ORIGINAL RESEARCH

Empathy and Mental Health of Preschool Teachers: A Latent Profile Analysis

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Purpose: This research, grounded in the self-other oriented empathy theoretical framework, aimed to explore the classification of empathy and its relationship with mental health among preschool teachers.

Methods: A total of 4345 preschool teachers participated in the study. Mental health was assessed using the Symptom Checklist 90 (SCL-90), and empathy was measured with the Chinese version of the Interpersonal Reactivity Index (IRI-C). Data were collected through a comprehensive preschool education service platform. Latent profile analysis (LPA) was employed to identify subgroups of preschool teachers by self- and other empathy pattern types. Descriptive statistics, bivariate cross-tabulations, and multinomial logistic regression were used to characterize each profile while quantifying associations with mental health.

Results: A four-profile model was identified as the best fit in this latent profile analysis: the largest profile of preschool teachers was characterized by moderate self- and other-oriented empathy (46.5%), a second profile was characterized by high self- and other-oriented empathy (25.2%), a third profile was characterized by high other-oriented and low self-oriented empathy (20.8%), and the smallest profile was characterized by both low self- and other-oriented empathy (7.5%). Significant differences in mental health were observed between the latent profile. The high empathy profile exhibited the highest level of mental health risk, while the other-oriented groups showed the lowest level.

Conclusion: There are four latent profiles of empathy in preschool teachers, and the profiles of empathy are related to mental health.

Keywords: preschool teachers, empathy, mental health, latent profile analysis

Introduction
Mental Health in Preschool Teachers

According to the World Health Organization (2006), mental health is defined as a state of well-being, and the symptoms of mental health are regarded as indicators of compromised mental well-being. In Beijing, frequent educational reforms and intense competition in the education sector have contributed to the emergence of mental health issues among preschool teachers.[1] Teachers' mental health is critical for the students.[2–5] A substantial body of research indicates that teachers' better mental health is associated with improved students' mental health,[2] emotional states,[6] and learning outcomes.[2] Conversely, teachers' depression and anxiety are linked to poorer teaching quality and relationships with students.[7] Moreover, the mental health status of teachers also correlated with their own professional development and well-being, with research indicated that teachers' mental health correlated with their professional success,[8] while mental health symptoms were found related to a higher risk of teacher burn out and attrition.[9,10]

However, the mental health status of teachers is not encouraging. As one of the "high-risk professions", teachers have long been considered to be subject to a high level of stress on the job.[11] Although no previous studies have found a higher rate of psychiatric disorders (as defined in manuals such as the Diagnostic and Statistical Manual of Mental Disorders (DSM), American Psychiatric Association, 1994) among teachers compared to other occupational groups,[12,13] numerous studies have suggested that teachers experience significantly poorer mental health conditions, for instance, teachers reported higher levels of mental fatigue and psychological distress.[14,15] Furthermore, Yang et al conducted a meta-

analysis of studies examining teachers' mental health using the Symptom Checklist 90-Revised (SCL-90-R) from 1998 to 2013.[16] Their findings revealed a worrying trend of deteriorating psychological well-being among teachers during this period. The results of research on the mental health of preschool teachers are also inconsistent. One meta-analysis suggested that in China, preschool teachers' mental health conditions are at least as good as, if not better than, those of teachers from other educational stages (eg, primary and secondary school).[17] However Chen's research presented contrasting results, that compared with K-12 teachers, preschool teachers actually scored higher than Chinese national controls on the mental health symptoms measured by SCL-90.[18] Given these conflicting findings and considering the great importance of mental health for preschool teachers, it is crucial to further explore the factors that affect their psychological well-being.

Teachers' Empathy and Its Relationship With Mental Health

Empathy, the capacity to feel and understand the emotions of others, is widely accepted as a multifaceted construct.[19,20] Research categorizes empathy into self-oriented and other-oriented dimensions based on its social function.[21,22] Self-oriented empathy involves vicarious negative emotions, such as emotion contagion and personal distress, triggered by others' sad or stressful situations. This category also includes empathic fantasy,[23] defined as the tendency to vicariously feel a virtual character's feeling in a fiction.[24] Individuals experiencing self-oriented empathy often lack genuine altruism and engage in prosocial behavior only when they cannot escape from the situation. Conversely, other-oriented empathy, rooted in effective emotion regulation, entails genuine concern and understanding of others' emotions. Individuals exhibiting other-oriented empathy demonstrate higher levels of prosocial behavior.[25] This distinction is crucial in understanding the different impacts of empathy on behavior and mental health.

