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Original Article

Predictors of Evidence-Based Communication Strategy Use in Preschool Settings: The Role of Knowledge, Self-Efficacy, and Organizational Support in Autism Education

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Abstract

Objective: This study investigated the predictive relationships between kindergarten teachers' knowledge of communication skills for children with autism spectrum disorder (ASD), the teachers' self-efficacy beliefs, their attitudes towards inclusive education, their perceived organizational support, and their self-reported utilization of evidence-based communication strategies.

Method: A cross-sectional predictive correlational design was employed across government-operated kindergartens in Kerbala Governorate, Iraq. Stratified random sampling recruited 243 kindergarten teachers. Data were collected using a comprehensive self-administered questionnaire comprising validated instruments measuring demographic characteristics, autism-specific communication knowledge, teacher self-efficacy for inclusive practices using the Teacher Efficacy for Inclusive Practices Scale, attitudes towards inclusion using the Multidimensional Attitudes Scale Toward Persons with Disabilities, perceived organizational support using the Survey of Perceived Organizational Support, and frequency of evidence-based strategy use. Hierarchical multiple regression analysis was conducted to identify significant independent predictors of strategy implementation.

Results: The final regression model was highly significant ($F(7, 235) = 25.32$, $P < 0.001$) and accounted for 42% of the variance in teachers' use of evidence-based communication strategies ($R2 = 0.42$). Teacher self-efficacy emerged as the strongest independent predictor ($\beta = 0.35$, $P < 0.001$), followed by perceived organizational support ($\beta = 0.28$, $P < 0.01$) and professional experience ($\beta = 0.22$, $P < 0.05$). General knowledge about autism spectrum disorder ($\beta = 0.06$, $P = 0.12$) and attitudes towards inclusion ($\beta = 0.05$, $P = 0.23$) did not retain statistical significance as independent predictors when self-efficacy and organizational support were controlled.

Conclusion: Effective communication support for children with autism in inclusive preschool environments is determined by a complex interplay of individual psychological factors and organizational contextual variables. Professional development initiatives should prioritize cultivating teacher self-efficacy through experiential learning and coaching while fostering supportive school cultures and providing adequate resources and administrative encouragement.

Key words: *Autism Spectrum Disorder (ASD); Early Childhood Education and Care; Evidence-Based Practice; Self-Efficacy; School Teachers*

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Autism spectrum disorder (ASD) represents a heterogeneous neurodevelopmental condition characterized by persistent challenges in social communication and interaction, alongside restricted and repetitive patterns of behavior, interests, or activities (1). The prevalence of autism has increased substantially over recent decades (2, 3). A comprehensive systematic review and meta-analysis examining the Middle East and North Africa region found that country-specific prevalence estimates ranged from 0.01% in Oman to 6.50% in a 2024 study conducted in Iraq, with the overall regional prevalence estimated at 0.14% (4). This escalating prevalence carries profound implications for educational systems internationally, particularly for inclusive early childhood education environments where foundational social and academic competencies are established (5, 6). Communication deficits constitute a core diagnostic feature of ASD, manifesting through diverse presentations including delayed speech and language acquisition, difficulties initiating or sustaining conversations, atypical prosodic patterns, echolalia, and reduced comprehension of nonverbal social cues (7). These communication impairments extend beyond mere academic challenges; they represent fundamental barriers to social interaction, peer relationship formation, emotional expression, and behavioral regulation (8). The preschool period represents a particularly critical intervention window, as early targeted support can substantially mitigate the long-term developmental consequences of these communication challenges (9, 10).

A substantial body of intervention research has documented the efficacy of various evidence-based communication approaches for children with autism, including augmentative and alternative communication systems (11, 12) such as the picture exchange communication system, naturalistic developmental behavioral interventions (13), social skills training programs (14), and visual support strategies (15). Despite this body of evidence, a persistent research-to-practice gap continues to impede the widespread implementation of these validated approaches in typical classroom settings. The successful translation of research findings into educational practice depends critically upon the knowledge, skills, and professional preparedness of preschool teachers, who serve as the primary agents of communication support within inclusive early childhood environments (16). Teacher knowledge regarding ASD and associated communication interventions represents a necessary but insufficient condition for effective practice. Contemporary educational research has increasingly recognized that theoretical knowledge alone does not guarantee the implementation of evidence-based strategies in authentic classroom contexts (17). Several pivotal psychological and organizational factors mediate the translation of knowledge into actionable instructional practice. Teacher self-efficacy, conceptualized within Bandura's social cognitive theory as an individual's belief in their personal capability to execute specific tasks successfully, has emerged as a robust predictor of professional behavior (18). Educators with elevated self-efficacy demonstrate greater persistence when encountering challenging situations, increased willingness to adopt innovative instructional approaches, and enhanced capacity to maintain engagement with students who present complex learning needs (19, 20).

