

Mindfulness, Emotion, and Behavior: An Intervention Study with Chinese Migrant Children

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Migrant children in China who move from rural to urban areas face significantly greater emotional and behavioral challenges than their urban peers. In recent decades, western countries have used mindfulness to enhance child psychosocial and behavioral outcomes. This approach has not yet been systematically applied to rural-to-urban migrant children in China. This study utilized one-group pretest-posttest design to examine the effects of a 4-week school-based mindfulness intervention on Chinese migrant children's emotions and behaviors. The results show that mindfulness training significantly improved participants' mindfulness. The training was particularly effective for those with lower mindfulness at baseline. There was significant decrease in students' internalizing and externalizing problems after mindfulness training, particularly internalizing problems.

Keywords: mindfulness, emotion, behavior, migrant children, China, intervention

Introduction

Emotional and Behavioral Challenges of Migrant Children

Three decades of urbanization in China has prompted millions of people moving from rural to urban areas. To date, 278 million rural migrant workers reside in urban areas, which account for one fifth of China's national population (China National Bureau of Statistic, 2016). "Migration" is defined uniquely in China as it not only means moving from one region to another, but whether being officially documented as a "local" resident. Based on China's Household Registration System, every individual is registered at his/her family origin. Moving across regions, particularly from rural areas to large cities, requires government approval and documentation. The local registration in urban areas also determines the access to public welfare benefits, such as healthcare and public education (Lu, Lin, Vikse, & Huang, 2016). As populations in metropolises grow in recent years, rural migrants can hardly acquire local resident status in large cities, such as Beijing.

While living in cities without an official residency, migrant families are often excluded from public welfare. One of the biggest challenges facing these families is their children's scarce access to public education. For instance, many urban public schools require various documents for admission, such as proof of parents' participation in local social security system and long-term rental payments. Many migrant families, who do not have stable jobs or housing, cannot provide such documents and therefore have to apply for private schools that are specifically for migrant children. These schools have poorer teaching quality, facilities, and limited funding than schools for local students (Dong, 2010).

Being marginalized in urban areas, migrant children are more likely to

have emotional and behavioral problems than their urban counterparts. For instance, their activities are often limited within school, home, and neighborhood, which may lead to inadequate social skills and loneliness (Fan, Fang, Liu, & Liu, 2009; Li & Li, 2007). Migrant children are found to have more social anxieties, conduct problems, hyperactivity, and inattention problems, as well as fewer prosocial behaviors (Chen, Wang, & Wang, 2009; Hu, Lu, & Huang, 2014; Lee, 2011).

Though studies have shown the emotional and behavioral challenges faced by Chinese migrant children, there is a paucity of research using evidence-based intervention to help migrant children deal with these challenges. As a pilot study, this study explores an emerging approach to address this gap.

Mindfulness, Emotion, and Behavior

Mindfulness refers to an awareness of individuals' internal and external experiences. It also contains a non-judgmental, open attitude toward the experiences. Increasing studies have found that mindfulness can be a new treatment for adolescents' emotional and behavioral problems, such as anxiety and Attention Deficit and Hyperactivity Disorder (ADHD; Semple, Lee, Rosa, & Miller, 2010; Van de Oord, Bogels, & Peijnenburg, 2012). For instance, an 8-week mindfulness training in Netherlands with 14 adolescents who had externalizing disorders showed that mindfulness training substantially reduced adolescents' internalizing and externalizing problems and improved their happiness and mindfulness awareness (Bogels, Hoogstad, van Dun, de Schutter, & Restifo, 2008).

Recent research also shows positive effects of applying mindfulness in non-clinical settings. Several school-based mindfulness interventions have found significant improvement in stu-

dents' ability of paying attention and participation in school activities (Black & Fernando, 2014; Napoli, Krech, & Holley, 2005; Schonert-Reichl & Lawlor, 2010). For instance, a school-based mindfulness intervention was conducted among 409 ethnic minority students in a U.S. public elementary school. Students participated in mindfulness training for 5 weeks, with 3 times per week, 15 minutes per session. The curriculum included mindful listening, breathing, walking, eating, test-taking, and so forth. The study found that mindfulness was positively related to students' concentration, self-control, and classroom activity participation (Black & Fernando, 2014).