A widely accepted and comprehensive framework for empathy was proposed by Davis, which outlines four dimensions: personal distress, fantasy, empathic concern, and perspective taking.[24] Based on this framework, Davis developed the Interpersonal Reaction Index,[26] a widely used tool to assess the multifaceted nature of empathy. According to the self/other oriented empathy theoretical frame, personal distress and fantasy reflect the self-oriented empathy, while empathic concern and perspective taking reflect the other-oriented empathy.[23]

As a psychological mechanism that helps individuals balance the relationship between self and others,[27] empathy is presumed to play a crucial role in people's mental health. It is through the independent and interactive effects of self-oriented empathy and other-oriented empathy that individuals adapt to the complexities of social life. Empirical research has provided evidence supporting the relationship between empathy and mental health.[28,29] Empathy may play an even more important role in the preschoolers' mental health.

The further research revealed that the self- and other oriented empathy associated differently with the various indicators of people's social adaption. For example, it is found that in caregivers for dementia patients, the self-oriented empathy component is negatively correlated with their level of mental health, but no relationship was found between other-oriented empathy and mental health.[30]

The work of preschool teachers is regarded as a form of emotional labor by nature.[31] Surrounded by children's various emotions, preschool teachers must feel, understand, and react to others' emotions appropriately.[32,33] Consequently, preschool teachers are more susceptible to the effects of stress and may have a higher likelihood of experiencing burnout, anxiety, and other psychological issues.[34,35] Using the Interpersonal Reactivity Index (IRI), Research has found that among preschool teachers, the other-oriented components of empathy (empathic concern and perspective taking) were positively correlated with mental health, while the self-oriented components (personal distress and fantasy) were negatively correlated with mental health.[23]

However, these studies typically employ a variable-centered approach that assesses individual empathy dimensions among educators. While valuable, such insights might sometimes be too coarse-grained depending on the research questions, as different subgroups with distinct patterns of empathy responding exist within a sample.[36] To identify these subgroups, person-centered analyses, such as latent profile analyses (LPA), are necessary. These fine-grained, case-based approaches identify individuals with similar patterns of scientific reasoning skills and aim to reduce data "noise" by dividing total variability into "between-group" and "within-group" variability.[37,38]

This study aims: (1) investigate the self/other-oriented empathy heterogeneity within preschool teachers, (2) examine how empathy subgroups differ in terms of demographic variables, and (3) explore whether preschool teachers from different empathy subgroups differ in mental health symptoms.

Methods

Participants and Procedure

We collected data from 4345 preschool teachers across 544 public kindergartens in 19 administrative districts of Beijing. All of the kindergartens were public institutions, and the teachers were all current preschool educators. At the time of data collection, there were a total of 913 public kindergartens and approximately 21,000 preschool teachers in Beijing. The data collection process involved distributing questionnaires through the Early Childhood Education Service Platform.

To maximize accessibility and convenience, participants were given the flexibility to complete the questionnaires using either their mobile phones or computers. This study was reviewed and approved by the Ethics Committee of Capital Normal University. Informed consent was obtained from all participants before they commenced the survey.

Measures

Socio-Demographic Questionnaire

We used a demographic survey questionnaire, which included variables such as gender, age, marital status, fertility, education, major, household registration, teaching experience, title, position, work profile, nature of the kindergarten, and kindergarten level.

Mental Health Symptom

The Chinese version (Wang Zhengyu) of the Symptom Checklist-90 (SCL-90-C; L.R. Derogatis) was used to measure the participants' mental health.[39,40] The SCL-90 assesses nine dimensions of mental health: somatization (eg, dizziness or fainting), obsessive-compulsive symptoms (eg, repeated checking), interpersonal sensitivity (eg, feeling misunderstood or unappreciated), depression (eg, suicidal thoughts), anxiety (eg, restlessness or agitation), hostility (eg, urges to hit or hurt others), phobic anxiety (eg, fear of going out alone), paranoia (eg, mistrust of others), and psychoticism (eg, feeling something is wrong with one's mind). These dimensions encompass a total of 90 items. Participants rated the extent to which they were troubled by each item in the past week on a 5-point Likert scale, ranging from 1 ("no symptoms") to 5 ("severe"). Higher total scores on the questionnaire indicate more severe mental health symptoms and poorer mental health status. In this study, the Cronbach's α coefficients for the nine dimensions of the scale ranged from 0.88 to 0.94, and the coefficient for the total scale was 0.99. The score of 0–2 indicates low mental health symptoms, 2–3 indicates moderate mental health symptoms, and 3–5 indicates high mental health symptoms.

Empathy

In this study, the Chinese version of the Interpersonal Reactivity Index (IRI) was employed to measure participants' empathy.[26,41] The IRI comprises four sub-scales: empathic concern (eg, "When I see someone being taken advantage of, I feel kind of protective towards them"), perspective taking (eg, "Before criticizing somebody, I try to imagine how I would feel if I were in their place"), fantasy (eg, "When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me"), and personal distress (eg, "In emergency situations, I usually remain calm".). The scale contains a total of 28 items. According to the previous research, empathic concern and perspective taking reflect other-oriented empathy, whereas personal distress and fantasy represent self-oriented empathy. The questionnaire utilized a 5-point Likert rating scale, ranging from 1 (strongly disagree) to 5 (strongly agree). In this study, the Cronbach's α coefficients for the our subscales of the scale ranged from 0.70 to 0.78, and total scale was 0.89.