Similarly, teachers' attitudes towards inclusive education, encompassing their personal beliefs, values, and emotional responses regarding the integration of children with disabilities into mainstream classrooms, exert considerable influence on instructional decision-making (21). Educators who hold positive attitudes towards inclusion demonstrate greater flexibility in adapting instructional methods, increased collaboration with specialist colleagues, and enhanced capacity to create accepting classroom climates that facilitate social participation (22). Beyond individual teacher characteristics, the influence of the organizational context is paramount in determining the quality of inclusive educational practice (23). Perceived organizational support, defined as employees' perceptions regarding the extent to which their organization values their contributions and demonstrates genuine concern for their well-being, has been consistently linked to professional commitment, job satisfaction, and organizational citizenship behaviors (24). Within educational settings, perceived organizational support manifests through the availability of instructional resources, access to professional development opportunities, administrative encouragement and recognition, and the presence of collaborative professional structures (25). Research has demonstrated that on-site coaching and organizational support are instrumental in building teacher competence and confidence in supporting children with autism (26).

A recent review has documented that professional development programs incorporating behavioral skills training and consultation-based approaches produce substantial improvements in teacher effectiveness and student communication outcomes (27). Studies examining activity-based embedded intervention support have found significant improvements in both teacher self-efficacy and children's social communication initiation and play engagement (28, 29). These approaches prove particularly effective when emphasizing practical application opportunities, constructive feedback mechanisms, and individually tailored strategies based on each child's unique communicative characteristics (30). Notwithstanding these insights, research specifically examining the interplay between knowledge, self-efficacy, attitudes, and organizational support within the unique cultural and educational context of Iraqi preschools remains notably scarce. Most existing investigations have been

conducted in Western countries with well-resourced educational infrastructures, leaving a critical gap in understanding how these dynamics function in developing nations or conflict-affected regions.

This study addresses this significant research gap by advancing beyond simple description to develop a predictive explanatory model. By integrating established psychological and organizational theoretical constructs, this investigation aims to provide a more nuanced and actionable understanding of the factors that drive effective communication support for children with autism in Iraqi preschool settings. The central hypothesis posits that teacher self-efficacy and perceived organizational support will emerge as more powerful predictors of evidence-based strategy implementation than general autism knowledge or attitudes towards inclusion, when all factors are considered simultaneously.

Materials and Methods

Study design

A cross-sectional correlational research design was employed to examine the relationships between teacher characteristics and their reported utilization of evidence-based communication strategies. The investigation was conducted across all government-operated kindergartens within Kerbala Governorate, Iraq, during the period from February to April 2026. This governorate was selected as it represents a diverse urban and semi-urban population with a substantial number of government preschools serving children from various socioeconomic backgrounds. A power analysis was conducted using G*Power software to determine the minimum required sample size for hierarchical multiple regression analysis. With a medium effect size ($f^2 = 0.15$), an alpha level of 0.05, a power of 0.95, and seven anticipated predictor variables, the analysis indicated a required sample size of at least 168 participants. To account for potential incomplete responses and non-participation, a target sample of 250 teachers was established. Then, a stratified random sampling technique was employed. Kindergartens were first stratified by administrative district within Kerbala Governorate. From each stratum, kindergartens were randomly selected in proportion to the number of teachers employed within each district. From each selected kindergarten, teachers were then randomly chosen using a computer-generated random number sequence. This approach ensured representation across all geographic areas and minimized selection bias. Teachers were eligible for inclusion if they: were employed full-time in government-operated kindergartens, were directly responsible for a classroom with a minimum of ten children, provided informed consent, and could complete the self-administered questionnaire independently. Consistent with the composition of the kindergarten teaching workforce in Iraq, only female teachers were included, as male teachers are not employed in government kindergartens. No exclusion criteria were applied regarding age, educational level, or years of professional experience. A total of 260 teachers were invited to participate. Of these, 243 provided complete and analyzable responses, yielding a response rate of 93.4%. The final sample size exceeded the minimum requirement determined by the power analysis, providing adequate statistical power for the planned regression analyses.

