https://doi.org/10.37420/j.ssp.2025.007

A Multi-Dimensional Analysis of Preschoolers' Physical and Mental Health Promotion from the Perspective of Home-Preschool Synergistic Education

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Abstract
China attaches great importance to physical and mental health education for preschool children; however, physical and mental health issues among adolescents and children continue to exhibit a younger trend. From the perspective of home-preschool co-education, this study adopts a questionnaire survey (involving 238 parents and 207 teachers in the Beijing-Tianjin-Hebei region of China) and interview method, combined with SPSS data analysis, to investigate the current status of physical and mental health education for preschool children.The results show that: parents actively pay attention to children's physical health but have low participation, lack systematic professionalism in resource acquisition, and their attention to physical health is roughly equal to that to mental health; preschools are equipped with relatively abundant mental health resources and competent teachers, yet have insufficient resources for physical health education; while home-preschool co-education takes diverse forms, in-depth collaboration between the two parties is lacking. Family economic status, parental attitudes, and exercise habits influence physical health education, whereas parental educational background, family income, and children's gender affect mental health education.Accordingly, this study proposes the following recommendations: the state should improve policy resources; parents should enhance their participation awareness; preschools should strengthen teacher training and home-preschool cooperation; teachers should improve their professional literacy; and home and preschool should establish effective communication mechanisms.

Keywords
Preschool Children; Physical and Mental Health; Home-Preschool Co-Education; Physical Health; Mental Health

1 Introduction

With the improvement of national living standards, the importance of physical and mental health for preschool children has received increasing attention. China's Guidelines for the Learning and Development of Children Aged 3-6 Years has ranked health as the top of the five core areas, explicitly emphasizing the core value of young children's physical fitness and emotional development (Ministry of Education of the People's Republic of China, 2012). However, in reality, physical and mental health issues among adolescents and children are showing a younger trend. The 2022 China Children's Healthy Growth White Paper indicates that myopia and spinal problems are highly prevalent and increasingly affecting younger age groups among Chinese adolescents and children, with nearly 70% of children suffering from spinal issues. A survey of over 20,000 primary and secondary school students by the China Youth and Children Research Center found that the detection rates of anxiety and depression symptoms reached 31.3% and 17.9%, respectively, highlighting the severity of adolescents' physical and mental health status and the urgency of early identification and intervention (iResearch Consulting Group, 2022; China Youth and Children Research Center, 2022).

Countries around the world have formulated policies and established evaluation systems to improve adolescents' physical fitness, such as FITNESSGRAM in the United States, KIGGS in Germany, Russia's Ready for Labor and Defense System (GTO), and Japan's Physical Fitness and Athletic Ability Test (Xiong, 2020). Research on physical fitness of young children in China began in the late 1970s, and multiple rounds of investigations have gradually confirmed that the age of 3-6 is a critical period for physical development. Currently, problems such as poor physical health of adolescents, low physical fitness of college students, and the younger trend of adolescent mental health issues persist (Zhang et al., 2012). Most relevant domestic studies focus on test data analysis and countermeasure proposal, with insufficient exploration of the correlation mechanisms between physical health and multiple fields (Wu et al., 2021). In the field of mental health, the state has strengthened support through policies such as the Guidelines for Mental Health Education in Primary and Secondary Schools (Revised 2012). The publicity theme of the 2023 World Mental Health Day has further elevated children's mental health to the national strategic level (Department of Medical Administration, 2023; National Health Commission of the People's Republic of China, 2023). Academic circles emphasize implementation approaches such as personalized educational strategies and home-preschool collaboration, including activity infiltration, environmental edification, inclusive education, process evaluation, and personality counseling, which should focus on long-term development (Miao, 2004; Zhang, 2003). However, the practical implementation still needs improvement.

Family and preschool, as core environments for preschool children's growth, their collaborative education is crucial for physical and mental health. Studies have shown that family environments, including economic status, parental educational background, and exercise habits, directly affect young children's physical fitness and emotional development (Cui, 2020; Xu, 2021; Sun, 2023). The quality of preschool environments and teachers' professional literacy are key guarantees for the implementation of education (Li, 2023; Wang, 2020). However, existing studies have not fully clarified the specific mechanism of home-preschool co-education in physical and mental health education, and practical problems such as unclear cooperation paths and insufficient collaborative effectiveness remain.

