusion. These attitudes reflect beliefs about the feasibility, benefits, and appropriateness of integrating children with special needs into mainstream settings. Previous research has shown that such attitudes are influenced by factors such as professional experience, training, and direct contact with individuals with disabilities (Avramidis Elias & Norwich, 2002; Sharma Umesh et al., 2008). Despite the relevance of these factors, research examining the relationship between perceived executive functioning and professionals' attitudes toward inclusion remains limited, particularly in therapeutic contexts such as hydrotherapy. Existing studies have primarily focused on teachers or educational settings, with less attention given to therapists' perspectives and how these relate to their perceptions of children's functional abilities in practice.

Addressing this gap, the present study examines the association between hydrotherapists' attitudes toward inclusion and their perceptions of children's executive functioning in everyday therapeutic contexts. In addition, the study explores whether hydrotherapists' demographic and professional characteristics contribute to explaining attitudes toward inclusion, and whether perceived EF provides additional explanatory value beyond these factors.

It was hypothesized that (1) higher levels of perceived EF challenges would be associated with less favorable attitudes toward inclusion, whereas stronger perceived EF abilities would be associated with more positive attitudes; and (2) hydrotherapists' background and professional characteristics would be associated with attitudes toward inclusion, with perceived EF contributing additional unique variance beyond these factors.

Methodology

Participants

Sixty-nine hydrotherapists participated: 14 males (20.3%) and 55 females (79.7%), reflecting the predominance of women in the profession. Ages ranged from 23 to 68 (M = 44.38, SD = 11.17), and years of seniority ranged from 1 to 26 (M = 4.74, SD = 5.49).

A priori power analysis was conducted using G*Power 3.1 to estimate the sample size required to detect medium-sized effects in regression analyses ($f^2 = 0.15$, $\alpha = .05$, power = .80). The analysis indicated that a minimum of 67 respondents was required.

Hydrotherapists completed a background questionnaire; gender and age were collected separately. Socioeconomic and residential characteristics (Table 1) provide additional context for the sample, indicating variability in income levels, geographic distribution, and types of residence across participants.

Table 1. Hydrotherapists' Background Characteristics (N = 69)

Characteristics	Values	Frequency (%)
Gender	Male	14 (20.3%)
	Female	55 (79.7%)
Sector	Arab	21 (30.4%)
	Jewish	48 (69.6%)
Education	Professional certification	34 (49.3%)
	B.A.	27 (39.1%)
	M.A.	8 (11.6%)
Marital status	Single	16 (23.2%)
	Married	40 (58.0%)
	Divorced	13 (18.8%)
Children	No	17 (24.6%)
	Yes	52 (75.4%)
Family income	Well-below average	5 (7.2%)
	Below average	11 (15.9%)
	Average	45 (65.2%)
	Above average	5 (7.2%)
	Well-above average	3 (4.3%)

Residential area	North	25 (36.2%)
	Center	28 (40.6%)
	South	16 (23.2%)
Type of residence	Moshav or community settlement	28 (40.6%)
	Village	7 (10.1%)
	Kibbutz	5 (7.2%)
	City	29 (42.0%)

Participants also provided information on professional experience, including additional jobs, weekly schedules, pool hours, and populations served. These professional characteristics are summarized in Table 2.

Table 2. Hydrotherapists' Professional Characteristics (N = 69)

Characteristics	Values	Frequency (%)
Other job than hydrotherapy	No, only hydrotherapy	6 (8.7%)
	Yes	63 (91.3%)
Number of workdays	1-2 days	22 (31.9%)
	3-4 days	34 (49.3%)
	5-6 days	13 (18.8%)
Number of weekly working hours at the pool	Less than 4 hours	5 (7.2%)
	4-10 hours	25 (36.2%)
	11-16 hours	15 (21.7%)
	17-24 hours	16 (23.2%)
	25 hours and above	8 (11.6%)
The primary population with whom the hydrotherapist works	Children	28 (40.6%)
	Adolescents	0 (0.0%)
	Adults	7 (10.1%)
	Individuals with special needs	34 (49.3%)

As shown in Table 2, most hydrotherapists held additional jobs besides hydrotherapy (91.3%). Weekly work schedules varied, with nearly half working three to four days, and pool hours ranged from under four to 25+ per week, most working 4–16 hours (57.9%), reflecting differences in workload and engagement.