Instruments

Demographic and professional background. This questionnaire collected information on participants' age, years of teaching experience, educational level, marital status, family structure, and any prior formal training in special education or ASD. These variables were included as potential control variables in the regression analysis.

Knowledge of communication skills and ASD. This 20-item scale assessed teachers' knowledge of communication characteristics of ASD and evidence-based communication strategies. Items were developed through a multi-step process. First, an initial pool of 28 items was generated based on a review of the literature on autism communication interventions and the content of the original questionnaire used in the descriptive phase of this research. Second, content validity was assessed by a panel of five experts in special education, speech-language pathology, and early childhood education. Experts rated each item for relevance and clarity on a 4-point scale. Items with an Item-Content Validity Index (I-CVI) below 0.78 were revised or removed, resulting in a final 20-item scale with a Scale-Content Validity Index average (S-CVI/Ave) of 0.89. Example items included: "I know how to use visual supports like pictures and symbols to aid communication" and "I am aware of the stages of implementing the Picture Exchange Communication System." Responses were recorded on a three-point Likert scale: 1 = Not Known, 2 = Uncertain, and 3 = Known. Total raw scores could range from 20 to 60, with higher scores indicating greater knowledge. The scale demonstrated acceptable internal consistency in this study, with a Cronbach's alpha coefficient of 0.78. No factor analysis was conducted to examine the underlying factor structure of the scale, which is acknowledged as a limitation.

Teacher self-efficacy. Teachers' confidence in their ability to implement inclusive instructional practices was measured using the Teacher Efficacy for Inclusive Practices Scale, validated in Arabic by Alnahdi (31). This 18-item instrument comprises three subscales: Efficacy in Using Inclusive Instruction (six items), Efficacy in Collaboration (six items), and Efficacy in Managing Behavior (six items). For the purposes of this study, the Efficacy in Using Inclusive Instruction subscale was employed as the primary measure of self-efficacy, as it most directly addresses teachers' confidence in adapting instruction for diverse learners. Responses were recorded on a six-point Likert scale ranging from 1 = Strongly Disagree, to 6 = Strongly

Agree. Total raw scores could range from 6 to 36. The Cronbach's alpha coefficient for this subscale in the current sample was 0.82, indicating good internal consistency.

Attitudes towards inclusion. Teachers' attitudes towards the inclusion of children with disabilities in mainstream educational settings were assessed using the Multidimensional Attitudes Scale (MAS) toward persons with disabilities, which was validated in Arabic (32). The original MAS is a validated instrument assessing attitudes towards persons with disabilities in general contexts. To adapt the scale for the specific context of educational inclusion, the following modifications were made: (a) the term "persons with disabilities" was replaced with "children with disabilities" in all items; (b) the item "I would be comfortable living in the same house with a person with a disability" was replaced with "I would be comfortable having a child with a disability in my classroom"; and (c) two items were reworded to reference the school setting (e.g., "I would feel embarrassed if my friends saw me with a person with a disability" was changed to "I would feel embarrassed if other teachers saw me working closely with a child with a disability"). The adapted scale was reviewed by a panel of three experts in the fields of special education and educational psychology to confirm content relevance and clarity. All items were rated on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree, with higher scores indicating more positive attitudes towards inclusion. Total raw scores could range from 12 to 60. The Cronbach's alpha coefficient for this sample was 0.79, demonstrating acceptable internal consistency. It should be noted that the factor structure of the adapted scale was not examined in this study, and future research should confirm its psychometric properties in the educational context.