Accordingly, this study explores the cognitive status of physical and mental health education for preschool children and the practice of home-preschool cooperation from the dual perspectives of preschool teachers and parents. It aims to provide theoretical support and practical schemes for home-preschool co-education and enrich the theoretical system of physical and mental health education for preschool children.

2 Literature Review

Studies have shown that besides the influence of education itself, the effectiveness of physical and mental health education for preschool children is shaped by multiple external factors, among which family and kindergarten environments are core variables. At the family level, Xu & Yu (2008) pointed out that family environment and educational background are key determinants of preschool children's physical fitness, functioning specifically through parents' physical activity status, attitudes toward sports, and family sports environment. Regarding mental health, a survey by Xu (n.d.) indicated that children of parents with occupations such as teachers and civil servants are more prone to mental health issues. Further evidence from Xu (2021) and Sun (2023) confirmed that parental education level, occupation, income, and other factors significantly affect the development of children's emotional competence (Cui, 2020; Wen & Cai, 2023; Xu, 2021; Sun, 2023). At the kindergarten level, physical health is positively influenced by environmental factors such as physical facilities, organizational policies, and teachers' attitudes—with more complete facilities correlating with higher levels of children's physical fitness. Mental health, by contrast, relies on teachers' professional knowledge and practical experience, and teachers' own psychological states also directly impact children's development, requiring kindergartens to provide synchronous psychological support for teachers (Li, 2023; Wang, 2008).

The design and implementation of this study are supported by Bronfenbrenner's Ecological Systems Theory and Erikson's Psychosocial Development Theory. Bronfenbrenner's Ecological Systems Theory posits that preschool children's development is influenced by microsystems (e.g., family, kindergarten) and mesosystems (e.g., family-kindergarten interactions), where the quality of family-kindergarten collaboration plays a critical role in developmental outcomes (Bronfenbrenner, 1979). Erikson's Psychosocial Development Theory defines the preschool stage (3-6 years old) as the "initiative vs. guilt stage," emphasizing that education during this period should respect children's autonomy, encourage exploratory behavior, and lay the foundation for their social participation and creativity. It also suggests that educators should adjust strategies according to the characteristics of this developmental stage (Wang, 2000).

Clear conceptual definition is the foundation of research. Combining the research theme and previous studies, the core concepts are defined as follows:

Physical health: A state of physical and mental freedom from illness, sound morphological development, and stable emotions and will, serving as the material basis of health (He, 2001).

Physical health of preschool children: The performance of 3-6-year-old children in terms of body shape, physical fitness, growth and development, motor skills, and health status (Luo, 2021).

Mental health: A positive state characterized by the absence of mental illness, sound personality traits, emotional stability, and social adaptability (Zhang, 2011; 22 Ministries and Commissions, 2017).

Mental health of preschool children: A state where 3-6-year-old children have no obvious mental health issues, maintain emotional stability, develop healthy interpersonal relationships, and adapt to environmental changes (Sun, 2011).

Mental health education for preschool children: Educational activities that promote the development of children's emotions, personality, and volitional qualities in accordance with their developmental laws (Yao & Deng, 2004).

Home-preschool co-education: Educational practices where kindergartens and families collaborate, integrate resources, and jointly influence children's physical and mental health (Li, 2020; Wang, 2015).

3 Research Methods

This study adopted a sequential explanatory mixed-methods research design. First, quantitative data were collected through questionnaire surveys to clarify the overall characteristics of physical and mental health education for preschool children. Then, qualitative data were supplemented via semi-structured interviews to deepen the results, balancing the breadth and depth of the research.

As a core economic, political, and cultural region in China and a key pilot area for the national regional coordinated development strategy, the Beijing-Tianjin-Hebei region's social development level and educational resource allocation can represent China's overall characteristics and hold strong reference value for similar domestic regions. Therefore, parents and teachers from preschools in this region were selected as research participants: A total of 280 parent questionnaires were distributed, with 238 valid ones recovered (effective response rate of 95%). The sample was dominated by only children (56.30%) aged 3–4 years (37.82%), with 37.82% of parents holding bachelor's degrees and 52.94% of children attending public preschools. For teacher questionnaires, 231 were distributed and 207 valid ones were retrieved (effective response rate of 89.6%). The teacher sample included 73.43% females, 41.55% aged 26–35 years, 74.4% with preschool education backgrounds, 55.56% holding bachelor's degrees, and 50.72% working in public preschools. On this basis, 5 parents and 5 teachers were purposefully selected from questionnaire respondents for interviews, covering diverse backgrounds to ensure sample representativeness.