Participants served diverse populations, including children, adults, and individuals with special needs. Nearly half primarily worked with children with special needs, highlighting substantial exposure to populations requiring

tailored interventions. This professional diversity provides important context for understanding hydrotherapists' attitudes toward inclusion and their perceptions of patients' EF abilities.

Materials

Participants completed three questionnaires: (1) Background and Professional Characteristics; (2) Attitudes Toward Inclusion Scale (Antonak & Larrivee, 1995); (3) Pictorial Interview of Children's Meta-Cognition & Executive Function (PIC-ME, Traub, Bar-Ilan, & Maeir, 2017).

Background and Professional Characteristics Questionnaire: Developed for this study, it collected demographic and professional information. The background section included gender, age, sector, education, marital status, children, family income, residential area, and type of residence. The professional section addressed work patterns and clinical experience: additional employment, years of seniority, days worked per week, weekly pool hours, and client populations. These items provided a comprehensive view of therapists' professional backgrounds and practice context.

Attitudes Toward Inclusion Scale (Antonak & Larrivee, 1995): Attitudes toward inclusion were measured using the 18-item Attitudes Toward Inclusion Scale, assessing perspectives on integrating students with disabilities into mainstream settings. Eight items reflect positive attitudes (e.g., "Inclusion prepares children with disabilities for the real world"), and ten reflect negative attitudes (e.g., "In inclusion, children with disabilities receive less individualized instruction"). Items use a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), with higher scores indicating more positive attitudes. The scale has four factors: (1) Benefits of Inclusion - seven items on perceived advantages for children with and without disabilities; (2) Satisfaction with Special Education - five items on parents' satisfaction with special education versus inclusive settings; (3) Teacher Ability and Inclusion Support - four items on teachers' competence and attitudes toward inclusion; (4) Child Rights - two items on philosophical and legal justifications. The scale has strong psychometric properties. Previous studies reported Cronbach's alphas of .86, .74, .70, and .63 for the four factors, and .83 overall (Leyser & Kirk, 2004). In this study, overall reliability was good (α = .80), with factor reliabilities: Benefits of Inclusion (α = .71), Satisfaction with Special Education (α = .71), Teacher Ability and Inclusion Support (α = .82), and Child Rights (α = .70).

Pictorial Interview of Children's Meta-Cognition and Executive Function (PIC-ME): EF was assessed using the parent version of the PIC-ME (Traub, Bar-Ilan, & Maeir, 2017), developed at the School of Occupational Therapy, Hebrew University of Jerusalem. The PIC-ME is a pictorial self- and observer-report tool evaluating EF challenges and strengths in children aged 5-10 in daily life. Only the parent questionnaire was used, providing an observer-report suitable for hydrotherapists to assess patients' executive functioning from a clinician's perspective. The

questionnaire has 44 items: 34 represent EF challenges across eight domains: Effort, Emotional Regulation, Working Memory, Activation, Inhibition, Focus, Transitions, and Organization, and 10 representing EF strengths. Items are rated on a 4-point Likert scale (1 = never, 4 = almost always). For EF challenges, higher scores indicate greater difficulty. For EF strengths, scoring was reversed so higher scores similarly reflect greater difficulty (lower strengths). Previous studies show excellent internal reliability for the parent questionnaire (α = .969) and adequate content and face validity (Amsili-Yahbas, 2014). In this study, overall reliability was excellent (α = .97), with EF challenges α = .96 and EF strengths α = .82. Reliability for the eight challenge domains: Effort α = .72, Emotional Regulation α = .79, Working Memory α = .84, Activation α = .75, Inhibition α = .86, Focus α = .80, Transitions α = .79, Organization α = .89.

