



The relationship between preschool teacher trait mindfulness and teacher-child relationship quality: the chain mediating role of emotional intelligence and empathy

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Accepted: 7 March 2023

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Abstract

The teacher-child relationship plays an important role in children's future development. However, the existing research mainly focuses on the influence of preschool teachers' external conditions on the teacher-student relationship, while the research on the influence of teachers' internal psychological characteristics on the teacher-student relationship is relatively lacking. In this study, three hundred and seventeen preschool teachers were tested with Five Facet Mindfulness Questionnaire, Emotional Intelligence Scale, Chinese Interpersonal Response Index, and Teacher-student Relationship Scale. The results showed that trait mindfulness positively predicted the quality of parent-teacher relationship ($\beta = 0.173, p = 0.026$). Emotional intelligence played a mediating role in trait mindfulness and teacher-child relationship quality ($\beta = 0.118, p = 0.004$), and empathy played a mediating role in trait mindfulness and teacher-child relationship quality ($\beta = 0.112, p = 0.001$). Meanwhile, emotional intelligence and empathy played a chain mediating role in trait mindfulness and parent-teacher relationship quality ($\beta = 0.044, p = 0.038$). On the one hand, this study enriches attachment theory. The conclusions of this study verify the diversity of proximal factors in attachment theory, and confirm the influence of teachers' own characteristics and abilities on the teacher-child relationship quality. On the other hand, by exploring the factors affecting the teacher-child relationship quality, we can find ways to improve teacher-child relationship from a new perspective, and then provide some new methods and approaches for improving the quality of preschool teacher-child relationship.

Keywords Trait mindfulness · Emotional intelligence · Empathy · Teacher-child relationship quality · Preschool teacher

Introduction

High-quality preschool education is of great significance to children's development. The quality of teacher-child relationship (QTCR) is generally recognized by the international community as a key factor in evaluating high-quality preschool education (Veraksa et al., 2020; Alexandersen et al., 2021;

Blewitt et al., 2020). Therefore, over the years, the QTCR has become a focus area and frontier topic of common concern among academic researchers and educators (Vatou et al., 2020; Aboagye et al., 2019; Hu et al., 2021; Loomis, 2021). The teacher-child relationship is defined as an interpersonal relationship formed during the interaction between preschool teachers and young children (Ainsworth, 1991). The teacher-child relationship is considered as a "secondary attachment bond", which is another important relationship besides the parent-child relationship and the most important interpersonal relationship in kindergarten. In fact, a large number of existing studies also show that the QTCR is a core element affecting children's development (Ettekal & Shi, 2020; McKinnon & Blair, 2019; Acar et al., 2021; Metin Aslan & Boz, 2022). A positive teacher-student relationship can increase students' enthusiasm for learning and social adaptation, thereby improving the satisfaction of psychological needs and enhancing peer relationships, and may reduce students' academic pressure and learning burnout (Clem et al., 2021). The quality

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of the teacher-child relationship also predicts children's psychosocial functioning, academic performance, and school motivation and engagement (Rucinski et al., 2018; Herman & Reinke, 2017). It can be seen that the teacher-child relationship has a potential power that cannot be ignored in the future development of children.

The QTCR is affected by many factors. Chen et al. (2020) proposed that higher teacher-student stress can seriously affect the quality of teacher-student relationship. There is also literature showing that children characteristics, teacher characteristics, and social environment attributes all have an impact on the teacher-child relationship (Rucinski et al., 2018). In addition, Sutherland et al. (2018) pointed out that children's problematic behaviors will also determine the interaction between teachers and children to a certain extent, thereby affecting the QTCR. Research by Trang and Hansen (2021) showed that children's interpersonal skills, teacher expectations, school race, and poverty rates all affect the QTCRs.

From the above research, it can be seen that the quality of the relationship between teachers and children will have an important impact on children's development. Therefore, it is necessary to conduct in-depth empirical research in order to improve the quality of preschool education. Ultimately, teachers are better able to foster high-quality relationships with children. However, through the existing literature, it is found that the existing research mainly focuses on the influence of preschool teachers' external conditions on the teacher-child relationship, while the research on the influence of teachers' internal psychological characteristics on the teacher-child relationship is still relatively scarce. Preschool teachers are the most important object in the teacher-child relationship, and their psychological characteristics will have an important impact on this relationship. Studies have shown that mindfulness can affect many psychological functions such as cognition, emotion, behavior and psychological functions of individuals (Basso et al., 2019), and these are important factors affecting the relationship between teachers and children (Anama-Green, 2020). Therefore, this study will focus on the relationship between preschool teachers' trait mindfulness and teacher-child relationship. In addition, we also introduced the two factors of emotional intelligence and empathy in the study to explore the mechanism of action of these two factors in this pathway.