Research instruments included self-designed questionnaires and interview outlines, both subjected to rigorous psychometric testing. Separate parent and teacher sub-questionnaires were developed for physical health education and mental health education respectively: The parent questionnaire on physical health education consists of 28 items covering three dimensions—family basic information, cognition and practice, and home-preschool co-education—while the teacher questionnaire includes 17 items across three dimensions: teacher information, cognition, and home-preschool co-education. The mental health education questionnaires were developed with reference to the National Guidelines for Early Childhood Education (3-6 Years Old) and existing empirical tools, revised based on a pre-survey before finalization. The parent

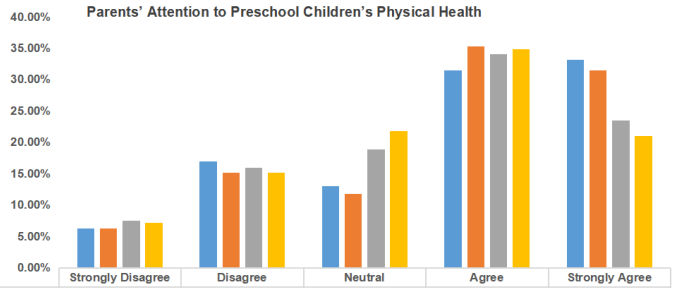
version contains 19 items and the teacher version 15 items, both encompassing dimensions of basic information, educational practice, and home-preschool co-education. Psychometric results showed that the Cronbach's α coefficients were 0.914 for the parent questionnaire and 0.888 for the teacher questionnaire, both exceeding the acceptable threshold of 0.7 for good reliability. For validity, the KMO values were 0.924 for the parent questionnaire and 0.884 for the teacher questionnaire, with Bartlett's test of sphericity reaching significant levels ($p<0.001$) in both cases, indicating sufficient construct validity. The interview outlines were designed based on the core dimensions of the questionnaires, with 11 items per field covering cognition of physical and mental health education, resource constraints, and home-preschool collaboration.

Questionnaires were distributed via online platforms, and valid data were screened based on completeness of responses and consistency of answers. Interviews were conducted in telephone or face-to-face formats according to respondents' preferences, lasting 30–40 minutes each. Recordings were made with informed consent and transcribed verbatim into textual data. Data analysis integrated quantitative and qualitative approaches: Questionnaire data were analyzed using SPSS 25.0 for descriptive statistics, Pearson correlation analysis, and cross-tabulation analysis to present current status distribution, explore variable correlations, and identify subgroup differences. Interview data were analyzed through thematic analysis, coded independently by two researchers (Cohen's $\kappa=0.87$ to ensure coding consistency). Core themes were extracted, typical cases were selected, and triangulation with quantitative results was conducted to ensure the reliability and explanatory power of the conclusions.

4 Research Results and Analysis

4.1 Parents' Cognition and Practical Characteristics Regarding Children's Physical and Mental Health

First, there is a awareness-practice gap dissonance between parents' attention to and participation in children's physical health. Over half of the parents showed active attention to preschool children's physical health (see the top panel of Figure 1), with 76.89% willing to participate in physical health-related activities and 42.86% proactively expressing participation intentions. However, 66.18% of teachers identified "insufficient parental participation" as the top area for improvement, and only 2 parents mentioned proactively participating in such activities during interviews—reflecting a significant gap between parents' cognition, intentions, and actual behaviors.



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Monitor child's physical condition	6.30%	16.97%	13.03%	31.51%	33.19%
Very supportive of children's physical activities	6.30%	15.13%	11.76%	35.29%	31.51%
Schedule Fixed Time for Physical Exercise	7.56%	15.97%	18.91%	34.03%	23.53%
Exercise Regularly with the Child	7.14%	15.13%	21.85%	34.87%	21.01%