Although the PIC-ME was originally developed as a parent-report instrument, its use in the present study was adapted to capture hydrotherapists' professional perceptions of children's executive functioning in applied clinical contexts. This approach is supported by literature emphasizing the value of ecologically valid, informant-based assessments of executive functioning, particularly in naturalistic settings where behavior unfolds in real time (e.g., Gioia *et al*., 2000; Anderson, 2002). Research on executive functioning has consistently highlighted that performance-based tests and real-world behavior often diverge, and that ratings provided by adults who interact regularly with children - such as parents, teachers, and clinicians - offer complementary and ecologically grounded insights into everyday functioning (Toplak *et al*., 2013; Barkley, 2012). In particular, professionals who engage in repeated, structured interactions with children are considered well-positioned to observe regulatory, attentional, and behavioral patterns across contexts and over time.

Moreover, the decision to employ a therapist-reported measure aligns with the study's primary focus on perceived executive functioning, rather than objective neuropsychological performance. To enhance reliability, participants were instructed to base their responses on cumulative experience with children attending at least six therapy sessions, thereby reducing the influence of isolated observations.

Procedure

Data collection was approved by the Faculty of Sociology Ethics Committee at Babeș-Bolyai University (UBB) and followed ethical guidelines from the International Sociological Association (2001) and the Belmont Report (1978). Participation was voluntary, with informed consent obtained. Confidentiality and anonymity were strictly maintained, with no personal identifiers collected. The study was carried out without intervening in therapy or targeting individual children.

Participants were recruited via purposive sampling from rehabilitation centers and clinics across Israel providing hydrotherapy to children and individuals with special needs.

Hydrotherapists reported general impressions of their patients' EF as a group rather than individual children, reflecting typical EF patterns from their professional experience. Children were required to attend at least six hydrotherapy sessions to ensure therapists had sufficient exposure for reliable assessment.

Data Analysis

Preliminary analyses included descriptive statistics, skewness, and kurtosis. Although some deviations from normality were observed for executive functioning variables, these were not severe. Therefore, Spearman's rho correlations were used to examine bivariate associations, providing a conservative, distribution-free estimate of relationships.

For multivariate analyses, hierarchical multiple regression was conducted to examine the contribution of hydrotherapists' background and professional characteristics and perceived executive functioning to attitudes toward inclusion. Predictors were entered in theoretically informed blocks. In Block 1, background and professional variables (e.g., experience working with children with special needs, residential area) were entered based on their relevance. In Block 2, perceived executive functioning variables were added to assess their incremental explanatory value beyond background characteristics.

Composite Likert-scale scores were treated as approximately continuous variables, consistent with common practice in behavioral and social sciences research. Given the sample size, results were interpreted with caution, with emphasis placed on effect sizes and consistency of patterns rather than isolated significance levels.

Regression assumptions were examined prior to analysis. Multicollinearity was assessed using tolerance and variance inflation factors (VIF), and independence of residuals was evaluated using the Durbin-Watson statistic. No violations were detected. Analyses were conducted for overall attitudes and for each of the four subscales: Benefits, Satisfaction with Special Education, Teacher Ability and Inclusion Support, and Child Rights. Given the study's exploratory but theory-informed nature and the relatively small sample size, the number of predictors included in each model was limited. To reduce redundancy and potential multicollinearity, executive functioning was modeled in separate analyses using either total executive functioning challenge scores or specific executive functioning components. This approach allowed examination of both overall and domain-specific associations while maintaining model parsimony.

Significance Threshold Adjustment

Given the number of analyses conducted, results were interpreted cautiously, with emphasis placed on the magnitude and consistency of effects across models rather than on isolated p-values. Instead of applying strict correction procedures, which may increase the risk of Type II errors in smaller samples, the interpretation focused on theoretically meaningful and replicable patterns of associations.

Results

Preliminary Analyses. Descriptive Statistics

Descriptive statistics for the PIC-ME and Attitudes toward Inclusion measures are presented in Table 3.