In another study, 246 fourth to seventh graders in Canada participated in a school-based mindfulness intervention (139 received mindfulness training and 107 did not), which was delivered by teachers that were trained with mindfulness curriculum. The intervention focused on breathing, mindful sensation, managing negative emotions, and self-acknowledgement. After 9 weekly sessions, each approximately 40–50 minutes, students who participated in the intervention showed significantly increased optimism and teacher-rated social competent behaviors in classroom (Schonert-Reichl & Lawlor, 2010). As an emerging field, however, the effects of school-based mindfulness practice have not been examined across cultural contexts, including migrant children in China.

Resilience Theory

Resilience refers to a dynamic process that encompasses positive adaptation within significant adversities (Luthar, Cicchetti, & Becker, 2000; Luthar, 2003). Significant adversities, or so-called risk factors, include conditions or experiences that increase the likelihood of forming, maintaining, and exacerbating problems (Fraser & Terzian, 2005). Certain people, howev-

er, show better outcomes than others in similar adverse situations (Rutter, 2012). This may attribute to their engagement with factors that protect them against risks (Jenson & Fraser, 2010).

Risk and protective factors manifest on individual and environmental levels (Jenson & Fraser, 2010). On the individual level, risk factors may include poor self-control and emotional dysregulation; protective factors may include positivity, independence, and reflectivity (Daniel & Wassell, 2002; Jenson & Fraser, 2010). On the environmental level, risk factors may include poverty and neighborhood disorganization, while protective factors may involve educational and economic opportunities (Jenson & Fraser, 2010).

Research has discussed the positive impact of resilience on child development (Luthar, 2003). Most literature, however, is based on western populations and cultures (Ungar, 2008). In the recent years, research begins to highlight that contributing factors to resilience are specific to cultures and contexts (Rutter, 2007; Ungar, 2008). For migrant children in China, their environmental adversities include low socioeconomic status, inadequate educational opportunities, and marginalization in urban areas (Chen, Wang, & Wang, 2009; Lu et al., 2016). Moreover, they may be particularly vulnerable to these risks due to their emotional and behavioral challenges.

The negative influence of these adversities and vulnerabilities, however, may be altered by protective mechanisms, such as successful coping (Rutter, 1987). Therefore, mindfulness, which has shown effectiveness in child emotional regulation and psychosocial adjustment, may be an effective intervention to build protective mechanisms for migrant children in the Chinese context.

Given the significant challenges facing migrant children in China and

the paucity of mindfulness practice with this population, our study examines the effects of a mindfulness intervention on Chinese migrant children's emotional and behavioral outcomes. Based on existing evidence on mindfulness practice among children, as well as resilience theory, we hypothesize that mindfulness intervention will improve Chinese migrant children's levels of mindfulness, which can serve as a protective factor for their emotional and behavioral well-being.

Method

Data

Our study was conducted at a migrant school that enrolls a large number of migrant students in Beijing (approximately 1,200) and has established for over ten years. The students came from diverse geographic areas. Some were born in Beijing, though they are still considered "migrants" without local registration status. Many migrated from other provinces such as Henan, Shandong, and Hebei. This resembles the demographics of migrant laborers in Beijing that over 60% of them are from large agricultural provinces, including Hebei, Henan, Shandong, Anhui, Shanxi, and Sichuan (Beijing Municipal Bureau of Statistics, 2017).

This study utilized one-group pretest-posttest design to examine the effects of a 4-week school-based mindfulness intervention on Chinese migrant children's emotions and behaviors. Our participants were from two randomly selected fifth-grade classes (among four classes). The pretest included 93 students and 22 of them moved to other regions before the posttest. Another two cases had incomplete information on key variables, our final sample size, thus, was 69. The attrition rate is 25.8%. The high attrition rate largely highlights the frequent movement of migrant children in China, who are required to attend

high school in their rural hometown (Chen et al., 2009), where the curricula may differ from their city. Many migrant parents, therefore, choose to send their children to hometown schools after or later in elementary school, so that the child can adjust to hometown curricula earlier. Further sample analysis, as shown in Appendix, showed that there were no significant differences in pretest demographic, mindfulness, and internalizing and externalizing problems between those who completed the study and those who did not, except for birth place. Students whose birth place was not in Beijing were more likely to move than their counterparts. This may be due to the admission policy of local junior high schools, which largely require local residence and proof of graduation from local elementary schools.