Literature review and theoretical hypotheses

Trait mindfulness and QTCR

Mindfulness first originated in Eastern Buddhism, and was later introduced into the field of psychology by Western psychologists to relieve individual bad emotions and

psychological stress. Brown and Ryan (2003) believes that mindfulness refers to a highly focused attention, that is, people maintain their attention on the current event or experience, and accept it unconditionally without judgment. Mindfulness can be characterized both at both the state and at the trait level (Carmody & Baer, 2008). This study aims to examine the trait mindfulness of kindergarten teachers.

Attachment theory believes that the teacher-child relationship is an extension of the parent-child relationship in kindergartens, reflecting the emotional connection between teachers and children, and is a relatively stable relationship state (Bergin & Bergin, 2009). This relationship will not only affect children's physical and mental development and social adaptation (Camodeca & Coppola, 2019), but also continue to affect children's future academic performance and adjustment (Rucinski et al., 2018). In the teacher-child relationship, it is the teacher who plays the leading role. Therefore, some characteristics of teachers themselves will affect the quality of parent-teacher relationship. For example, Becker et al. (2017) mentioned in their research that building a good teacher-child relationship requires teachers to maintain a high level of emotional regulation and well-being.

Mindfulness can allow teachers to maintain more attention and awareness of the teaching process and teaching situations in stressful situations. This allows teachers to reduce depression and stress levels, which can have a more positive impact on teacher-student relationships (Becker et al., 2017). Braun et al. (2019) also pointed out that mindfulness can significantly positively predict teachers' professional well-being and classroom management level. At the same time, mindfulness is characterized by unconditional acceptance. If teachers can uphold this characteristic and treat children with an open and accepting attitude, they will be more sensitive to children's needs and treat them with a more tolerant attitude, and children will also feel positive emotions from teachers in the process, thereby developing a supportive teacher-child relationship (Frank et al., 2016).

Combining theory and previous literature, this study puts forward the following research hypothesis:

Hypothesis 1: Trait mindfulness is significantly positively correlated with the QTCR.

Trait mindfulness, emotional intelligence, and QTCR

Mayer and Salovey (1997) put forward the concept of emotional intelligence for the first time in a real sense. Emotional intelligence refers to the ability of people to obtain and recognize the emotional information of others and themselves, and use the acquired emotional information to guide their own thinking and behavior. This ability is defined as emotional intelligence.

Roberts (2002) emphasized that emotional intelligence includes multiple aspects, and it is the sum of a series of personality, emotion, and interpersonal capabilities that individuals have to meet their needs and cope with pressure. In general, people with high emotional intelligence are able to select and prioritize cognitive activities that are most beneficial to their current emotional state, and to change their emotions to better suit the current situation (Fiori & Vesely-Maillefer, 2018).

Kindergarten teachers are a high-pressure job (Leffler, 2018). They have to complete high-intensity tasks and bear high pressure from society. Therefore, preschool teachers are more likely to suffer from emotional distress than other educators, which will lead to serious psychological problems in the long run (Cheng et al., 2020). Relevant studies have shown that mindfulness plays a certain role in improving the emotional capacity of individuals. For example, Tomlinson et al. (2018) pointed out that mindfulness has a negative relationship with mental health problems, including anxiety, depression, stress, and emotional symptoms. Research has also shown that individuals with higher mindfulness highs are more able to recognize, understand, and accept negative emotions in current experiences (Cheung and Ng, 2019; Hsieh & Huang, 2020; Osborne & Atkinson, 2022). In addition, the mindfulness-based emotion regulation model (Chambers et al., 2009) also mentions that mindfulness practice helps individuals to consciously perceive their own and other people's emotions, and observe them with an "accepting" attitude, which can expand the relationship between the individual and emotions. The distance between them can help individuals enhance their emotional management ability and adaptive emotional function, that is, emotional intelligence.

Based on the emotional intelligence ability model (Mayer & Salovey, 1997), emotional intelligence includes the ability to recognize emotions, use emotions, understand emotions, and regulate emotions. In the teaching context, teachers need to have the above abilities if they want to build a good teacher-child relationship with children. That is, emotional intelligence was a significant predictor of the quality of the teacher-student relationship. Moreover, a high level of emotional intelligence can help teachers effectively deal with various problems of young children, provide more emotional support for young children, and then build a positive teacher-student relationship.

Combining theory and previous literature, this study puts forward the following research hypotheses:

Hypothesis 2: Emotional intelligence plays a mediating role in trait mindfulness and QTCR.

Hypothesis 2a: Trait mindfulness is significantly positively correlated with emotional intelligence.

Hypothesis 2b: Emotional intelligence is significantly positively correlated with the QTCR.