Data Analysis

The data were analyzed using SPSS 27.0 and Mplus 8.7 Except the descriptive and correlative statistics (see Table 1), three analyses were conducted. First, a latent profile analysis(Collins LM, Lanza ST) was used to characterize the latent

Table 1 Descriptive Statistics and Correlation Analysis of Variables (N = 4345)

	M ± SD	1	2	3	4	5
1.Fantasy	3.02 ± 0.59	1				
2.Personal Distress	2.83 ± 0.55	0.52*	1			
3.Empathic concerns	3.66 ± 0.52	0.43*	0.26**	1		
4.Perspective Taking	3.55 ± 0.59	0.20*	−0.06**	0.60**	1	
5.Mental Health	1.77 ± 0.65	0.36*	0.57**	0.05**	−0.17**	1

Notes: **p < 0.01, and *p < 0.05.

structure of empathy patterns in the participants. Second, using the Chi-square test, examine the distribution characteristics of demographic variables under each empathy profile. At last, using used demographic variables that were significant in the difference tests, including gender, fertility, major, teaching experience, position, and kindergarten level, along with empathy profile as the independent variables and mental health symptoms as the dependent variable in a multinomial logistic regression analysis, to explore preschool teachers' mental health symptoms under different empathy profiles and demographic information.

Results
Descriptive Statistics and Correlation Analysis
Descriptive statistics and correlation analysis for the scores of empathy and mental health symptoms are presented in Table 1.

Identity Profiles of Empathy in Preschool Teachers
To explore the latent patterns of empathy among preschool teachers, a Latent Profile Analysis (LPA) was conducted based on the four dimensions of empathy: fantasy, personal distress, empathic concern, and perspective-taking. Latent Profile Analysis (LPA) with robust maximum likelihood estimation was performed using Mplus version 8.7 The analysis began with a one-profile solution and progressively evaluated models with an increasing number of profiles, up to a five-profile solution. This LPA began with a solution containing 1 profile and included evaluating models with an increasing number of profiles up to a 5-profile solution. The number of profiles retained in the final model was based on the overall interpretability of the solution in addition to the Akaike information criterion (AIC), Bayesian information criterion (BIC), sample size-adjusted BIC (aBIC), entropy, and the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT). Smaller values for BIC, SSABIC, and AIC are indicators of better model fit while higher values are preferred for model entropy.[42] Fit statistics are obtained for each model, and are compared to those of other models to determine the best fitting model (See Table 2). Figure 1 presents a plot of the profile-specific probabilities of self/other-oriented empathy patterns for the 4-profile solution.

Table 2 Latent Profile Fit Results for Preschool Teachers' Empathy (N = 4345)

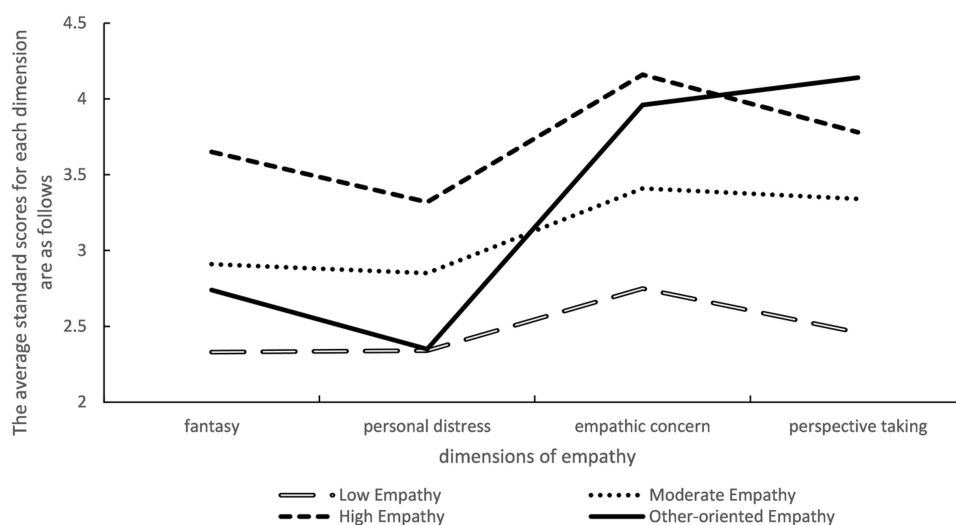| M	AIC	BIC	aBIC	LMR	BLRT	Entropy	profile Size: n
C1	29237.254	29,288.269	29,262.848				4345
C2	27272.971	27,355.869	27,314.561	0.000	0.000	0.642	1638/2707
C3	26258.056	26,372.838	26,315.642	0.342	0.000	0.624	1229/1942/1174
C4	25299.825	25,446.491	25,373.406	0.000	0.000	0.719	327/2023/903/1092
C5	24941.918	25,120.467	25,031.495	0.015	0.000	0.717	329/1956/594/987/479

Figure 1 Mean scores of empathy dimensions for each latent profile of preschool teachers.