Perceived organizational support. Teachers' perceptions of the extent to which their school administration valued their contributions and demonstrated concern for their well-being were measured using the short eight-item version of Perceived Organizational Support scale, validated in Arabic (33). Items were adapted for the educational setting and included statements such as "My school administration really cares about my well-being" and "Help is available from the administration when I have a problem." Responses were recorded on a seven-point Likert scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. Total raw scores could range from 8 to 56. The Cronbach's alpha coefficient for this scale in the current sample was 0.91, indicating excellent internal consistency.

Evidence-based communication strategies. Scores on this ten-item scale served as the primary outcome variable for the study and it was developed specifically for this research. Item development followed a structured multi-phase process. First, an initial pool of 18 items was generated based on a comprehensive review of the literature on evidence-based communication interventions for children with autism, including visual supports, augmentative and alternative communication systems, naturalistic developmental behavioral interventions, and social skills training programs. Second, content validity was assessed by a panel of six experts, comprising specialists in special education, speech-language pathology, early childhood education, and autism intervention. Experts rated each item for relevance, clarity, and representativeness on a 4-point scale. Items with an Item-Content Validity Index (I-CVI) below 0.78 were revised or removed. This process yielded a final 10-item scale with a Scale-Content Validity Index average (S-CVI/Ave) of 0.91. Third, the scale was pilot tested with 25 kindergarten teachers (not included in the final sample) to assess clarity, comprehensibility, and time required for completion. Based on pilot feedback, minor wording modifications were made to three items to enhance clarity. The final ten items assess the frequency with which teachers implement specific evidence-based communication strategies: use of visual schedules (two items), provision of adequate processing time or wait-time (one item), incorporation of communication opportunities into daily routines (two items), use of social stories (two items), use of augmentative and alternative communication supports (two items), and implementation of positive reinforcement techniques (one item). Responses are recorded on a five-point frequency scale ranging from 1 = Never to 5 = Always. Total raw scores range from 10 to 50, with higher scores indicating more frequent strategy use. The scale demonstrated excellent internal consistency in this sample, with a Cronbach's alpha coefficient of 0.89. No factor analysis was conducted to examine the scale's underlying structure, which is acknowledged as a limitation.

Procedures

Following the acquisition of necessary administrative approvals from the Kerbala Governorate Education Directorate and the Research Ethics Committee, the researcher contacted the principals of selected kindergartens to arrange data collection visits. Prior to data collection, the purpose of the study was explained to all potential participants, and informed consent was obtained. Participants were assured that their responses would remain strictly anonymous and confidential and that they could withdraw from the study at any time without penalty. The questionnaire was self-administered, with the researcher present to clarify any questions or ambiguities that might arise. This approach was adopted to minimize the likelihood of incomplete responses and ensure consistent interpretation of items across participants. The researcher also ensured that participants completed the questionnaire independently without conferring with colleagues. Data collection was completed over a five-week period from February to March 2026.

Statistical analysis

Data were analyzed using IBM SPSS Statistics for Windows, Version 28.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated to summarize participants' demographic characteristics and responses to the study measures. Total raw scores were computed for each scale by summing the individual item responses, providing a transparent representation of participants' actual scores. Prior to conducting inferential analyses, the assumptions of parametric statistical tests were examined. Normality was assessed through examination of skewness and kurtosis values and confirmed through visual inspection of Q-Q plots. Homoscedasticity and linearity were evaluated through scatterplot examination. Multicollinearity among predictor variables was assessed using variance inflation factor (VIF) values, with all values falling below the threshold of 10, indicating no problematic multicollinearity. For the primary analysis, a hierarchical multiple regression was performed to identify significant independent predictors of teachers' use of evidence-based communication strategies. Variables were entered in four sequential steps to assess the incremental contribution of each block of predictors. In Step 1, demographic control variables (age, education, and professional experience) were entered. In Step 2, knowledge about ASD and communication skills was added. In Step 3, teacher self-efficacy and attitudes towards inclusion were entered. In the final Step 4, perceived organizational support was added to the model. A p-value of less than 0.05 was considered statistically significant for all analyses.

Ethical Considerations

The study received ethical approval from the Institutional Review Board of the College of Nursing, University of Kerbala, and from the Ethics Committee of Constantine the Philosopher University in Nitra, Slovakia (Approval No. UKF/917/131013:002). All procedures were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Participation was entirely voluntary, and written informed consent was obtained from all participants prior to data collection. Participants were informed of their right to withdraw from the study at any point without consequence. Anonymity and confidentiality were rigorously maintained throughout all phases of the research, and all data were used exclusively for scientific purposes.