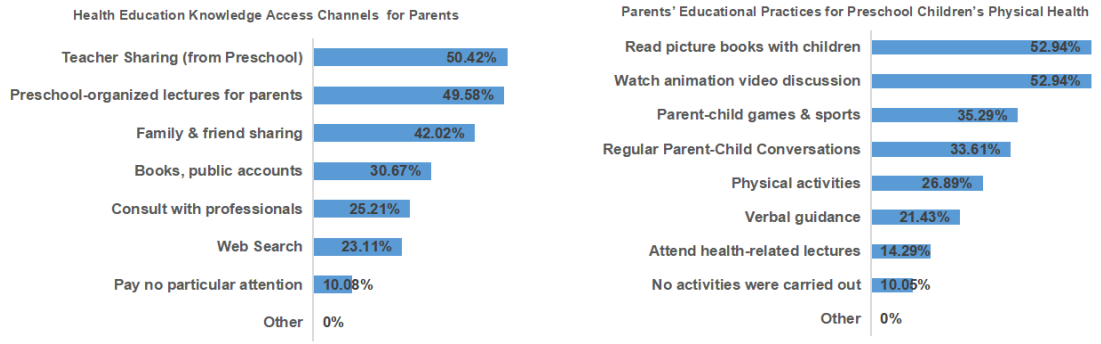


Figure 1 Parents' attention to preschool children's physical health, access channels of health education knowledge, and corresponding educational practices

Notes: For the "Attention" sub-figure, the x-axis represents response levels (from Strongly Disagree to Strongly Agree) for 4 parent-related items: (1) monitor child's physical condition; (2) support children's physical activities; (3) schedule fixed time for physical exercise; (4) exercise regularly with the child. The "Access Channels" and "Educational Practices" sub-figures present the percentage distribution of parents' choices, sorted by descending percentage.

Second, parents' acquisition of educational resources and practical methods lacks systematicity and professionalism. Resource access mainly relies on preschool teachers' sharing (50.42%), kindergarten lectures (49.58%), and communication with family and friends (42.02%), indicating a strong dependence on preschools' professional resources. Educational practices are mostly random approaches such as reading picture books, telling stories, and watching videos—methods that are easy to integrate into daily life but lack systematicity and continuity. In response to mental health issues, 57.79% of parents adopted neutral approaches (e.g., laissez-faire, reliance on teachers) when facing their children's psychological problems, while only 42.21% chose supportive responses such as active communication and guided problem-solving. Particularly when children "failed to adapt to the new kindergarten environment," supportive responses accounted for only 31.36%, significantly lower than neutral responses (68.64%), highlighting parents' weak awareness of providing psychological support during the new environment adaptation stage.

Third, parents' attention to physical health and mental health is generally balanced. Data show that parents' mean score for attention to physical health was 3.69 (weight: 50.114%), while the mean score for mental health was 3.68 (weight: 49.886%), with no significant difference between the two. Drawing on the research of Eisenberg et al. on "the impact of parental responses to children's emotional and behavioral problems," this study divided parental responses to preschool children's mental health problem behaviors into supportive responses (including active communication, guided analysis and problem-solving, and seeking third-party help) and neutral responses (including laissez-faire, direct notification, and leaving the issue to teachers). When facing such behaviors, 57.79% of parents chose neutral approaches, and 42.21% opted for supportive ones. Specifically, when children "had conflicts" or "showed negative emotions," supportive responses accounted for 46.76% and 48.52% respectively—with little gap from neutral responses. However, when children "failed to adapt to the new kindergarten environment," only 31.36% of parents provided supportive responses, compared to 68.64% of neutral responses.

The above data indicate that in the mental health dimension, parents paid the highest attention to interpersonal communication (mean score: 3.77), followed by emotional control (3.66), while social adaptation and self-cognition both scored 3.64. Interview results confirmed this characteristic: 4 parents explicitly focused on their children's physical and mental health, all 5 teachers reported that parents valued children's physical health (e.g., diet, exercise) and peer interactions at kindergarten, and 2 teachers mentioned that parents of newly enrolled children paid additional attention to emotional issues and adaptation—consistent with the data analysis conclusions.

4.2Teachers' Perspectives on the Implementation Status of Physical and Mental Health Education in Preschools

In terms of physical health education, preschools show high attention but insufficient resource supply. Preschool teacher questionnaire results indicate that over 80% of preschool teachers can accurately grasp the physical health status of children in their classes and continuously support their physical exercise (see the top panel of Figure 2). However, "lack of adaptable educational resources" is the top issue faced by preschool teachers—4 interviewed preschool teachers mentioned specific predicaments such as insufficient resource quantity, low usage frequency, lack of innovation, and single access channels.