Trait mindfulness, empathy, and QTCR

Empathy, defined as the ability to feel and understand the emotions of others, is widely recognized as a multifaceted construct containing both cognitive and affective components (Buck et al., 2017). Empathy is a necessary trait and skill for preschool teachers, and it is one of the key factors affecting the success of preschool teachers' work (Vučinić et al., 2022; Wang et al., 2019; Vaquier et al., 2020). Therefore, empathy is considered to be one of the core contents of the professional development of preschool teachers (Bullough, 2019). In addition, empathy plays a very important role in interpersonal relationships. It helps us feel the relationship with others, understand the inner activities of others and improve emotional states. Therefore, empathy is also considered as a way to regulate interpersonal relationships (Zaki, 2020; Zhang et al., 2021).

According to the emotion sharing theory (Jeannerod, 1999), individuals will only have empathy when they perceive other people's voices, expressions or actions, and spontaneously imitate others. It can be seen that the ability to care about and feel the emotions of others is an important factor affecting the generation of empathy. Research by Centeno and Fernandez (2020) has shown that mindfulness practice can improve individuals' ability to care for others through self-awareness, and it can also enable people to see problems from other people's perspectives to understand others' thoughts and feelings. Research by MacDonald and Price (2017) also shows that trait mindfulness is related to empathy. This is because individuals with empathy are better able to recognize emotions and conscious attention to one's own or others' feelings and thoughts is a core feature of mindfulness.

The theory of empathy proposed by Rogers (1974) pointed out that empathy, as the basic condition of communication and counseling work, is of great significance for individuals to understand the feelings of others during interaction. Teacher-child interaction needs frequent communication. Empathy can better allow teachers to understand children's feelings, thereby promoting the development of the QTCR. Studies have shown that teachers' empathy and emotional regulation ability will reduce self-centeredness and effectively promote the development of teacher-child relationship (Lavy & Berkovich-Ohana, 2020; Haslip et al., 2019). Moreover, empathy also helps teachers understand and respond to students' need, give students encouragement and support, and help students develop their true potential (Meyers et al., 2019), which is very important for building a good teacher-child relationship.

Combining theory and previous literature, this study puts forward the following research hypotheses:

Hypothesis 3: Empathy is a mediating variable between trait mindfulness and QTCR.

Hypothesis 3a: Trait mindfulness is positively correlated with empathy.

Hypothesis 3b: Empathy is positively correlated with QTCR.

Emotional intelligence and empathy

Research has shown a significant correlation between emotional intelligence and empathy (Beauvais et al., 2017; Silva & Toledo Júnior, 2021). Fernández-Abascal and Martín-Díaz (2019) argue that emotional intelligence and empathy are related but distinct constructs and that there are similarities between their key concepts. Empathy is one aspect of the connotation of the concept of emotional intelligence. Empathy mainly refers to recognizing the emotions of others and giving appropriate feedback and expression in verbal or non-verbal forms. Emotional intelligence is in addition to the above content, also includes self-awareness, mentality management, self-motivation and relationship management with others (Dellaria Doas, 2011).

Based on the Emotional Intelligence Competence Model (Mayer & Salovey, 1997), Emotional intelligence includes skills related to processing emotional information, including perceiving emotions, using emotions to facilitate thinking, understanding emotions, and regulating emotions in oneself and others. Thus, emotional intelligence and empathy have a strong correlation. Preschool teachers with high emotional intelligence can better perceive, understand and manage their own and children's emotions in the process of interacting with children. They are able to display more emotional awareness in the process, which can prompt early childhood teachers to better understand young children's emotions and behaviors. They are also more able to manage their emotions and adopt more appropriate positive emotions towards young children's behavior.

Combining theory and previous literature, this study puts forward the following research hypotheses:

Hypothesis 4: Emotional intelligence is positively correlated with empathy.

At the same time, based on the review and theoretical basis of the relationship between the above four variables, we propose Hypothesis 5.

Hypothesis 5: Emotional intelligence and empathy play a chain mediating role between trait mindfulness and QTCR.

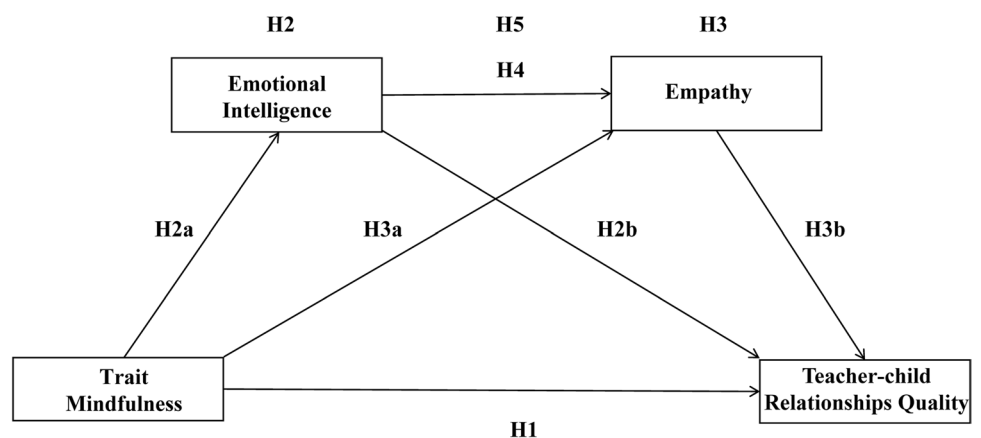
The theoretical hypothesis model diagram of this study is shown in Fig. 1.