Procedure

Participants were asked to complete a pretest survey in their classrooms before the intervention began on March 2016. The questions included their mindfulness, internalizing and externalizing problems, and general demographic information such as gender, age, and whether born in Beijing.

Eight sessions of mindfulness training were then provided to the participants over four weeks (i.e. two sessions per week) of March 2016. The training was conducted in classrooms during students' regular class time. Each session lasted about 45 minutes. The training was conducted in Chinese. All training sessions were led by a licensed clinical social worker and a bilingual licensed social worker, and assisted by bilingual local school social work interns who helped with disseminating activity materials and monitoring individual students' practice. Teachers were also invited to join the training activities upon their availability though they only attended 1-2 sessions due to schedule conflicts.

The training manual was based on

Mindfulness-based Cognitive and Behavioral Intervention for Children, which was developed by the research team. The training manual was developed based on mindfulness concepts and approaches and adapted for children. Each session involves a topic related to children's daily life, including: recognizing feelings, breathing exercise, mindful eating, emotion management, distress tolerance, rational decisions, expressing gratitude, and mindful breathing. Following the eight training sessions, local social work interns provided eight weekly review sessions over the following two months, April to June of 2016. Each session (approximately 30 minutes) reviewed one training activity and reminded students to continue practicing on their own.

Originally, we planned to conduct the posttest survey in early July, before the summer break. However, due to time conflict with school term tests, we conducted the posttest in September 2016, the first week of fall semester. The questions were the same as pretest (i.e. level of mindfulness, internalizing problems, and externalizing problems). Both pretest and posttest survey took approximately 20 minutes each. The researchers were in the classroom to distribute and collect surveys and answer participants' questions.

Measures

Dependent Variables. We used a short version of the Self-Description Questionnaire (SDQ; Bendheim-Thoman Center for Research on Child Wellbeing, 2013; Marsh, 1990) to measure child emotional and behavioral outcomes, which included both internalizing and externalizing problems (Bogels et al., 2008).

The SDQ-short version included 14 items regarding children's internalizing and externalizing problems. Internalizing problems, or problems manifested in thoughts and feelings, were comprised of eight items: "I feel sad a

lot of the time," "I often feel lonely," "I feel angry when I have trouble learning," "I worry about doing well in school," "I worry about finishing my work," "I worry about taking tests," "I worry about having someone to play with at school," and "I feel ashamed when I make mistakes at school." The Cronbach's alpha of these items is 0.79.

Externalizing problems, namely problems in outward behavioral outcomes (Bogels et al., 2008) were measured by six items: "I get distracted easily," "It's hard for me to finish my school work," "It's hard for me to pay attention," "I often argue with other kids," "I get in trouble for fighting with other kids," and "I get in trouble for talking and disturbing others." The Cronbach's alpha of these items is 0.70.

The Chinese version of SDQ, which showed good reliability, validity, and cultural applicability for Chinese adolescents (Leung, Marsh, Craven, & Abduljabbar, 2016; Marsh, Kong, & Hau, 2000; Yeung & Lee, 1999), were used. On a 0–3 scale, participants rated their frequency of having these problems in their daily lives. The answers ranged from "not at all true" to "very true." Summing all items, internalizing problems ranged 0–24 and externalizing problems ranged 0–18. The total of internalizing and externalizing problems, the SDQ sum score, ranged 0–42. Higher scores indicate more problems.

Key Independent Variable. Our key independent variable was the changed level of mindfulness before and after the intervention. Mindfulness was measured by the 15-item Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). The items describe everyday experience in mindful thoughts, behaviors, and feelings, such as "I break or spill things because of carelessness, not paying attention, or thinking of something else," "I find myself doing things without paying attention," and "I rush through activi-

ties without being really attentive to them." The Chinese version of MAAS was applied in Chinese college students and showed reliability and validity (Deng et al., 2012).