Results

The final analytical sample comprised 243 kindergarten teachers. As shown in Table 1, the mean age of participants was 41.2 years (SD = 8.9). The majority of teachers (78.0%, n = 190) held a Bachelor's degree as their highest educational qualification, while 20.2% (n = 49) held a high school diploma, and 1.6% (n = 4) had completed postgraduate studies. The mean professional teaching experience was 12.7 years (SD = 9.1). Most participants resided in urban areas (91.0%, n = 221), and nearly all were married (98.0%, n = 238). Prior formal training in special education or ASD was reported by only 18.0% (n = 44) of the teachers.

Table 1. Demographic and Professional Characteristics of Participating Kindergarten Teachers (N = 243)

Characteristic	Category	Frequency (n)	Percentage (%)
Age (years)	23 – 30	49	20.2
	31 – 38	55	22.6
	39 – 46	76	31.3
	47 – 54	39	16.0
	55 – 62	24	9.9
	Mean (SD)	41.2 (8.9)	
Educational Level	Diploma	49	20.2
	Bachelor's Degree	190	78.0
	Postgraduate Degree	4	1.6
Professional Experience (years)	1 – 8	149	61.3
	9 – 16	61	25.1
	17 – 24	15	6.2
	25 – 32	18	7.4
	Mean (SD)	12.7 (9.1)	

Characteristic	Category	Frequency (n)	Percentage (%)
Residence	Urban	221	91.0
	Rural	22	9.0
Marital Status	Married	238	98.0
	Single	5	2.0
Family Type	Nuclear Family	194	79.8
	Extended Family	24	9.9
	Single Parent Family	25	10.3
Family Size (members)	1 – 3	134	55.1
	4 – 6	91	37.4
	7 – 9	18	7.4
Prior Formal Training in Special Education or ASD	Yes	44	18.0
	No	199	82.0

Table 2 presents the descriptive statistics for the main study variables, including total raw scores. Participants demonstrated a moderate level of knowledge regarding communication skills for children with ASD, with a mean total score of 49.60 (SD = 8.40) on a scale ranging from 20 to 60. Teacher self-efficacy scores averaged 28.50 (SD = 4.68) on the six-item subscale measuring efficacy in inclusive instruction, with a possible range of 6 to 36. Attitudes towards inclusion were relatively positive, with a mean score of 47.04 (SD = 6.96) on a scale ranging from 12 to 60. Perceived organizational support scores were notably lower, with a mean of 25.76 (SD = 8.08) on a scale ranging from 8 to 56, indicating that teachers perceived only moderate support from their school administrations. The self-reported frequency of using evidence-based communication strategies averaged 31.50 (SD = 9.20) on a scale ranging from 10 to 50.

Table 2. Descriptive Statistics for Main Study Variables in Participating Kindergarten Teachers (N = 243)

Variable	Items	Possible Range	Mean	Standard Deviation	Observed Range	Cronbach's α
ASD Knowledge	20	20 – 60	49.60	8.40	25 – 60	0.78
Teacher Self-Efficacy	6	6 – 36	28.50	4.68	13 – 36	0.82
Attitudes Towards Inclusion	12	12 – 60	47.04	6.96	24 – 60	0.79
Perceived Organizational Support	8	8 – 56	25.76	8.08	8 – 51	0.91
Use of Evidence-Based Strategies	10	10 – 50	31.50	9.20	11 - 50	0.89

Table 3 presents the Pearson correlation coefficients examining the bivariate relationships between the study variables. All variables demonstrated statistically significant positive correlations with the use of evidence-based communication strategies. The strongest correlation was observed between teacher self-efficacy and strategy use ($r = 0.48$, $P < 0.01$), followed by perceived organizational support ($r = 0.45$, $P < 0.01$), attitudes towards inclusion ($r = 0.30$, $P < 0.01$), and knowledge ($r = 0.29$, $P < 0.01$). Professional experience also showed a significant positive correlation with strategy use ($r = 0.26$, $P < 0.01$). Among the predictor variables, self-efficacy demonstrated moderate positive correlations with knowledge ($r = 0.38$, $P < 0.01$), attitudes ($r = 0.42$, $P < 0.01$), and perceived organizational support ($r = 0.35$, $P < 0.01$).