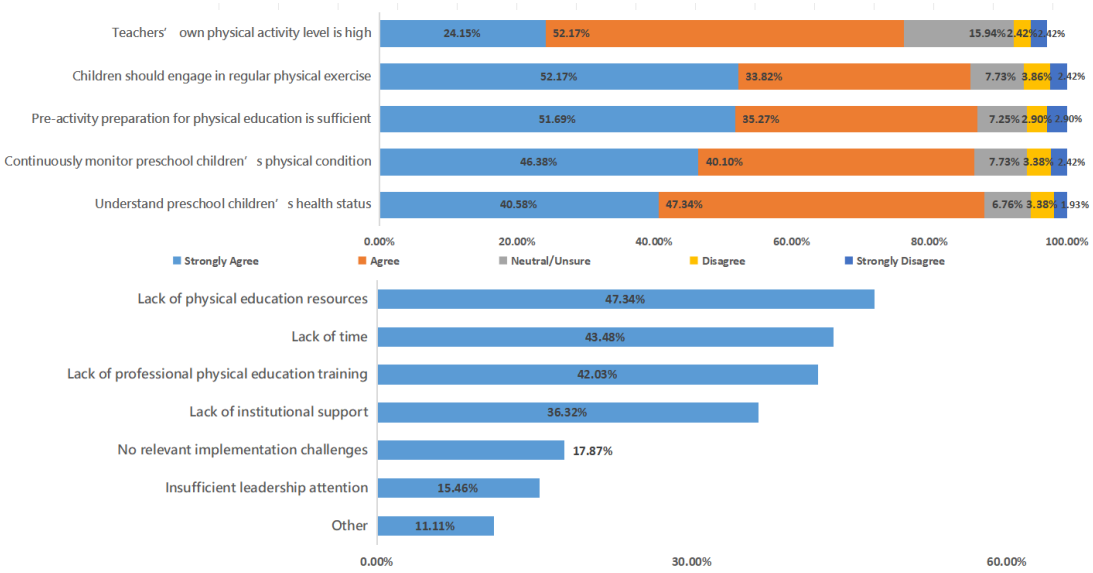


Figure 2 Teachers' Attitudes Toward Preschool Children's Physical Health Education and Corresponding Implementation Challenges

Notes: The top panel illustrates teachers' attitudes toward preschool children's physical health education, measured via a 5-point Likert scale (response levels: Strongly Agree, Agree, Neutral/Unsure, Disagree, Strongly Disagree). The bottom panel presents the percentage distribution of challenges encountered by teachers during physical health education implementation, ordered by descending percentage.

In terms of mental health education, resource allocation is relatively comprehensive, and preschool teachers have strong professional capabilities. Over 60% of preschools provide preschool teachers with mental

health education resources such as expert training and online courses (see the left panel of Figure 3), and more than 50% adopt diversified educational approaches including environmental edification and individual counseling (see the right panel of Figure 3). Meanwhile, 57% of preschools share educational resources with parents, and 31.4% conduct parent guidance and training to strengthen home-preschool co-education. Preschool teachers' self-assessment data (5-point Likert scale) show that the mean score of their professional knowledge in mental health education reaches 4.02, and the mean score of willingness to continuous learning is 4.25. Their professional reserves and learning enthusiasm provide support for preschool children's mental health education, but the training content and practical guidance still need optimization.

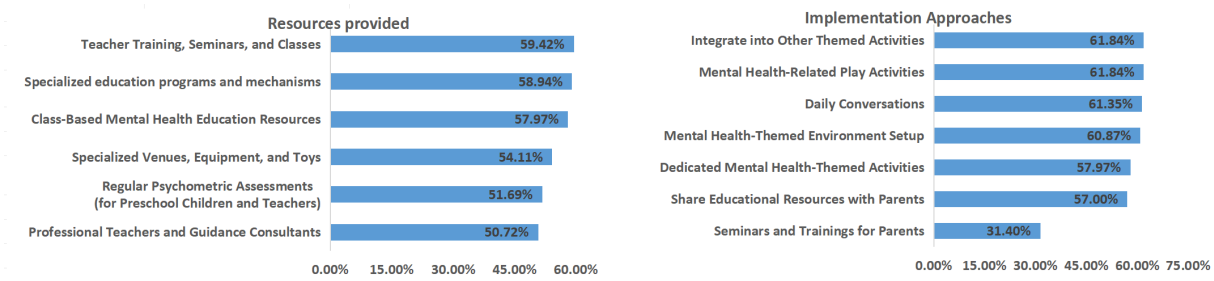


Figure 3 Resources and Implementation Approaches for Preschool Mental Health Education

Notes: The left panel lists resources provided for preschool mental health education; the right panel presents implementation approaches for preschool mental health education, with percentages indicating the adoption rate of each item.