Materials and methods

Participants

The cluster random sampling method was used in this study. With the help of the education management department of Jinan, Shandong Province, we randomly sampled all kindergartens in Jinan through computerized random selection. All kindergarten teachers participated in the survey, while kindergarten managers and childcare workers did not participate in the survey. Finally, 317 valid questionnaires from preschool teachers were included in the data analysis of this study. They are from 20 kindergartens in Jinan, Shandong Province, China. Among the kindergarten teachers surveyed, there were 10 male teachers, accounting for 3.20% of all investigators, and 307 female teachers, accounting for 96.80% of all investigators (see Table 1 for the demographic information of the surveyed kindergarten teachers). This reflects the real situation of the gender ratio of kindergarten teachers in China (Ministry of

Fig. 1 Theoretical hypothesis



Education of the People's Republic of China, 2020). The distribution and collection of the questionnaires were carried out by specialized personnel using pen and paper tests. At the beginning of the survey, we distributed a total of 366 questionnaires, and actually returned 343 questionnaires. In the process of data screening and entry, we directly eliminated questionnaires with obvious filling errors and missing answer items. After screening, 317 effective questionnaires were finally obtained in this investigation, and the effective questionnaire recovery rate was 86.61%. This study followed the guidelines of the Declaration of Helsinki, and the research ethics committee of the first author's institution approved the ethical review of this study.

Measure

Five facet mindfulness questionnaire

Five Facet Mindfulness Questionnaire (Baer et al., 2006) is an internationally accepted and authoritative scale for measuring trait mindfulness. The Five Facet Mindfulness Questionnaire consists of 39 items. An example item on the scale is, "When I have a sensation in my body, it's hard for me to describe it because I can't find the right words". Deng et al. (2011) translated the scale and tested its reliability and validity in the Chinese population. In Chinese populations, this scale has been widely used (Song et al., 2021; Liu et al., 2021). The scale uses a five-point Likert-type scale, and respondents are asked to select an option to rate the frequency of each item (1 = never or very rarely, and 5 = very often or always). The coefficient alpha of Five Facet Mindfulness Questionnaire was 0.956, and the coefficient alpha of the sub-dimension scales of Five Facet Mindfulness Questionnaire were 0.902, 0.882, 0.914, 0.861, and 0.893, respectively.

Emotional intelligence scale

Wong and Law (2002) compiled the Emotional Intelligence Scale in 2002, which is divided into four parts: self-emotion appraisal (SEA), others' emotion appraisal (OEA), use of emotion (UOE), regulation of emotion (ROE). Law et al. (2004) translated and revised the Chinese version of the scale and proved that it has good reliability and validity among Chinese people. The Emotional Intelligence Scale has 16 items. A sample item was, "I always set goals for myself and then try my best to achieve them". The scale uses a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The coefficient alpha of the Emotional Intelligence Scale was 0.918, and the coefficient alpha of the four sub-dimensions of Emotional Intelligence Scale were 0.895, 0.852, 0.904, and 0.861, respectively.

Empathy

The Interpersonal response Index (IRI) was used to assess the psychometric nature of empathy. The Interpersonal response Index was compiled by Davis (1983), and the Chinese Interpersonal Response Index (C-IRI) was translated by Siu and Shek (2005). The Chinese Interpersonal Response Index (C-IRI) is a 28-item self-report questionnaire consisting of three sub-scales, including fantasy (FS), empathetic concern (EC) and personal distress (PD). A sample such as, "Easily put self in place of character in movie". Participants were asked to rate how much each item described them on a Likert-5 scale from 0 (does not describe me well) to 4 (describes me well). The higher the sub-scale score, the better the functioning of all aspects of empathy. The coefficient alpha of the Interpersonal response Index was 0.955, and the coefficient alpha of the three sub-dimensions of the Interpersonal response Index were 0.829, 0.949, and 0.922, respectively.

Teacher-child relationship quality

Preschool teachers evaluated their relationship with target children using the Teacher-student Relationship Scale (STRS; Pianta & Steinberg, 1992). The scale has been proven to have good reliability and validity in China (Zhang & Nurmi, 2012; Guo et al., 2015). STRS consists of 28 items and three sub-scales, namely closeness, conflict and dependency. An examples such as, "This child openly shares his/her feelings and experiences with me". Participants were asked to rate how much each item described them on a Likert-5 scale from 1 (definitely not applicable) to 5 (definitely applicable). Scores are calculated by averaging the items. The conflict sub-scale is a reverse integral question, so a high score represents a positive relationship characterized by trust, warmth, and low conflict. The coefficient alpha

Table 1 Social demographic features of participants ($N=317$)

Variables		Percentages
Gender	Male	3.20%
	Female	96.80%
Age	20–25	11.04%
	26–30	54.26%
	30–35	12.30%
	36–40	9.78%
	41–45	10.09%
	46–50	2.52%
Educational Background	Junior college	70.00%
	Undergraduate course	30.00%

of the STRS was 0.935, and the coefficient alpha of the three sub-dimensional STRS were 0.912, 0.890, and 0.772, respectively.