Table 3. Descriptive Statistics of the PIC-ME and Attitudes Towards Inclusion Measures (N = 69)

	Mean	SD	Min	Max	Skewness	Kurtosis
PIC-ME Measures (1-4)						
EF challenges[1]	2.88	0.67	1.71	4.00	.14	-.91
Effort	2.99	0.70	2.00	4.00	.11	-1.35
Emotional regulation	2.84	0.88	1.67	4.00	-.07	-1.46
Working memory	2.50	0.88	1.33	4.00	.55	-.91
Activation	3.07	0.67	2.00	4.00	-.08	-1.41
Inhibition	2.85	0.71	1.63	4.00	-.03	-.84
Focus	2.98	0.70	1.80	4.00	-.01	-1.18
Transitions	2.85	0.87	1.00	4.00	-.35	-.53
Organization	2.68	1.00	1.00	4.00	-.08	-1.25
EF strength[2]	2.82	0.64	1.50	4.00	.43	-.63
PIC-ME - total	2.87	0.65	1.82	4.00	.29	-.89
Attitudes Towards Inclusion Measures (1-5)						
Benefit factor	4.00	0.59	2.57	5.00	-.39	-.43
Satisfaction with special education	3.77	0.73	2.00	5.00	-.25	-.84
Teacher ability and inclusion support	3.47	0.94	1.25	5.00	-.16	-.33
Child rights	3.70	0.96	1.00	5.00	-.36	-.36

Attitudes towards inclusion - total	3.79	0.51	2.89	5.00	.58	-.21

[1]EF challenges: Higher scores on this measure indicate greater challenges.

[2]EF strength: Higher scores on this measure indicate lower strength.

Hydrotherapists reported moderate levels of perceived executive functioning challenges (M = 2.87, SD = 0.65), with subscale means ranging from 2.50 (Working memory) to 3.07 (Activation). Overall attitudes toward inclusion were positive (M = 3.79, SD = 0.51), with the highest scores for the Benefit factor (M = 4.00, SD = 0.59) and lower scores for Teacher Ability and Inclusion Support (M = 3.47, SD = 0.94).

Preliminary analyses indicated no severe deviations from normality. Given some departures from normality in EF-related variables, nonparametric analyses were used.

Associations between EF challenges and attitudes toward inclusion

To examine associations between hydrotherapists' perceptions of children's executive functioning and their attitudes toward inclusion, Spearman correlations were conducted (Table 4).

Table 4. Spearman Rho Correlation Coefficients between PIC-ME and Attitudes Towards Inclusion Measures (N = 69)

PIC-ME Measures	Attitudes Towards Inclusion Measures				
	Attitudes Towards Inclusion - total	Benefit factor	Satisfaction with special education	Teacher ability and inclusion support	Child rights
EF challenges[1]	-.39***	-.41***	-.04	-.42***	-.40***
Effort	-.32**	-.26*	-.08	-.34**	-.35**
Emotional regulation	-.50***	-.44***	-.17	-.46***	-.36**
Working memory	-.33**	-.38***	-.06	-.37**	-.23
Activation	-.34**	-.42***	.13	-.40***	-.44***
Inhibition	-.37**	-.35**	-.10	-.42***	-.30*

Focus	-.20	-.28*	.12	-.34**	-.33**
Transitions	-.21	-.41***	.13	-.26*	-.31**
Organization	-.33**	-.36**	.01	-.30*	-.30*
EF strength[2]	-.29*	-.34**	.04	-.36**	-.28*
PIC-ME - total	-.39***	-.41***	-.04	-.42***	-.38*

**p < .05, **p < .01, ***p < .001*

[1]EF challenges: Higher scores on this measure indicate greater challenges.

[2]EF strength: Higher scores on this measure indicate lower strength.

Overall, higher levels of perceived executive functioning challenges were moderately associated with less favorable attitudes toward inclusion [ρ = -.39, p < .001]. This pattern was observed for the overall attitude score and for most subscales, particularly the Benefit factor, Teacher ability and inclusion support, and Child rights.