Home-preschool co-education activities are diverse in form, but there is little interactivity and in-depth cooperation. The overall communication frequency between preschool teachers and parents is medium to low, and it is mainly dominated by group communication. Due to time constraints, personalized communication during pick-up and drop-off periods is characterized by shallow information and weak pertinence, indicating a lack of in-depth and targeted home-preschool communication regarding children's mental health. Only 45% of preschools regularly carry out mental health education guidance for parents, while 55% lack relevant resources or plans. It is necessary to further improve communication quality and innovate collaboration formats to strengthen the synergy of education.

4.3 Analysis of Key Factors Influencing Preschool Children's Physical Health Education

In the dimension of family-level influences on children's physical and mental health education, physical health and mental health exhibit differentiated yet interrelated characteristics. In terms of physical health education, family economic status, parents' attitudes toward physical health, and their own exercise habits are three significant influencing factors: Household annual income shows a consistently significant positive correlation with the level of support for preschool children's physical activities (all $p<0.05$). Among these correlations, the association with "frequently accompanying children to participate in physical activities" is the strongest ($r=0.27$), while the correlation coefficients with "strongly supporting children's physical activities," "continuously paying attention to children's physical conditions," and "regular physical exercise at

fixed times every week" are r=0.15, r=0.10, and r=0.13 in sequence. This suggests that economic conditions serve as an important material guarantee for the implementation of physical activities. Additionally, parents' attention to their children's physical conditions is strongly positively correlated with their supportive behaviors for physical activities (r=0.71, p<0.01), reflecting the close coupling between attention level and educational actions. However, some parents may lack sufficient understanding of preschool children's exercise habits, which could weaken the accuracy of their guidance.

Focusing on mental health education, parents' highest education level, household annual income, and children's gender are significant influencing factors (see Table 1), while the number of children in the family shows no significant correlation. Parents' highest education level is weakly positively correlated with their attention to children's emotional control (r=0.14*, p<0.05), demonstrating the positive enabling effect of higher education on cognition related to emotional education. Household annual income is significantly positively correlated with parents' attention to children's interpersonal communication and social adaptation (r=0.13*, p<0.05), but its correlations with attention to emotional control and self-cognition do not reach statistical significance. This indicates that improved economic conditions enhance parents' focus on children's social development. Children's gender is significantly positively correlated with all dimensions of mental health; since the correlation coefficients fall in the weak to moderate range, gender is a stable yet non-dominant factor influencing parents' attention to mental health, suggesting differences in parents' mental health concerns for children of different genders. Meanwhile, parents' attention to various dimensions of mental health is significantly positively correlated (e.g., the correlation coefficient between emotional control and social adaptation is as high as 0.63**, p<0.01), reflecting the coordination and integrity of their attention.

Table 1 Effects of Parental Highest Education, Household Annual Income, Number of Children, and Child Gender on Parental Attention Levels

Variable	Parental Highest Education	Household Annual Income	Number of Children	Child Gender	Emotional control	Interpersonal communication	Social adaptation
Emotional Control	0.14*	0.06	-0.07	0.17**	1		
Interpersonal Communication	0.09	0.13*	0	0.19**	0.57**	1	
Social Adaptation	0.07	0.13*	-0.05	0.15**	0.63**	0.62**	1
Self-Cognition	0.09	0.12	-0.04	0.18**	0.66**	0.64**	0.63**

Note: *p < 0.05**p < 0.01

As the core developmental setting for children during their preschool years, preschool resource allocation and environmental conditions play a critical supporting role in physical and mental health education.

In terms of physical health education, there are significant differences in resource supply among preschools of different natures: Public preschools, leveraging policy preferences and financial advantages, have a resource supply volume that significantly outperforms other types (e.g., private preschools, public welfare preschools) (see Figure 4). Correlation analysis further confirms that the preschool activity environment is closely associated with children's physical health: satisfaction with the venue environment exhibits a positive correlation with the frequency of preschool children's illnesses (r=0.15, p<0.05), highlighting the positive facilitative role of a favorable physical environment.