The participants rated their frequency of these experiences from 1 (i.e. almost always) to 6 (almost never). The sum score of the 15 items indicates level of mindfulness. Ranging from 15 to 90, higher score means higher level of mindfulness.

Covariates. Our analyses controlled for demographic and personal background information that may influence child emotional and behavioral outcomes, including gender, age, whether born in Beijing, whether the student transferred school(s) since first grade, and family structure (i.e. who the child lives with).

Analytic Strategy

We conducted descriptive, bivariate, and multivariate inferential analyses. The descriptive analysis showed frequency and mean distribution of main variables. One of the bivariate analyses examined children's levels of posttest mindfulness by pretest mindfulness. Based on their pretest mindfulness scores, participants were divided into low, medium, and high-mindful groups at the 33rd and 66th percentile. We compared these three groups' average posttest mindfulness scores and the change in mindfulness from pretest to posttest. Another bivariate analysis looked at the relation between children's internalizing and externalizing problems and their changes in mindfulness. Participants were divided into three groups based on how much their mindfulness scores changed from pretest to posttest: those whose mindfulness decreased (i.e. score change < 0), those whose mindfulness moderately increased (i.e. score change ranged 0–6), and those whose mindfulness substantially increased (i.e. score change > 6). In the multivariate inferential analysis, ordinary least

squares regression was performed to examine effects of changes in mindfulness scores on children's internalizing and externalizing problems, while controlling for all covariates.

Results

Sample Description

Table 1 shows the descriptive statistics of the sample. Among the 69 migrant children, 58% were boys, 42% were girls. The children's age ranged from 9 to 13 years, with the majority being 11 (62%) or 12 (32%). A total of 36% were born in Beijing, though they were still considered migrants due to their household registration status. Most children (88%) had been in the same migrant school since their first grade. The majority (96%) were living with both parents.

Bivariate Analyses

Table 2 shows the participants' levels of mindfulness before and after the intervention. Comparing pretest ($M = 69.23$, on a 15–90 scale, $SD = 12.71$) with posttest ($M = 71.73$, $SD = 11.28$), participants' average level of mindfulness significantly increased by 2.5 points ($p < .05$). Low-mindfulness children in pretest showed the highest improvement of mindfulness from the intervention. On average, children with low mindfulness gained 9.1 points mindfulness after the intervention, from 54.91 ($SD = 11.35$) to 64 points ($SD = 12.18$). This difference was strongly statistically significant ($t = 4.61$, $p < .001$). Those with medium mindfulness also showed a 1.3 points increase (from 72.3 to 73.6), though the difference was not statistically significant ($t = .63$, $p = n.s.$). Children with high mindfulness, however, showed 2.9 points decrease after the intervention. Their average mindfulness score changed from 80.5 ($SD = 2.7$) to 77.6 ($SD = 7.1$); this difference, however, was marginally significant ($t = -1.76$, $p < .1$).

Interestingly, the standard deviations for each group increased after the

intervention. Respectively, they changed from 11.4 to 12.2 for the low-mindfulness group, 2.6 to 9.6 for the medium group, and 2.7 to 7.1 for the high group. The increased variances within groups suggest that the intervention may work differently for individual children and call for further investigation.

Table 3 shows the bivariate analyses of changes in internalizing and externalizing problems by changes in mindfulness. Overall, changes in mindfulness during the intervention were significantly, negatively associated with changes in sampled children's total problem ($F(2, 66) = 11.5$, $p < .001$), internalizing problems ($F(2, 66) = 8.1$, $p < .001$), and externalizing problems ($F(2, 66) = 9.8$, $p < .001$). For those whose mindfulness substantially increased (i.e. more than 6 points), their internalizing problems decreased by 2.8 points and externalizing problems decreased by 3.1 points. For those whose mindfulness moderately increased (i.e. up to 6 points difference before and after intervention), their internalizing problems slightly increased by 0.2 point while externalizing problems decreased by 0.9 point. For children whose mindfulness decreased, their internalizing problems increased by 2.7 points (on a 0–24 scale) and their externalizing problems increased by 0.5 point (on a 0–18 scale). Their average SDQ score, totaling internalizing and externalizing problems, increased 3.3 points (on a 0–42 scale).