Among executive functioning components, emotional regulation showed the strongest association with attitudes toward inclusion [ρ = -.50, *p* < .001]. Other components (e.g., effort, working memory, activation, inhibition, and organization) showed smaller but consistent associations in the same direction.

Perceived executive functioning strengths were also associated with attitudes toward inclusion, following a similar pattern, although effect sizes were generally smaller.

No significant associations were observed with the Satisfaction with special education subscale.

Hierarchical Regression Analyses. Hydrotherapists' Attitudes toward Inclusion

To examine whether hydrotherapists' background characteristics and perceived executive functioning contribute to attitudes toward inclusion, a hierarchical regression analysis was conducted (Table 5). Prior to conducting the regression, the assumptions of multicollinearity and residual independence were assessed. Tolerance values ranged from .890 to 1.00, and variance inflation factors (VIFs) ranged from 1.00 to 1.124, both well within commonly accepted thresholds. Background and professional variables were entered in the first block, followed by EF variables in the second block. Given the relatively small sample size and the number of potential predictors, a data-driven selection procedure was applied within each block to retain only variables that demonstrated meaningful associations with the outcome.

Table 5. Hierarchical Regression Results for the Hydrotherapists' Attitudes Towards Inclusion by Their Background and Professional Characteristics and their Patients' Challenges and Strengths (N = 69)

Block	Explanatory variables	B	SE.B	β	R^2	ΔR^2
1	Special needs[1]	.46	.11	.45***	.206***	----
	Special needs[1]	.53	.11	.53***		
	Center[2]	.26	.11	.26*	.266***	.060*
2	Special needs[1]	.46	.10	.46***		
	Center[2]	.21	.10	.21*		
	EF challenges[3]	-.26	.07	-.34***	.380***	.114***

**p < .05, ***p < .001*

[1]Special needs: 0 = Not working with population with special needs, 1 = Working with population with special needs.

[2]Center: 0 = Not living in the center of Israel, 1 = Living in the center of Israel.

[3]EF challenges: Higher scores on this measure indicate greater challenges.

As shown in table 5, in Block 1, working with children with special needs emerged as a significant predictor of more positive attitudes toward inclusion ($\beta = .53$, $p < .001$), explaining 20.6% of the variance. Living in the center of Israel contributed additional variance, although to a lesser extent ($\beta = .26$, $\Delta R^2 = 6\%$, $p < .05$), with the first block accounting for 26.6% of the total variance.

In Block 2, after controlling for background and professional characteristics, perceived executive functioning challenges contributed additional unique variance ($\beta = -.34, \Delta R^2 = .114, p < .001$), indicating that higher levels of perceived challenges were associated with less favorable attitudes toward inclusion. Perceived executive functioning strengths did not contribute uniquely to the model. The full model explained 38.0% of the variance in attitudes toward inclusion.

To further examine which components of executive functioning contributed uniquely to attitudes toward inclusion, an additional hierarchical regression analysis was conducted including the eight EF challenge domains (Table 6).

After accounting for background characteristics, emotional regulation emerged as the only EF component providing a unique contribution ($\beta = -.44, \Delta R^2 = 18{,}7\%$, $p < .001$). Higher perceived difficulties in emotional regulation were associated with less favorable attitudes toward inclusion. The full model accounted for 45.3% of the variance.

Table 6. Hierarchical Regression Results for the Hydrotherapists' Attitudes Towards Inclusion by Their Background and Professional Characteristics and Their Patients' Different Types of EF Challenges (N = 69)

Block	Explanatory variables	B	SE.B	β	R^2	ΔR^2
1	Special needs[1]	.46	.11	.45***	.206***	----
	Special needs[1]	.53	.11	.53***		
	Center[2]	.26	.11	.26*	.266***	.060*
2	Special needs[1]	.45	.10	.45***		
	Center[2]	.23	.10	.22*		
	Emotional regulation[3]	-.25	.05	-.44***	.453***	.187***

**p < .05, ***p < .001*

[1] *Special needs: 0 = Not working with a population with special needs, 1 = Working with a population with special needs.*

[2] *Center: 0 = Not living in the center of Israel, 1 = Living in the center of Israel.*

[3] *Emotional regulation: Higher scores on this measure indicate greater emotional regulation challenges.*

Attitudes toward Inclusion Subscales

To further explore hydrotherapists' attitudes toward inclusion, hierarchical regression analyses were conducted separately for each attitude subscale (Table 7), following the same analytical approach. This approach is appropriate given the exploratory nature of the study. It was examined whether hydrotherapists' background and professional characteristics explained variance in each attitude type, and whether children's EF challenges and strengths provided additional explanatory value.