Table 3. Bivariate Correlations between Main Study Variables Participating Kindergarten Teachers (N = 243)

Variable	1	2	3	4	5	6
1. Use of Evidence-Based Strategies	1.00					
2. ASD Knowledge	0.29**	1.00				
3. Teacher Self-Efficacy	0.48**	0.38**	1.00			

Variable	1	2	3	4	5	6
4. Attitudes Towards Inclusion	0.30**	0.31**	0.42**	1.00		
5. Perceived Organizational Support	0.45**	0.21*	0.35**	0.22*	1.00	
6. Professional Experience (Years)	0.26**	0.18*	0.20*	0.15*	0.18*	1.00

Note: **P < 0.01, *P < 0.05 (two-tailed).

A hierarchical multiple regression was conducted to determine the unique contribution of each predictor variable to the use of evidence-based communication strategies. Prior to interpreting the regression results, all assumptions were examined and all criteria were successfully met. Multicollinearity was assessed using VIF values; all VIF values were below 1.5, well below the recommended threshold of 10, indicating no problematic multicollinearity among predictors. Tolerance values ranged from 0.72 to 0.91, all above the acceptable threshold of 0.20. The Durbin-Watson statistic was 1.94, within the acceptable range of 1.5 to 2.5, indicating no significant autocorrelation in the residuals. Visual inspection of normal probability plots and histograms of standardized residuals suggested that residuals were approximately normally distributed, supported by a non-significant Shapiro-Wilk test (W = 0.99, P = 0.21).

The results of the hierarchical multiple regression are summarized in Table 4. The demographic control variables (age, education, and professional experience) were entered first. This model was statistically significant (F (3, 239) = 7.42, P < 0.01) and accounted for 8% of the variance in strategy use (R^2 = 0.08). Professional experience emerged as the only significant individual predictor in this step (β = 0.24, P < 0.05), while age and education were not statistically significant. Adding knowledge about ASD and communication skills to the model did not significantly increase the explained variance (ΔR^2 = 0.02, P = 0.08). Knowledge was not a significant predictor in this step (β = 0.12, P = 0.12), suggesting that general knowledge alone does not substantially contribute to predicting teachers' use of evidence-based strategies beyond what is explained by demographic characteristics. The addition of teacher self-efficacy and attitudes towards inclusion significantly improved the model, explaining an additional 28% of the variance (ΔR^2 = 0.28, P < 0.001). Self-efficacy emerged as a strong, significant predictor (β = 0.38, P < 0.001). Notably, attitudes towards inclusion were not significant (β = 0.08, P = 0.23), indicating that while attitudes correlate with strategy use at the bivariate level, they do not contribute unique predictive power when self-efficacy is controlled. Adding perceived organizational support to the model in the final step was also significant, adding another 4% to the variance explained (ΔR^2 = 0.04, P < 0.01). The final model was highly significant (F (7, 235) = 25.32, P < 0.001) and accounted for 42% of the variance in the use of evidence-based communication strategies (Adjusted R^2 = 0.42). In the final model, three variables emerged as significant independent predictors: teacher self-efficacy (β = 0.35, P < 0.001), perceived organizational support (β = 0.28, P < 0.01), and professional experience (β = 0.22, P < 0.05). General knowledge about ASD (β = 0.06, P = 0.12) and attitudes towards inclusion (β = 0.05, P = 0.23) were not significant predictors.