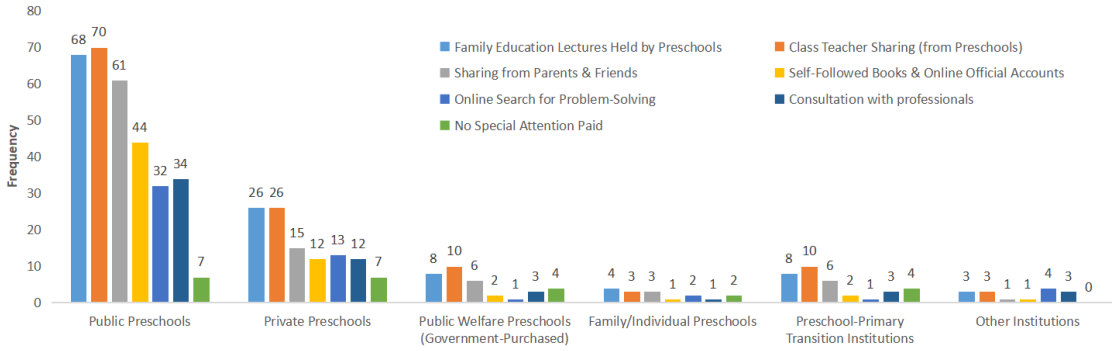


Figure 4. Provision of Physical Health-Related Resources by Different Types of Preschools

Regarding mental health education, preschool resource allocation is highly correlated with regional level and institutional nature. Public preschools have overall sufficient and balanced resources, while public welfare preschools show uneven resource distribution—only about 30% of them possess the capacity for regular mental health assessments, a proportion significantly lower than that of public and private preschools. At the regional level, preschools in municipalities directly under the central government have the highest and most balanced resource levels, while preschools below the municipal level have notable shortcomings (prefecture-level cities lack specialized venues and equipment; county-level cities and below lack specialized teachers and regular mental health testing). Notably, teacher educational attainment is highly linked to preschool nature and region: preschools in municipalities are dominated by teachers with bachelor's or master's degrees; the proportion of teachers with bachelor's degrees in public preschools is significantly higher than in private preschools; and public welfare preschools have no teachers with master's degrees or higher. These dual disparities in resources and faculty directly affect the regional and typological balance of mental health education quality.

As direct practitioners of mental health education, teachers' professional competence and the educational environment jointly determine practical effectiveness. Correlation analysis results indicate that teachers' educational attainment and preschool nature are key factors influencing their mastery of mental health knowledge, while teachers' academic major shows no significant correlation (see Table 2). Teachers' highest educational attainment exhibits a significant positive correlation with their mastery of educational objectives ($r=0.18^{**}$, $p<0.01$) and their ability to interpret children's psychological and behavioral problems ($r=0.24^{**}$, $p<0.01$). Preschool nature shows a significant negative correlation with teachers' mastery of theoretical knowledge ($r=-0.14^{*}$, $p<0.05$) and their understanding of educational objectives ($r=-0.18^{**}$, $p<0.01$). Additionally, teachers' basic theoretical knowledge of mental health exhibits a moderate positive correlation with their ability to interpret children's psychological and behavioral problems ($r=0.53^{**}$, $p<0.01$).

The location of preschools is significantly negatively correlated with teachers' knowledge mastery—specifically, teachers in provincial-level regions and municipalities directly under the central government perform better in theoretical knowledge reserves, understanding of educational objectives, and practical application capabilities. This result indicates that teachers' professional foundation is a critical prerequisite for improving the quality of preschool children's mental problem counseling, while the regional hierarchy and

resource conditions of the affiliated preschool constitute important external support. These two factors form a synergistic effect, jointly influencing the implementation quality of mental health education.

Table 2: Effects of Teachers' Professional Background, Preschool Location, and Preschool Nature on Teachers' Mastery of Relevant Knowledge

Variable	Teachers' Highest Education	Teachers' Academic Major	Basic Theoretical Knowledge	Mastery of Educational Objectives	Preschool Nature	Preschool Location
Mastery of Basic Theoretical Knowledge	0.07	-0.02	1		-0.14*	-0.26**
Mastery of Educational Objectives	0.18**	0.01	0.59**	1	-0.18**	-0.25**
Interpretation of Children' s Psychological & Behavioral Problems	0.24**	-0.08	0.53**	0.69**	-0.18*	-0.24**

Note: *p < 0.05** p< 0.01

5 Conclusions

This study focuses on the home-preschool co-education mechanism, and deeply analyzes the challenges and their underlying causes facing the physical and mental health development of preschool children in the Beijing-Tianjin-Hebei region of China. A core finding reveals the prevalent awareness-practice gap among parents regarding children's physical health. Empirical analysis further confirms that household economic status, parents' core attitudes toward physical health, and their own exercise habits are significant predictive variables influencing children's physical health education. Meanwhile, the study highlights key constraints at the preschool level, such as uneven resource allocation and a mismatch between teachers' professional competence and resource support, which together lead to an effectiveness bottleneck in the implementation of physical and mental health education.