Across models, working with children with special needs was consistently associated with more positive attitudes. Other background variables (e.g., working with adults, seniority, and geographic location) showed associations in specific models. Furthermore, perceived EF challenges contributed additional explanatory value for most subscales, particularly: Benefit factor, Teacher ability and inclusion support, Child rights. No executive functioning variables were associated with Satisfaction with special education.

Table 7. Hierarchical Regression Results for the Hydrotherapists' Different Types of Attitudes Towards Inclusion by Their Background and Professional Characteristics and Their Patients' Challenges and Strengths (N = 69)

Block	Explanatory variables	B	SE.B	β	R^2	ΔR^2
Benefit Factor						
1	Special needs[1]	.35	.14	.30*	.089*	----
	Special needs[1]	.47	.13	.40***		
	Center[2]	.44	.13	.37**	.214***	.125**
	Special needs[1]	.38	.13	.33**		
	Center[2]	.48	.13	.40***		
	Adults[3]	-.50	.22	-.26*	.274***	.060*
2	Special needs[1]	.31	.13	.26*		
	Center[2]	.43	.12	.36***		
	Adults[3]	-.52	.20	-.27*		
	EF challenges[4]	-.28	.09	-.32**	.371***	.097**
Satisfaction with Special Education Factor						
1	Special needs[1]	.56	.16	.39***	.149***	----
	Special needs[1]	.57	.15	.40***		
	Seniority	-.05	.01	-.37***	.284***	.135***
Teacher Ability and Inclusion Support Factor						
1	Special needs[1]	.51	.22	.28*	.075*	----
	Special needs[1]	.40	.20	.22*		
	EF challenges[4]	-.55	.15	-.40***	.229***	.154***
Child Rights Factor						
1	Special needs[1]	.47	.23	.25*	.060*	----
	Special needs[1]	.63	.23	.33**		
	Center[2]	.59	.23	.30*	.145**	.085*
2	Special needs[1]	.51	.22	.27*		
	Center[2]	.50	.22	.26*		
	EF challenges[4]	-.48	.16	-.34**	.254***	.109**

** p < .05, **p < .01, ***p < .001*

[1] Special needs: 0 = Not working with a population with special needs, 1 = Working with a population with special needs.

[2] Center: 0 = Not living in the center of Israel, 1 = Living in the center of Israel.

[3] Adults: 0 = Not working with adults' population, 1 = Working with adults' population.

[4] Emotional regulation: Higher scores on this measure indicate greater emotional regulation challenges.

Discussion

Consistent with the study hypotheses, higher levels of perceived executive functioning challenge**s** were associated with less favorable attitudes toward inclusion, whereas more positive perceptions of executive functioning were related to more supportive attitudes. These findings are in line with prior research suggesting that professionals' beliefs about inclusion are shaped, in part, by their perceptions of individuals' competencies and support needs (Avramidis & Norwich, 2002; Sharma *et al*., 2008). In this context, hydrotherapists who perceive greater difficulties in children's regulatory and adaptive functioning anticipate more challenges in inclusive settings, which may be reflected in more cautious or less supportive attitudes.

Among the different components of perceived executive functioning, emotional regulation emerged as the most salient factor associated with attitudes toward inclusion. This finding is aligned with theoretical and empirical literature highlighting the central role of emotional regulation in social participation, behavioral adaptation, and interaction with others (Diamond, 2013; Cahill *et al*, 2020). Difficulties in emotional regulation also influence how children are perceived in social contexts, as prior research suggests that dysregulated emotional responses can lead to negative social evaluations (Kloosterman *et al*., 2014). As such, therapists may place greater weight on regulatory abilities when forming expectations regarding children's capacity to engage in inclusive environments.