Multivariate Analysis

Table 4 presents the regression estimates of changes in mindfulness on child internalizing and externalizing problems. Through the intervention, increased mindfulness significantly reduced both internalizing ($\beta = -0.2$, $p < .001$) and externalizing problems ($\beta = -0.13$, $p < .001$) of the participants. Every one point increase in mindfulness was associated with 0.35 point lower SDQ scores, 0.2 point decrease in internaliz-

ing problems, and 0.13 point decrease in externalizing problems, while controlling for all covariates.

Discussion

The results suggest that the mindfulness intervention significantly improved levels of mindfulness of our sampled migrant children. The intervention showed stronger effects for children with low mindfulness at baseline. Those who were already highly mindful before the intervention, however, did not show much increase in mindfulness. In line with studies in western context (Bogels et al., 2008; Semple et al., 2010), our results show that mindfulness practice may reduce children's internalizing and externalizing problems. In particular, our study shows that mindfulness training has greater impact on reducing internalizing problems and for children whose mindfulness substantially increased through the training.

Mindfulness, though increasingly applied in western countries, had not been introduced to Chinese migrant children prior to this exploratory study. This study suggests that this approach may be applied in the Chinese context as well. Focusing on inner awareness and self-reflection, mindfulness could enhance Chinese migrant children's resilience within their adverse environment. While the external environment imposes risks on migrant children's emotions and behaviors, high levels of mindfulness may help them cope with these risks.

While schools in the U.S. and Canada have already begun to use mindfulness interventions to improve students' emotional management and school behaviors (Black & Fernando, 2014; Schonert-Reichl & Lawlor, 2010), our findings suggest that migrant schools in China could also use mindfulness practice to improve students' developmental outcomes. Researchers should collaborate with migrant

schools to design and deliver mindfulness interventions based on available school resources (e.g. time and staff availability) and student needs (e.g. emotional and behavioral).

Given that migrant schools usually have limited resources, facilitators should be aware of the amount of time an intervention may take away from overloaded teachers' schedules and the equipment available on-site. On the one hand, facilitators may collaborate with local social work agencies to deliver the training. This will not only compensate for migrant schools' manpower, it will also bring diverse cultural perspectives to the facilitator team. On the other hand, facilitators can also encourage school teachers to practice mindfulness with students in their daily teaching, which may enhance student well-being while fostering teachers' supportive relationships with students (Meiklejohn et al., 2012).

The resilience theory, however, also suggests that resilience is an ordinary adaptation process when given resources (Rutter, 1987; Rutter, 2012). Individuals are more likely to show resilience when the environment provides them with meaningful resources (Shean, 2015; Ungar, 2013). Therefore, to strengthen migrant children's resilience, the central and local governments must allocate more resources to improve migrant children's environment. This may involve increasing the access and quality of education for migrant children in urban areas, providing financial support to low-income migrant families, and offering social services to address migrant children's emotional and behavioral challenges.

The findings also provide implications for further research. For instance, the effects of intervention vary between children in low-mindful and high-mindful groups. One explanation might be that the intervention exposes low-mindful children to the new concept of mindfulness, which they begin

to be aware of and practice. Thus, experiencing the intervention itself, in addition to the actual mindfulness training, increases their level of mindfulness. In contrast, the high-mindful children (whose average pretest mindfulness score was 80.5 on a 15–90 scale) might be already aware of or practicing mindfulness subconsciously to certain extent. These children might also have less internalizing and externalizing problems overall. Therefore, they have less space to grow mindfulness or reduce problems.

Despite these assumptions, how and why mindfulness intervention works differently for each child warrant further exploration. Since risk and protective factors affect people in different ways, individuals' responses to adversity vary by their adaptation process (Rutter, 2012). Our next step will be follow-up interviews with the intervention participants. Several subjects will be drawn from the low-mindful, medium-mindful, and high-mindful groups. We will also follow up several extreme cases whose mindfulness scores substantially dropped after the training. Using a qualitative approach, we will further explore what the intervention meant for these students, and how the intervention worked or not worked for them. More important, the positive outcomes shown in our study warrant longitudinal experimental research to further examine the effectiveness of mindfulness intervention in Chinese migrant schools. Future research should use randomized experiments and repeated outcome measures to test the effects of mindfulness practice.