Data analysis method

SPSS 22.0 and Mplus 8.3 were used in the data analysis part of this study. We use SPSS 22.0 to enter the questionnaire data and conduct statistical analysis of demographic data. Mplus 8.3 was used to test the model fit and mediation effect test. In the test of the model, the gender, age and educational background of kindergarten teachers were used as control variables.

Results

Test of common method deviation

Using Harman single factor test method, 20 factors with characteristic root greater than 1 were obtained. The results show that the explanation rate of the first factor is 23.739%, which is far less than 40%. This suggests that there is no common method bias in the data in this study (Podsakoff et al., 2003).

Descriptive statistical analysis

Table 2 lists the major variables and Pearson correlation coefficients between each dimension. It can be seen from Table 2 that the three sub-dimensions of QTCR were significantly positively correlated with the five subdimensions of trait mindfulness. The three subdimensions of QTCR were significantly positively correlated with the four sub-dimensions of emotional intelligence. The three subdimensions of QTCR were significantly positively correlated with the three sub-dimensions of empathy. Data analysis showed that the correlation coefficients of all variables were less than 0.75, and there was no serious multicollinearity problem among the main variables (Tsui et al., 1995).

Model inspection

The model was fitted by Mplus, the fitting index of the model was ML $\chi^2 = 276.434$, $df = 120$, $\chi^2/df = 2.304$, CFI = 0.926, TFI = 0.908, RMSEA = 0.064, SRMR = 0.043. Each index is in an acceptable range, and the model is ideal. See Table 3.

The significance test of mediating effect

On the basis of good model fitting, the Bootstrap program of Mplus was used to repeat the sample for 5000 times. The results show that the path coefficients of trait

mindfulness, emotional intelligence, empathy, and QTCR are all significant.

Structural equation modeling show that trait mindfulness is positively related to QTCR ($\beta = 0.173$, $p = 0.026$). This result supports hypothesis H1 of this study. Trait mindfulness is positively related to emotional intelligence ($\beta = 0.497$, $p < 0.001$). This result supports hypothesis H2a of this study. Emotional intelligence is positively related to QTCR ($\beta = 0.280$, $p = 0.001$). This result supports hypothesis H2b of this study. Trait mindfulness is positively related to empathy ($\beta = 0.320$, $p < 0.001$). This result supports hypothesis H3a of this study. Empathy is positively related to QTCR ($\beta = 0.412$, $p < 0.001$). This result supports hypothesis H3b of this study. Emotional intelligence is positively related to empathy ($\beta = 0.252$, $p = 0.003$). This result supports hypothesis H4 of this study. See Table 4.

The indirect paths and path coefficients for this study are shown in Table 5. Emotional intelligence mediates the relationship between trait mindfulness and QTCR ($\beta = 0.118$, $p = 0.004$), with 95% confidence interval [0.054–0.218]. This interval does not include 0, which supports hypothesis H2 of this study. The mediating effect of emotional intelligence accounts for 28.03%.

Empathy mediates the relationship between trait mindfulness and QTCR ($\beta = 0.112$, $p = 0.001$), with 95% confidence interval [0.054–0.197]. This interval does not include 0, which supports hypothesis H3 of this study. The mediating effect of empathy accounts for 26.60%.

Emotional intelligence and empathy play a chain mediating role in the relationship between trait mindfulness and QTCR ($\beta = 0.044$, $p = 0.038$), with 95% confidence interval [0.014–0.099]. This interval does not include 0, which supports hypothesis H5 of this study. Emotional intelligence and empathy sequence mediation accounted for 10.45% (Fig. 2).

Discussion

The current study shows that preschool teachers' trait mindfulness significantly and positively predicts QTCR. Preschool teachers with a higher level of trait mindfulness are more able to view children's behaviors in a non-critical and objective manner (Lemberger-Truelove et al., 2018), especially to show acceptance and tolerance towards children's unfriendly behavior, which is conducive to strengthening the relationship between preschool teachers and children. The interaction between children and the environment produces mutual and changing effects. In the teacher-child interaction, the cognition of each other will be embodied, and they will like or hate each other more, and further interact with each other, thus affecting the development of the QTCR. Teachers with higher levels of trait mindfulness will adopt a more objective and tolerant attitude towards children when