Once the best-fitting model was identified, the model classifications for the best-fitting model were assessed to ensure profiles are well-separated and the latent profile analysis is accurate. As shown in Table 2, as the number of profiles increases, the AIC, BIC, and aBIC values consistently decrease, indicating that the model fit gradually improves. For the C2, C4, and C5 models, the LMR and BLRT values reach significance levels, indicating statistical significance ($p < 0.05$). Notably, the entropy value for the C4 model is 0.72, suggesting a higher level of correct classification compared to the C2 and C5 models. Overall, the model with C4 is considered the optimal model.

Interpretation of the 4-profile Empathy Solution

A plot of the profile specific probabilities of empathy for the 4-profile solution is presented in Figure 1, and the means and standard deviations for each of the four profiles are presented in Table 3. Moreover, to explore the characters in each profile, four one-way analyses of variance (ANOVA) were performed with the four empathy dimensions as dependent variables and the four latent profiles as independent variables. The results suggested that, the largest profile of preschool teachers contained 2020 preschool teachers (46.5%). Characterized by moderate self- and other-oriented empathy, this profile of preschool teachers was named *Moderate Empathy*. The next-largest contained 1092 preschool teachers (25.2%) who scored at a high level in both self- and other-oriented empathy, and consequently named *High Empathy*. The third profile contained 901 preschool teachers (20.8%). Characterized by high other-oriented and low self-oriented empathy,

Table 3 Descriptive Statistics, Analysis of Variance, and Post-Hoc Tests for Scores on Four Dimensions of Empathy Among Four Latent Profiles of Preschool Teachers [M ± SD]

profiles	Fantasy	Personal Distress	Empathic Concern	Perspective Taking
profile 1: Moderate Empathy	2.91 ± 0.41	2.85 ± 0.41	3.41 ± 0.30	3.34 ± 0.35
profile 2: High Empathy	3.65 ± 0.47	3.32 ± 0.46	4.16 ± 0.33	3.78 ± 0.49
profile 3: Other-oriented Empathy	2.74 ± 0.46	2.35 ± 0.43	3.96 ± 0.30	4.14 ± 0.38
profile 4: Low Empathy	2.33 ± 0.33	2.34 ± 0.33	2.75 ± 0.21	2.46 ± 0.37
F	1214.98	1025.13	2709.64	1801.05
Bonferroni	2>1>3>4	2>1>3=4	2>3>1>4	3>2>1>4

Notes: 1. "M"ranging from 1 (strongly disagree) to 5 (strongly agree); 2. "4" = Low Empathy, "3" = Other-oriented Empathy, "2" = High Empathy, "1" = Moderate Empathy.

this profile was named *other-oriented Empathy*. The smallest profile contained 329 preschool teachers(7.5%), and this profile was characterized by both low self- and other-oriented empathy, and was named *Low Empathy*.

The Demographic Features of the Four Empathy profiles

To further characterize the latent profiles, separate bivariate (ie, Chi-square) analyses of demographic features and empathy-related characteristics were performed. We examined both personal features of the preschool teachers (eg, gender, age, marital status, with or without children, education level, major, household registration) and job status (such as teaching experience, title, position, work profile, kindergarten nature, and kindergarten level) across the four empathy profiles in preschool teachers. The findings are detailed in Table 4:

In the middle empathy group, the proportion of male preschool teachers exceeds that of female teachers; the proportion of teachers without children is greater than those with children; and the proportion of teachers with education majors is higher than those with early childhood education or non-education majors. Additionally, the proportion of teachers and deputy principals is higher than that of principals. No significant differences were observed in terms of age, marital status, education level, teaching experience, household registration, job title, job profile, kindergarten nature, or kindergarten level.