There are several limitations to this study. First, our participants are from migrant families; a total of 93 students participated in pretest, and 22 of them left Beijing before posttest. This high attrition rate might limit the external validity of these findings. Though the comparison between completed and

drop-out samples did not show significant differences in levels of mindfulness, internalizing problems, and externalizing problems, frequently-migrating children may be more vulnerable than other migrant children. Thus, future investigations could collect information on subjects' frequency of migration and analyze how migration frequency affects their emotional and behavioral outcomes.

Second, our study was conducted at one migrant school in Beijing only. Future research can include larger sample size at multiple sites to increase the generalizability to the Chinese migrant child population. Third, we used a single-group design in one migrant school to test the intervention effect. Though this design is useful in exploratory research, future studies should use longitudinal experimental designs to strengthen internal validity and causal inference. Despite the limitations above, this pilot study provides some pointers to apply the new concept of mindfulness in Chinese migrant schools.

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Table 1: Descriptive statistics of demographic variables

	Percentage
Gender	
Male	58.0
Female	42.0
Age	
≤10	2.9
11	62.3
12	31.9
≥13	2.9
Birth Place	
Beijing	36.2
Others	63.8
First School	
Yes	88.4
No	11.6
Family Type	
Two-Parent Family	95.6
Other	4.4

Note: N=69.

Table 2: Level of mindfulness by groups

	Pretest		Posttest		Change		T-Test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
All	69.23	12.71	71.73	11.28	2.51	10.15	2.05 *
Pretest Mindfulness							
Low	54.91	11.35	64.04	12.18	9.13	9.49	4.61 ***
Medium	72.30	2.62	73.56	9.64	1.26	9.49	0.63
High	80.47	2.71	77.61	7.10	-2.86	7.79	-1.76 +

Note: N=69.

Possible range of mindfulness: 15–90.

+ $p < .1$, * $p < .05$, *** $p < .001$.

Table 3: Change in internalizing and externalizing problems

	SDQ		Internalizing		Externalizing	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Mindfulness Change						
< 0	3.3	4.9	2.7	4.1	0.5	2.1
0–6	-0.5	5.9	0.2	4.2	-0.9	2.8
> 6	-5.8	8.0	-2.8	5.3	-3.1	3.3
All	-0.9	7.3	0.7	4.9	-1.1	3.1
F-Test	11.5 ***		8.1 ***		9.8***	

Note: N=69.

Possible ranges of SDQ: 0–42; internalizing problems: 0–24; externalizing problems: 0–18.

*** p < .001.

Table 4: Regression analysis of internalizing and externalizing problems

	SDQ			Internalizing			Externalizing		
	B	S.E.	P	B	S.E.	P	B	S.E.	P
Mindfulness Change	-0.35	0.08	***	-0.20	0.05	***	-0.13	0.04	***
Female	1.16	1.61		1.16	1.12		0.34	0.72	
Age	-1.48	1.36		-1.39	0.94		0.03	0.61	
Born in Beijing	-0.07	1.66		-0.72	1.15		0.51	0.74	
First School	-0.47	2.46		-0.60	1.70		0.07	1.10	
Family Type									
Two-Parent	---	---		---	---		---	---	
Other	1.76	3.89		2.62	2.69		-0.09	1.74	
Constant	3.29	3.80		4.04	2.63		-1.24	1.70	
R-square	0.29			0.27			0.21		

Note: N=69.

--- reference group. *** p < .001.

Appendix: The Analysis of Completed and Drop-out Cases

	Sex		Age Group		Beijing		First School		Family		Mindfulness		SDQ		N
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Complete	0.42	0.49	2.34	0.58	0.36	0.48	0.88	0.32	0.04	0.21	69.23	12.71	13.42	8.17	69
Drop	0.45	0.51	2.33	0.48	0.12	0.34	0.75	0.44	0.04	0.20	74.58	7.83	10.83	4.67	24
All	0.43	0.50	2.34	0.56	0.30	0.46	0.85	0.36	0.04	0.20	70.61	11.84	12.75	7.49	93
F-Test	0.1		0.0		4.9 *		2.5		0.0		3.7 +		2.2		

Cases

* p < .05.

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