While the use of informant-based measures like the PIC-ME captures the ecological manifestation of EF challenges, it is important to note that these reflect therapists' professional perceptions rather than objective cognitive performance. In hydrotherapy settings, therapists engage in repeated, structured, and often intensive interactions with children in a dynamic sensory environment. In this context, regulatory abilities -such as emotional control, flexibility, and behavioral modulation- become particularly significant. As a result, therapists develop context-specific perceptions of children's functioning, which in turn are associated with how they evaluate the feasibility and desirability of inclusion. At the same time, the hydrotherapy environment itself plays a unique role in shaping these perceptions. Within this context, children's regulatory capacities become especially visible through their ability to adapt to changing physical and social demands. Therapists can interpret successful engagement in such an environment as indicative of broader adaptive potential, while observable difficulties in regulation are perceived as barriers to functioning in more complex social settings.

These context-specific interpretations may contribute to the observed associations between perceived executive functioning and attitudes toward inclusion.

The results also indicate that professional experience working with individuals with special needs is associated with more positive attitudes toward inclusion. From a theoretical perspective, this pattern may be understood through situated learning frameworks (Lave & Wenger, 1991), which emphasize the role of experiential learning and participation in shaping professional understanding. However, the present findings further suggest that experience alone is not sufficient; rather, its influence appears to be complemented by how therapists interpret children's functional abilities. In this sense, professional exposure and perceptual frameworks likely interact in shaping attitudes toward inclusion.

The observed association between geographic location (i.e., residing in central areas) and more positive attitudes further reflect contextual influences related to resource availability, access to professional networks, and exposure to inclusive practices. From an ecological perspective (Bronfenbrenner, 1977), such factors can be understood as part of the broader exosystem influencing professional beliefs and expectations. Differences in available services and institutional support may shape therapists' perceptions of the feasibility of inclusion, thereby contributing to variability in attitudes.

From a practical perspective, the findings suggest that efforts to promote inclusive attitudes among therapists benefit from addressing the interpretative frameworks through which professionals understand children's functioning. Training programs may therefore incorporate a stronger focus on executive functioning, particularly emotional regulation, alongside practical strategies for supporting regulatory challenges in therapeutic and group contexts. Enhancing therapists' understanding of the variability and context-dependence of executive functioning may contribute to more balanced and flexible expectations regarding inclusion.

Several limitations should be considered when interpreting these findings. First, the cross-sectional design does not allow conclusions regarding causality. Second, the reliance on therapist-reported measures introduces the possibility of shared method variance and subjective bias. In particular, the assessment of executive functioning was based on therapists' perceptions using an adapted instrument, which may raise questions regarding measurement equivalence and construct validity. In addition, the exploratory nature of the regression analyses and the absence of potentially relevant variables (e.g., type and severity of children's conditions, specific training background, or institutional characteristics) limit the explanatory scope of the models. Future research would benefit from adopting multi-informant and longitudinal designs, incorporating both subjective and objective assessments of executive functioning, and examining how therapists' perceptions evolve over time and across contexts. Further investigation of context-specific factors, including characteristics of therapeutic environments such as

hydrotherapy, would also deepen understanding of how professional attitudes toward inclusion are formed and maintained.

Conclusion

Hydrotherapists' attitudes toward inclusion are associated with their perceptions of children's executive functioning, particularly emotional regulation. These results highlight the importance of considering how children's functional characteristics are interpreted within therapeutic contexts. From an applied perspective, supporting therapists in understanding executive functioning variability and in interpreting regulatory behaviors may contribute to more inclusive attitudes. In this sense, both professional experience and context appear relevant in shaping how inclusion is evaluated in practice. Overall, the study underscores the need to address not only children's functioning, but also professionals' interpretative frameworks, in efforts to support inclusive practice.

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