Table 4 Distribution Differences of Demographic Characteristics Among Profiles of Preschool Teachers' Empathy

		Low Empathy	Moderate Empathy	High Empathy	Other-oriented Empathy	X2
		(*n* = 327)	(*n* = 2023)	(*n* = 1092)	(*n* = 903)	
Gender	Female(%)	7.1	46.5	25.6	20.8	34.07**
	Man(%)	18.4	48.7	13.2	19.7	
Age(years)	53–71(%)	9.5	50.8	22.2	17.5	19.00
	42–52(%)	5.9	51.5	121.4	21.2	
	32–42(%)	8.6	48.6	24.6	18.2	
	22–32(%)	7.6	44.6	26.0	21.8	
	18–22(%)	6.4	46.6	26.7	20.43	
Marriage	Married(%)	7.3	45.3	25.2	22.2	13.85
	Non-married(%)	7.7	47.4	25.2	19.7	
	Divorce(%)	5.1	47.5	28.8	18.6	
	Other(%)	15.4	38.5	0	46.2	
Fertility	Have children(%)	7.5	44.7	25.9	21.8	8.10*
	No children	7.5	48.8	24.2	19.5	
Education	Specialized school(%)	9.5	46.5	24.0	20.0	12.67
	Specialty(%)	6.8	45.9	24.4	22.9	
	B.A.(%)	7.7	46.9	25.8	19.5	
	Master(%)	14.3	53.6	21.4	10.7	
Major	Preschool education(%)	7.5	46.2	26.6	19.7	25.99**
	Education(%)	6.7	49.0	23.7	20.6	

(*Continued*)

Table 4 (Continued).

		Low Empathy	Moderate Empathy	High Empathy	Other-oriented Empathy	X2
		(*n* = 327)	(*n* = 2023)	(*n* = 1092)	(*n* = 903)	
	Non-education(%)	8.6	46.0	18.9	26.4	
Household registration	Beijing(%)	7.6	41.5	31.3	19.6	6.24
	Non-Beijing(%)	7.5	46.9	24.7	20.9	
Teaching Experience(years)	0~3(%)	7.3	44.8	23.4	26.6	45.09**
	3–5(%)	6.2	49.6	26.7	17.5	
	5–10(%)	7.9	43.6	28.1	20.3	
	10–20(%)	9.2	46.4	27.3	17.1	
	20–50(%)	7.2	53.9	21.1	17.9	
Title	Three class(%)	7.5	43.8	23.1	25.5	30.84
	Two class(%)	8.5	49.5	25.2	16.8	
	The first class(%)	6.8	48.5	25.8	18.9	
	High(%)	7.4	45.1	27.2	20.3	
	Very high(%)	8.4	45.8	25.3	20.5	
Position	Principal(%)	9.7	32.3	25.8	32.3	11.38*
	Deputy Head of Childcare (%)	4.0	46.0	23.0	27.0	
	Teacher(%)	7.7	46.7	25.2	20.4	
Profile of Work	Lead Teacher(%)	7.6	47.3	26.3	18.7	15.21
	Assistant Teacher(%)	7.1	45.0	26.0	22.0	
	Nursery Worker(%)	7.5	47.4	21.7	23.4	
	Other(%)	8.3	46.9	22.3	22.5	
Nature of Kindergarten	Managed by Education Commission(%)	7.2	46.4	25.4	20.9	7.44
	Managed by kindergarten(%)	9.1	48.3	23.7	18.9	
	Private(%)	9.6	44.2	21.2	25.0	
	Other Organization(%)	11.3	45.2	25.8	17.7	
Kindergarten Level	Demonstration Kindergarten(%)	6.9	48.6	27.7	16.8	59.50**
	First-tier Kindergarten(%)	7.9	46.2	24.9	20.9	
	Second-tier Kindergarten (%)	6.2	45.2	21.1	27.5	
	Third-tier Kindergarten(%)	15.4	42.3	24.4	17.9	

Notes: **$p < 0.01$, and *$p < 0.05$.

In the high empathy group, the proportion of female preschool teachers exceeds that of male teachers; the proportion of teachers with children is greater than those without; and the proportion of teachers with early childhood education majors is higher than those with education or non-education majors. Additionally, the proportion of teachers with 5–10 and 10–20 years of teaching experience is higher than those with other experience levels. The proportion of head teachers and assistant teachers is also higher than that of caregivers and other teachers. Moreover, the proportion of teachers from model kindergartens is higher than those from other kindergartens. No significant differences were observed in terms of age, marital status, education level, household registration, job title, job position, job profile, or kindergarten nature.

In the other-oriented empathy group, the proportion of preschool teachers with children exceeds that of those without; the proportion of teachers with non-education majors is higher than those with early childhood education or education majors; and the proportion of teachers with 0–3 years of teaching experience is greater than those with other experience levels. Additionally, the proportion of head teachers is higher than that of caregivers and teachers. No significant differences were observed in terms of gender, age, marital status, education level, household registration job title, job profile, kindergarten nature, or kindergarten level.

In the low empathy group, the proportion of male preschool teachers is higher than that of females; the proportion of teachers with non-education majors is higher than those with early childhood education or education majors; the proportion of teachers with 10 to 20 years of teaching experience is higher than for those with other experience levels; and the proportion of principals is higher than that of deputy principals and teachers. Additionally, the proportion of teachers in third-tier kindergartens is higher than that in demonstration, first-tier, and second-tier kindergartens. No significant differences were observed in terms of age, marital status, with or without children, education level, household registration, job title, job profile or kindergarten nature.