Table 2 Means, standard deviations, and correlations of the major study variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Gender	0.970	0.175	1																	
2. Age	30.420	6.318	0.109	1																
3. Educational Background	1.300	0.459	0	0.034	1															
4. Observe	3.248	0.830	-0.049	-0.021	0.01	1														
5. Describe	3.493	0.740	-0.017	0.015	0.028	.565**	1													
6. ActAware	3.467	0.895	-0.029	0.062	0.007	.538**	.605**	1												
7. NonJudge	3.311	0.691	-0.02	-0.034	.127*	.621**	.533**	.446**	1											
8. NonReact	3.423	0.848	0.017	0.037	0.01	.540**	.553**	.663**	.536**	1										
9. SEA	4.419	1.310	-0.108	.162**	0.092	.171**	.334**	.205**	.294**	.319**	.538**	1								
10. OEA	4.280	1.400	-0.035	0.069	.192**	.287**	.341**	.239**	.335**	.319**	.538**	.538**	1							
11. UOE	4.573	1.364	-0.09	.135*	0.104	.335**	.299**	.334**	.207**	.187**	.564**	.454**	.564**	1						
12. ROE	4.549	1.287	-.112*	0.084	0.1	.278**	.256**	.202**	.328**	.251**	.496**	.468**	.387**	.496**	1					
13. FS	2.355	0.679	-0.07	.204**	0.082	.297**	.291**	.188**	.291**	.228**	.259**	.216**	.299**	.223**	.259**	1				
14. EC	2.187	0.902	-.129*	.228**	0.095	.347**	.338**	.220**	.396**	.337**	.345**	.319**	.292**	.266**	.669**	.669**	1			
15. PD	2.239	0.788	-0.012	.225**	0.082	.243**	.251**	.162**	.243**	.229**	.274**	.219**	.259**	.156**	.653**	.561**	.653**	1		
16. Closeness	2.999	0.711	-0.109	0.051	0.036	.291**	.367**	.250**	.315**	.305**	.360**	.368**	.257**	.279**	.381**	.407**	.299**	.381**	1	
17. Conflict	2.985	0.596	-0.101	0.101	0.058	.249**	.404**	.275**	.298**	.254**	.381**	.291**	.297**	.229**	.390**	.469**	.384**	.469**	.384**	1
18. Depend-ency	2.712	0.578	-0.048	-0.035	0.016	.220**	.272**	.178**	.186**	.281**	.215**	.271**	.218**	.161**	.280**	.252**	.206**	.486**	.562**	.206**

Gender is the dummy variable (0 = male, 1 = female)

SEA Self-emotion appraisal, OEA Others' emotion appraisal, UOE Use of emotion, ROE Regulation of emotion, FS Fantasy Scale, EC Empathetic Concern, PD Personal Distress

** $p < 0.01$, * $p < 0.05$

Table 3 Fit indices of the model

Fit indices	Recommended threshold	Scores	Remarks
ML χ^2	–	276.434	–
Df	–	120	–
χ^2/df	$1 < \chi^2/df < 3$	2.304	Acceptable
CFI	> 0.9	0.926	Acceptable
TLI	> 0.9	0.908	Acceptable
RMSEA	< 0.08	0.064	Acceptable
SRMR	< 0.08	0.043	Acceptable

dealing with teachers-children conflicts and children’s mistakes, thereby promoting a virtuous circle of QTCR.

The current study also found that trait mindfulness predicts QTCR through emotional intelligence, and the path coefficient ratio is 28.03%. The analysis results of this study by structural equation modeling showed that trait mindfulness can significantly and positively predict emotional intelligence, which is consistent with previous research (Ramos Díaz & Salcido Cibrián, 2017; Miao et al., 2018; Mestre et al., 2019). Through mindfulness training, teachers can feel emotions without making judgments about right and wrong, and can naturally regulate emotions, thus promoting the development of emotional intelligence. Emotional intelligence plays an important role in the interaction process between preschool teachers and young children. This result further validates the viewpoint of the emotional intelligence competency model (Mayer &

Salovey, 1997). Trait mindfulness focuses on the attitude of unconditional acceptance and non-judgmental. In reality, this has the same competency requirements as emotional intelligence. In the teaching situation, preschool teachers with high emotional intelligence can perceive and regulate their own and children’s emotions, which helps them form good interpersonal relationships. At the same time, they are often better at creating a relaxed and happy emotional atmosphere in classroom teaching, so that children can learn in a relaxed environment. Young children also enjoy positive interactions with teachers. This active interaction is very beneficial to improve the QTCR.

This study further found the mediating effect of empathy between trait mindfulness and the QTCR, with an effect value of 26.60%. The theory of emotional sharing (Jeanerod, 1999) indicates that the individual’s awareness of other people’s voice, expression or actions and spontaneously imitate of other people’s behaviors are the basis for empathy. Teachers’ perception of children’s emotions and caring for children are important factors affecting empathy. Teachers with characteristic mindfulness can be keenly aware of their own and children’s emotions, and can think about problems from the perspective of children, so their empathy ability will also be higher. Based on Rogers’ theory of empathy (Rogers, 1974), empathy, as a basic condition of communication, is of great significance for individuals to understand the feelings of others when interacting. The teacher-child interaction needs frequent communication. Empathy can better enable teachers to understand children’s feelings, so as promoting the development of the QTCR.