5.1 Research Implications

Theoretically, this study enriches the understanding of the influence mechanisms of family environments—particularly parental cognition and practice—on early childhood development, highlights the pivotal role of home-preschool interaction quality in promoting physical and mental health, and provides new empirical evidence for the development of a more comprehensive theoretical model of home-preschool co-education. Practically, it offers directions for targeted interventions.

At the national level, it is necessary to improve policies, regulations, and resource guarantee systems to promote balanced resource allocation. For policymakers, it is urgent to increase resource inclination toward under-resourced preschools, especially for mental health education support and sports facilities, and establish a standard system covering both urban and rural areas; in-service training for preschool teachers should also be strengthened to enhance their ability to integrate physical and mental health education.

At the preschool level, resource allocation, especially in the field of physical health should be optimized;

emphasis should be placed on enhancing teachers' professional training, particularly in mental health; meanwhile, a multi-level, regular home-preschool communication system should be constructed, e.g., via digital platforms and workshops, and evidence-based mental health support strategies and resources should be proactively provided to parents.

At the teacher level, it is necessary to strengthen professional competence and practical capabilities, foster awareness of lifelong learning, and particularly enhance the ability to sensitively interpret children's psychological and behavioral problems as well as develop effective counseling strategies. Additionally, teachers should promote teamwork and resource sharing, and learn to conduct effective and in-depth communication with parents from diverse backgrounds to establish mutually trusting and cooperative relationships.

At the home-preschool co-education level, an efficient collaborative mechanism should be improved, and clear, operable home-preschool co-education charters or agreements should be established—with a focus on setting up fixed communication channels to enhance the depth and frequency of interactions.

At the parent level, it is critical to enhance personal health literacy, develop positive exercise habits, and boost the sense of efficacy in engaging with home-preschool co-education while avoiding overemphasis on physical health at the cost of mental health or vice versa and valuing proactive mental health interventions. Parents should also increase participation in parent-child physical activities, actively engage in home-preschool co-education initiatives, enhance their capacity to scientifically identify and apply professional educational resources, and recognize the family as one of the primary settings for education.

5.2 Research Limitations and Future Research Recommendations

This study's sample is mainly derived from the Beijing-Tianjin-Hebei region of China, and the socio-economic and cultural characteristics of this area may limit the generalizability of the research findings. A cross-sectional design makes it difficult to capture dynamic changes and long-term effects, while the measurement of certain variables such as parental attitudes may be affected by social desirability bias. These limitations point to directions for future research:

Future studies can expand the research scope by incorporating more diverse geographical regions and larger sample sizes to test the robustness and cultural adaptability of the model. They can conduct in-depth comparisons of the influence mechanisms of home-preschool co-education models on children's physical and mental health across different cultural contexts, identifying universal patterns and culture-specific factors. To track long-term effects, longitudinal research designs should be adopted to evaluate the sustained impacts of early home-preschool co-education interventions on children's physical and mental health through adolescence and even adulthood. Additionally, future research should focus on mechanism exploration, using mixed methods to further investigate how parental cognition translates into specific behaviors and the key factors influencing the transmission of health behaviors in home-preschool interactions, among others.

Although this study is rooted in the Chinese context, the findings regarding the importance of home-preschool synergy, the parental awareness-practice gap, and the need for resource-capability matching offer important insights for countries worldwide facing similar challenges—especially developing regions undergoing rapid urbanization and emphasizing early childhood education. China's practical explorations such as policy initiatives and innovations in home-preschool cooperation models, as well as the challenges encountered, provide valuable "Chinese cases" for the international academic and policy communities, enriching the global knowledge base and practical experiences on optimizing early environments to promote children's holistic development. We call for education policymakers, preschool educational institutions, teacher communities, families, and even communities to urgently join forces in co-constructing a supportive ecosystem characterized by adequate resources, smooth communication, and a focus on children's holistic development, thereby contributing multifaceted solutions to the improvement of preschool education quality worldwide.

Funding

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