Mental Health of the Four Empathy Profiles

The mental health symptoms of 4543 preschool teachers were used as the dependent variable, with mental health symptom scores classified into three groups: 0–2 for low symptoms, 2–3 for moderate symptoms, and 3–5 for high symptoms.[43] Demographic variables, including gender, whether the participant had children, major, teaching experience, position, and kindergarten classification, were controlled for. Empathy type was set as the independent variable. The low symptom group was designated as the reference category for comparison. The model fit test indicated that the logistic model was statistically significant ($\chi^2 = 655.748$, $p < 0.001$). Subsequent analysis revealed that empathy type exerted statistically significant effects on mental health symptom scores. The results of multinomial logistic regression, as indicated by p-values and odds ratios (OR), showed that, compared to the other-oriented empathy group, the low empathy group exhibited marginally higher mental health symptom scores, the moderate empathy group displayed higher scores, and the high empathy group had the highest scores (See Table 5).

Table 5 Multinomial Logistic Regression of Mental Health Among Different Preschool Teachers With Empathy Types

		Moderate Symptom		High Symptom	
		OR	95% CI	OR	95% CI
Gender	Man(reference group)				
	Female	1.16***	0.71–1.90	0.44*	0.23–0.84
Fertility	Have children(reference group)				
	No children	0.80*	0.65–0.99	0.90	0.62–1.29

(Continued)

Table 5 (Continued).

		Moderate Symptom		High Symptom	
		OR	95% CI	OR	95% CI
Major	Non-education				
	Preschool education	0.91	0.73–1.18	0.74	0.46–1.18
	Education	1.16	0.85–1.57	1.29	0.77–2.18
Teaching Experience(years)	20–50(reference group)				
	0–3	0.39***	0.28–5.30	0.36***	0.21–0.62
	3–5	0.65**	0.47–0.89	0.40**	0.22–0.74
	5–10	0.78	0.59–1.03	0.79	0.49–1.29
	10–20	0.89	0.68–1.17	1.23	0.78–1.93
Position	Teacher(reference group)				
	Principal	0.43	0.14–1.31	0.33	0.41–2.66
	Deputy Head of Childcare	0.85	0.59–1.23	0.74	0.38–1.43
Kindergarten Level	Third-tier Kindergarten(reference group)				
	Demonstration Kindergarten	1.55	0.93–2.57	1.12	0.49–2.58
	First-tier Kindergarten	1.25	0.76–2.07	1.25	0.55–2.53
	Second-tier Kindergarten	1.37	0.68–1.91	0.64	0.27–1.53
profiles	Other-oriented Empathy(reference group)				
	Low Empathy	1.79**	1.15–2.78	4.34**	1.55–12.12
	Moderate Empathy	5.32***	4.00–7.08	12.80***	5.61–29.24
	High Empathy	9.05***	6.71–12.20	24.15***	10.48–55.65

Notes: ***$p < 0.001$, **$p < 0.01$ and *$p < 0.05$.

Discussion

This study used latent profile analysis to identify four distinct empathy profiles among preschool teachers: moderate empathy, high empathy, other-oriented empathy, and low empathy. Significant differences were observed among these four empathy profiles across various demographic variables, including gender, marital status, parental status, educational background, teaching experience, professional position, and school level. Furthermore, the teachers in these four profiles exhibited varying levels of mental health symptoms. Notably, teachers in the other-oriented empathy profile demonstrated the lowest prevalence of psychological symptoms, while those in the high empathy profile reported the highest levels of mental health concerns. These findings provide valuable insights into the complex relationship between empathy profiles and psychological well-being among preschool teachers.

Different Profiles of Empathy Among Preschool Teachers

This study demonstrates the value of person-centered data analysis in identifying distinct groups of preschool teachers based on self- and other-oriented empathy. While previous research has emphasized the importance of empathy in preschool teachers' work and life,[43] the categorization of teachers based on empathy traits has remained unclear. For the first time, this study identifies four distinct subgroups of preschool teachers based on empathy dimensions: the moderate Empathy group (moderate scores in both self- and other-oriented empathy, 46.5%), the High Empathy group (high scores

in both self- and other-oriented empathy, 25.2%), the Other-Oriented Empathy group (high other-oriented empathy but low self-oriented empathy, 20.8%), and the Low Empathy group (low scores in both dimensions, 7.5%). These findings provide a nuanced understanding of empathy in this professional group, contributing to a more comprehensive framework for assessing and developing empathy among preschool teachers.

This study further investigated the relationship between demographic variables and the four empathy profiles among preschool teachers. The findings revealed significant differences in gender, with or without children, educational background, teaching experience, professional position, and institutional level.