Table 4. Summary of Hierarchical Regression Analysis Predicting Teachers' Use of Evidence-Based Communication Strategies (N = 243)

Variable	Step 1 β SE (t-value)	Step 2 β SE (t-value)	Step 3 β SE (t-value)	Step 4 β SE (t-value)
Age	0.10 0.07 (1.43)	0.08 0.07 (1.14)	0.05 0.06 (0.83)	0.04 0.06 (0.67)
Education	0.06 0.06 (1.00)	0.05 0.06 (0.85)	0.03 0.05 (0.60)	0.02 0.05 (0.40)
Professional Experience	0.24* 0.10 (2.40)	0.22* 0.11 (2.20)	0.19 0.09 (2.11)	0.22* 0.09 (2.44)
ASD Knowledge	-	0.12 0.08 (1.51)	0.08 0.07 (1.14)	0.06 0.07 (0.86)
Teacher Self-Efficacy	-	-	0.38** 0.06 (4.52)	0.35** 0.05 (4.11)
Attitudes Towards Inclusion	-	-	0.08 0.07 (1.15)	0.05 0.06 (0.73)

Variable	Step 1 β SE (t-value)	Step 2 β SE (t-value)	Step 3 β SE (t-value)	Step 4 β SE (t-value)
Perceived Organizational Support	-	-	-	0.28** 0.06 (3.67)
R^2	0.08	0.10	0.38	0.42
ΔR^2	0.08**	0.02	0.28**	0.04**
F for ΔR^2	7.42**	2.86	45.21**	10.32**

Note: **P < 0.01, *P < 0.05. β values represent standardized regression coefficients. SE = Standard error. Overall F for Step 2: F(5, 237) = 6.15; Step 3: F(7, 235) = 18.75; Step 4: F(7, 235) = 25.32.

Discussion

This study represents a significant advancement over previous descriptive research by investigating a comprehensive predictive model of factors influencing kindergarten teachers' use of evidence-based communication strategies for children with ASD in an Iraqi context. The findings provide strong empirical support for moving beyond simplistic assumptions that knowledge alone determines practice. Our results demonstrate that while a basic level of knowledge is important, the translation of that knowledge into classroom action is powerfully mediated by teachers' beliefs in their own capabilities and the quality of support they receive from their school administration. This finding is consistent with the results of previous studies highlighting teachers' self-efficacy in educating autistic students (34, 35). Our findings showed that teachers who expressed a strong conviction in their ability to implement inclusive instructional strategies were significantly more likely to report using evidence-based communication techniques. This aligns with social cognitive theory and a growing body of literature in special education (36, 37). Research examining activity-based embedded intervention support has similarly found significant improvements in teacher self-efficacy following targeted professional development (29). For a teacher with high self-efficacy, a student's challenging communication behavior is not seen as a frustrating obstacle but as a problem to be solved. They are more likely to persist, try novel strategies like the picture exchange communication system (38) or social stories (39), and adapt their communication style. This finding has also direct implications for professional development. Professional development programs that are purely lecture-based and focused on theory may increase knowledge but do little to build self-efficacy (40). Effective professional development for this context must incorporate hands-on practice, opportunities for collaborative problem-solving, and coaching where teachers can practice strategies with real children and receive constructive, immediate feedback. This kind of mastery experience is the most powerful source of self-efficacy, as it provides teachers with tangible evidence of their capability to bring about positive change (41).

Closely following self-efficacy is the significant contribution of perceived organizational support. Teachers working in supportive environments where they perceive that their administration understands the challenges of working with children with autism, provides the necessary resources, and offers emotional and professional backing are much more likely to implement effective practices. Research has demonstrated that on-site coaching and organizational support are instrumental in building teacher competence and confidence (42). This finding is particularly crucial in a resource-constrained setting like Iraq, suggesting that systemic-level changes are just as important as individual-level training. School leaders must actively foster a culture of support, which might involve ensuring that special education specialists or counselors are available for consultation, reducing class sizes to allow for more individualized interaction, creating time for peer collaboration and shared planning, and publicly recognizing the efforts of teachers working in these demanding roles.

Professional experience also emerged as a significant, independent predictor. This supports the idea that learning by doing is a critical pathway to competency (43). Teachers with more years of experience have likely encountered a wider range of behaviors, developed their own informal strategies through trial and error, and perhaps received more on-the-job mentoring. This highlights the potential benefit of pairing less experienced teachers with veteran mentors to facilitate the transmission of tacit knowledge that is not easily codified in textbooks. Most importantly, the study confirmed that general knowledge about ASD and attitudes towards inclusion were not significant predictors when the other more powerful factors were controlled in the regression model. While knowledge and positive attitudes are certainly desirable and correlate with good practice, they are not the primary drivers. A teacher can be well-informed and hold a highly positive, inclusive philosophy; however, without the practical confidence and the resources and

administrative backing to translate their philosophy into action, they are unlikely to effectively use complex, evidence-based strategies (44). This is a crucial nuance: knowing what to do is different from knowing how to do it, and from being supported to do it (45).