Table 4 The direct effect of the research paths and research model hypothesis analysis

DV	IV	Std.Est.	S.E.	Est./S.E.	P Value	R ²	Hypo and Path	Remarks
TCRQ	TM	0.173	0.078	2.223	0.026	0.480	H1: TM → TCRQ	Support
	EI	0.280	0.082	3.407	0.001		H2b: EI → TCRQ	Support
	Empathy	0.412	0.075	5.468	***		H3b: Empathy → TCRQ	Support
EI	TM	0.497	0.062	8.071	***	0.311	H2a: TM → EI	Support
	Empathy	0.320	0.075	4.296	***		0.332	H3a: TM → Empathy
Empathy	TM	0.320	0.075	4.296	***	0.332	H4: EI → Empathy	Support
	EI	0.252	0.085	2.959	0.003			

*** $p < 0.001$

TCRQ Teacher-child relationships quality, TM Trait mindfulness, EI Emotional intelligence

Table 5 The indirect effect of the research paths

Path	Std.Est.	S.E.	Est./S.E.	P Value	Boot LLCI	Boot ULCI	The proportion of the effect
H2: TM → EI → TCRQ	0.118	0.041	2.904	0.004	0.054	0.218	28.03%
H3: TM → Empathy → TCRQ	0.112	0.035	3.190	0.001	0.054	0.197	26.60%
H5: TM → EI → Empathy → TCRQ	0.044	0.021	2.074	0.038	0.014	0.099	10.45%
TOTALIND	0.274	0.059	4.651	***	0.174	0.412	65.08%
TOTAL	0.421	0.068	6.178	***	0.293	0.562	100.00%