First, significant gender differences were observed across the four empathy profiles of preschool teachers. Although the sample contains fewer males, it reflects the gender ratio typical of the preschool teaching profession. Male teachers were more likely to fall into the low empathy profile, while female teachers were predominantly in the high empathy profile. This aligns with research highlighting the "empathy advantage" in females. One possible explanation is that early childhood education has traditionally been seen as a "female vocation", garnering more social support and recognition for women.[44,45] In contrast, male educators face social biases and gender role pressures that may hinder their emotional empathy, as their behavior is often constrained by masculine stereotypes. Additionally, men in the field often experience lower professional recognition and a disconnect between role expectations and reality, which can impede emotional communication and empathy expression.

Second, the result indicated significant differences in the childbearing status of teachers across the four empathy types. Preschool teachers who were parents tend to be more frequently classified in the high empathy and other-oriented empathy profiles. This result supported the "self-other overlap" hypothesis of empathy. According to Batson's research, when the self and others are more closely intertwined, empathy toward others is strengthened.[45] Similarly, shared experiences can lead to a deeper fusion of self and others.[46] For instance, studies found that mothers may have an exhibit heightened emotional response to their babies' crying.[47] The experience of parenting may, therefore, amplify empathetic responses not only toward children but also toward parents in a professional context. Therefore, preschool teachers who are parents are likely to be more attuned to young children's emotional responses, demonstrating higher empathy.

Third, the results also indicated significant differences in the educational background of teachers across the four empathy types. Graduates from educational programs showed a higher proportion of high empathy profiles, while those from non-educational programs had more representation in the low empathy profile. This finding underscores the importance of specialized training in child psychology and education in developing empathetic traits among teachers.

Although there are no age differences, there are significant differences in teaching experience among the four different types of teachers based on empathy. Teachers with 0–3 years of experience showed a higher proportion of other-oriented profiles, while those with 10–20 years of experience had a higher representation in the low empathy profile. This pattern may reflect the different stages of professional development in teaching career.[48–51] According to the teacher's career development curve, the professional life of teachers includes three stages: novice teacher, experienced teacher, and expert teacher. Teachers at each stage exhibit different emotional response characteristics.[52,53] Novice teachers with 0–3 years of experience are still in the survival stage,[54] and they often exhibit higher sensitivity and orientation to the needs of children, and are more willing to invest time and effort in understanding and responding to the emotional states of children. Teachers with 10–20 years of experience are in the experienced stage, during which they often focus on the content and tools of teaching, with relatively less attention to the psychological states of their students.[55] At the same time, some teachers may experience a "plateau period" due to career stagnation, leading to professional burnout, characterized by the objectification of their work subjects.[56] The results of this study suggest that education practitioners should pay attention to the professional abilities and emotional states of preschool teachers at this stage. It is important to provide them with targeted training and also focus on teachers' emotional management abilities to cope with professional fatigue and work pressure.

The four empathy profiles among preschool teachers exhibited significant differences in their professional positions: kindergarten principals and educational directors were significantly more likely to exhibit other-oriented empathy profiles. Two potential explanations for this result can be proposed. First, the leadership positions may foster enhanced empathy, as principals frequently need to consider the needs of others, thereby cultivating their empathetic abilities.[57] Second, individuals with superior self-regulation abilities may not only achieve better career progression but also

demonstrate more advanced empathy profiles. This aligns with previous research that has established a positive association between sophisticated empathy patterns and robust self-regulation capabilities.[58]

In addition to the professional position of early preschool teachers, there are also significant differences based on the institutional level. Preschool teachers with the four empathy profiles exhibited significant differences in their situational level: Teachers in demonstration kindergartens showed a higher proportion of high empathy profiles, while those in level-three kindergartens had a higher representation in the low empathy profiles. This difference may be related to variations in resources, management quality, and working environments across different institutional levels.[59,60]

The Relationship Between Empathy and Mental Health

While previous research has highlighted the positive impact of other-oriented empathy and the negative impact of self-oriented empathy on teachers' mental health, this study is the first to explore mental health differences among preschool teachers with varying empathy profiles. The findings reveal distinct patterns: teachers with an other-oriented empathy profile have the highest mental health, followed by those with low and moderate empathy, while teachers with a high empathy profile show the lowest mental health. To further clarify these differences, we will examine the adaptive functions of self-oriented and other-oriented empathy across these profiles.