The non-significant contribution of knowledge in Step 2 ($\Delta R^2 = 0.02$, $P = 0.08$) warrants careful interpretation. Several factors may explain this finding. First, the knowledge scale assessed general declarative knowledge but did not measure procedural knowledge (knowing how to implement strategies) or conditional knowledge (knowing when to apply them). Second, the moderate mean score reflects a restricted range that may have attenuated the associations. Third, knowledge may be a necessary but insufficient condition for effective practice. As Bandura's social cognitive theory posits, knowledge alone does not guarantee behavior change; self-efficacy beliefs mediate the translation of knowledge into action by influencing whether individuals attempt, persist in, and successfully execute specific behaviors (46). This interpretation is supported by the substantial increase in explained variance when self-efficacy was added in Step 3 ($\Delta R^2 = 0.28$). Fourth, the measure may have been too broad, assessing general autism knowledge rather than specific actionable knowledge directly relevant to the communication strategies measured in the outcome scale. Future research should employ more nuanced measures distinguishing declarative, procedural, and conditional knowledge, and assess knowledge of the specific strategies being measured.

Limitation

This study has several limitations that should be acknowledged. First, the cross-sectional design prevents establishing causal relationships. While we have identified significant predictors of strategy use, we cannot determine the causal direction: whether self-efficacy and organizational support promote strategy use or whether strategy use enhances self-efficacy. Longitudinal research would be valuable to examine these causal pathways. Second, all measures were self-reported, making them subject to social desirability bias. Teachers might over-report their use of strategies or their self-efficacy. Future research should incorporate observational methods to verify teacher practice, such as structured classroom observations or video analysis of teacher-child interactions. Third, the study was limited to female teachers in one Iraqi governorate, which restricts the generalizability of findings to other regions or to male teachers. Future research should expand the sample geographically to include other governorates and, where applicable, male teachers in other educational settings. Fourth, while the final model explained a substantial 42% of the variance in strategy use, 58% remains unexplained. Future studies should explore other potential factors, such as teachers' emotional intelligence, the specific characteristics of the children with autism in their classrooms (e.g., severity of communication deficits), the availability of specialized support personnel, and the nature of the family-school partnership. Fifth, the heterogeneity of ASD prevalence estimates across the Middle East and North Africa region suggests that cultural and contextual factors may influence both teacher preparedness and the availability of support services. Future research should explore these cultural dimensions more deeply through mixed-methods approaches that combine quantitative surveys with qualitative interviews to capture the lived experiences of teachers in diverse settings. Sixth, the knowledge, MAS, and communication strategies scales used in this study, while content-validated, were not subjected to factor analysis to confirm their underlying structure. Although the scales demonstrated acceptable internal consistency, future research should examine their factorial validity through confirmatory factor analysis in independent samples.

Conclusion

This study conclusively demonstrates that effective communication support for children with autism in inclusive preschool classrooms is not simply a matter of teachers' knowledge. It is a multi-faceted process driven by a complex interplay of individual and organizational factors. Teacher self-efficacy and perceived organizational support emerged as the strongest independent predictors of evidence-based strategy use, while general knowledge and attitudes towards inclusion did not retain predictive power when these factors were controlled. This finding has profound implications for policymakers, school administrators, and teacher training institutions. To improve the quality of inclusive education in Iraq and similar contexts, a dual-pronged approach is necessary. First, invest in high-quality, experiential professional development that builds teacher self-efficacy through practice, not just theory. Such programs should incorporate hands-on activities, coaching, and opportunities for collaborative problem-solving. Second, and equally important, cultivate a supportive organizational culture where administrators provide the resources, encouragement, and recognition that teachers need to thrive in their demanding roles. By addressing both the individual and the system, we can ensure that all children, regardless of their neurodevelopmental profile, have the opportunity to communicate, connect, and learn.

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Conflict of Interest
None.

Author's Contributions
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