*** $p < 0.001$

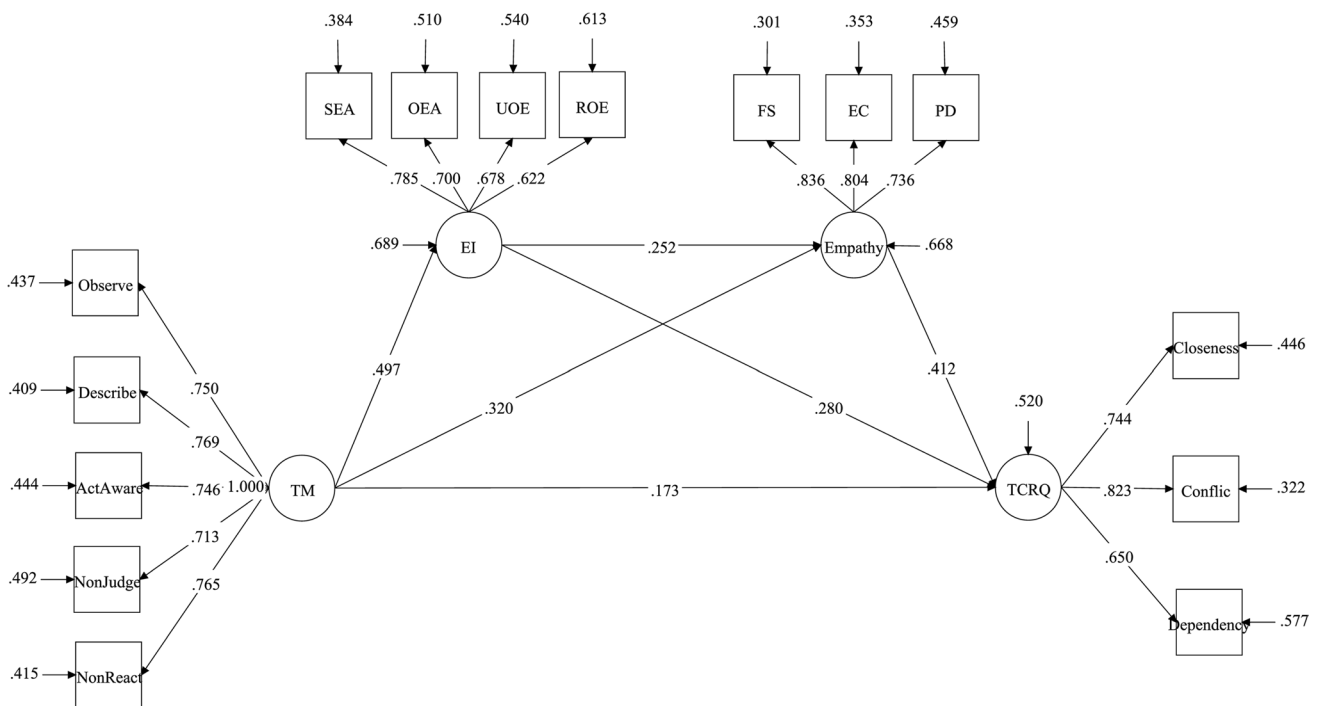


Fig. 2 Structural equation model

This study also confirmed the chain mediating role of emotional intelligence and empathy in trait mindfulness and QTCR. Trait mindfulness can not only affect the QTCR through the two single mediating paths of emotional intelligence and empathy, but also produce a chain mediating effect through the two variables of emotional intelligence and empathy, and the mediating effect value is 10.45%. The conclusions of this study enrich attachment theory, teachers are regarded as children’s temporary attachment figures, and the centrality of the attachment behavior process in the teacher-student relationship is considered to depend on several factors, including children’s age and vulnerability. For younger or more vulnerable children, the teacher’s role as an attachment figure will be even more important. The attachment system of these children is more likely to be activated, and their self-regulation ability is relatively limited, so the help provided by teachers is crucial for their survival and growth (Verschueren & Koomen, 2012).

Attachment theory emphasizes the importance of teachers’ sensitivity or responsiveness to children’s needs as central proximal determinants or prerequisites of relationship quality (Buyse et al., 2011; Davis, 2003). However, this study found that teachers’ own traits, emotional intelligence, and empathy also play an important role in the QTCR. This further verified the diversity of proximal factors in attachment theory, and confirmed the influence of teachers’ own characteristics and abilities on the QTCR.

Meanwhile, this research also provides an empirical basis for the development of the QTCR in kindergartens. To improve the QTCR, kindergarten managers should include training to improve teachers’ mindfulness ability in the training, and can introduce related methods of mindfulness

training so that teachers can master the skills of mindfulness. In the process of interacting with children, teachers can better control their emotions and treat children with a more acceptable attitude. This good teacher-student relationship is very beneficial. Kindergarten managers also can regularly train preschool teachers’ ability to manage and use emotions, so that preschool teachers can realize the importance of emotional intelligence in teacher-child interaction. For teachers, in children’s daily life, they should be keenly aware of their own and children’s emotional state and can respond to children’s emotions in an appropriate way. Increase emotional talk with children, care for children in time, and help children understand their emotions. Kindergartens can also take empathy ability as one of the necessary dimensions of teachers’ professional development assessment, and give teachers more support for improving empathy ability in teachers’ professional development. Teachers can be provided with a collective activity platform, such as training on empathy, organizing teachers to do charity and volunteer work, etc. Use these activities to cultivate their positive and optimistic character, improve the ability to deal with people, and enhance their empathy. This can further improve the QTCR.

Limitations and future research directions

Firstly, the method of cross-sectional research was used in the data collection of the current study. Although the research is based on a large number of solid theoretical foundations and uses scale tools with high reliability and validity for empirical

research, cross-sectional research has its limitations after all. Therefore, in the future, longitudinal research methods can be used for in-depth research. Secondly, this study only considered the two factors of emotional intelligence and empathy, and there may be other variables, such as self-efficacy. Thirdly, this study obtained the relevant factors that affect the QTCR, however, no experimental research was used to re-verify the influence among variables. In the future, more rigorous experimental research can be considered to prove the relationship and influence among variables. Finally, this survey was conducted during the COVID-19 pandemic, and the sentiment of respondents may be affected by this global public health event (Li et al., 2022; Tan et al., 2021). This may bias the data to some extent. In the future, relevant comparative research can be considered after the pandemic is over.

Conclusion

The results of this study show that trait mindfulness positively predicts the quality of the parent-teacher relationship. Emotional intelligence plays a mediating role between trait mindfulness and QTCR, and empathy plays a mediating role between trait mindfulness and QTCR. At the same time, emotional intelligence and empathy play a chain mediating role in relationship between trait mindfulness and QTCR. On the one hand, this study enriches attachment theory. The conclusions of this study verify the diversity of proximal factors in attachment theory, and confirm the influence of teachers' own characteristics and abilities on the QTCR. On the other hand, by exploring the factors affecting the QTCR, we can find ways to improve teacher-child relationship from a new perspective, and then provide some new methods and approaches for improving the quality of kindergarten teacher-child relationship.

Funding This paper was supported by Major Cultivating Projects of Leading Talents in Philosophy and Social Sciences of Zhejiang Province "Aiming for Common Prosperity: Improvement and Evaluation of Early Childcare Quality Driven by Multimodal Data Fusion"(23YJRC13ZD); the Zhejiang Provincial Educational Science Planning Project: Research on the Construction of the Public Service System for Infant and Toddler Education in Zhejiang Province (No. 2021SCG146). This project supported by the Graduate Scientific Research Foundation of Wenzhou University. This project also supported by the Sunlory Educational Institute.

Declarations

Ethics approval The studies involving human participants were reviewed and approved by the Research Ethics Committee of the Wenzhou University. Written informed consent to participate in this study was provided by the participants.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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