Preschool teachers with an other-oriented empathy profile demonstrate the best mental health. This profile is characterized by higher empathy directed towards others and lower self-oriented empathy. Self-oriented empathy components can induce surrogate emotions and anxiety in response to others' emotions, leading to negative reactions and poor mental health outcomes.[61,62] Conversely, other-oriented empathy, based on self-other differentiation and self-regulation, positively predicts various adaptive mental health indicators.[63,64] Teachers with this profile are less affected by negative emotions and can respond empathetically to others. Wang et al suggest that effectively utilizing different components of empathy can help educators better adapt to their work environment.[65]

Teachers with low empathy and those with moderate empathy exhibit moderate levels of mental health. Interestingly, those with low empathy tend to manifest slightly fewer mental health symptoms compared to their moderate empathy counterparts. This could be due to the emotional detachment characteristic of the low empathy profile. When faced with negative emotional cues from others, teachers with low empathy maintain emotional independence, reducing the tendency to become overly involved in others' emotional states. This detachment leads to lower stress levels and fewer mental health symptoms.[66]

Teachers exhibiting high empathy profiles paradoxically demonstrate the highest levels of mental health symptoms and the lowest levels of overall mental health. These teachers exhibit high levels of both self-directed and other-directed empathy. This can be explained in two ways. First, teachers in this group are more prone to absorbing others' negative emotions, which can deplete their psychological resources and increase the risk of mental health issues.[67] Additionally, these teachers may struggle with emotion regulation, as the early education profession requires deep attention to children's psychological states. Without effective emotional boundary-setting, they are more vulnerable to work-related emotional stress.

This study identifies four distinct empathy profiles among preschool teachers, each with unique traits, and highlights how these profiles relate to varying levels of psychological well-being. The findings support existing research on the negative relationship between self-oriented empathy and mental health, while also showing that the impact of other-oriented empathy on mental health is influenced by the level of self-oriented empathy. Specifically, teachers with high levels of both self- and other-oriented empathy tend to have the poorest mental health, while those with a predominantly other-oriented empathy profile report the best mental health. These results deepen our understanding of the adaptive functions of different empathy components.

Limitations and Future Research

This study has several limitations that warrant consideration. Firstly, in this research, empathy and mental health were primarily assessed using self-report measures, which are susceptible to response biases, including social desirability effects. These biases may have influenced the results.[68] Furthermore, the cross-sectional nature of this study limits causal inferences regarding the relationship between empathy profiles and mental health outcomes. At last, the generalizability

of the identified four empathy profiles and their relationship with mental health remains uncertain. It is unclear whether these patterns are unique to preschool teachers or applicable to broader populations.

Future studies could benefit from incorporating multinomial assessment methods, such as observer ratings or behavioral measures, to provide a more comprehensive and objective evaluation of empathy and mental health. Longitudinal research designs would also be valuable in elucidating the causal relationships between empathy and mental health among preschool teachers. Moreover, multi-sample approaches (eg comparisons across different occupational groups) are needed to enhance the robustness and external validity of the findings.

Conclusion

This study employed latent profile analysis to identify four distinct empathy patterns among 4345 preschool teachers in Beijing: moderate empathy, high empathy, other-oriented empathy, and low empathy. These empathy patterns showed significant differences across demographic variables such as gender, marital status, parental status, educational background, teaching experience, professional position, and school level. Moreover, teachers with different empathy patterns exhibited varying degrees of mental health symptoms, with the other-oriented empathy pattern associated with the lowest incidence of psychological symptoms, while the high empathy pattern reported the highest levels of mental health symptoms.

Theoretical and Practical Implications

This study offers some valuable insights and potential implications for our understanding of empathy and mental health among preschool teachers. While further research is needed to confirm and expand on these findings, the results suggest several interesting theoretical considerations and possible practical applications that could be worth exploring in the field of early childhood education.

From a theoretical perspective, this research extends empathy theory in the educational field, particularly in early childhood education.[69] By identifying different empathy patterns, it provides new perspectives on understanding the multidimensional nature of teacher empathy.[26] The results challenge the traditional view that higher empathy is always associated with better mental health.[70] The finding that teachers with high empathy patterns reported the highest levels of mental health problems emphasizes the potential negative impact of excessive empathy.[28,71] Moreover, the discovery that the other-oriented empathy pattern is associated with optimal mental health provides new insights into the theoretical model of the relationship between empathy and mental health, highlighting the importance of balancing self- and other-oriented empathy.[72]

This study also has practical implications. First, teacher training programs should consider incorporating empathy skill development, but emphasize balance and moderation to avoid the potential negative impacts of excessive empathy.[67] Second, school administrators and policymakers should recognize the diverse needs of teachers with different empathy patterns and provide targeted support and mental health interventions.[69] Empathy patterns could be considered as a factor in preschool teacher recruitment and evaluation processes to ensure diversity and balance in teaching teams.[26] It is also important to develop targeted mental health interventions, particularly offering emotional regulation and self-care skill training for teachers with high empathy patterns to reduce their mental health risks.[71,73] Finally, the establishment of peer support systems should be encouraged, allowing teachers with different empathy patterns to learn from and support each other, promoting overall teacher mental health and professional development.

Compliance With Ethical Standards

This study was reviewed and approved by the Ethics Committee of Capital Normal University. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study prior to their participation.

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Disclosure

The authors report no conflicts of interest in this work.

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