Parent supervision attributes profile questionnaire (PSAPQ) for young children: psychometric properties of the Chinese version

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Abstract

Background: In China, thousands of children die from unintentional injury each year; the incidence rate of injury is from 19.4 to 64.3% and is the leading cause of mortality for children between the ages one and 14 [1]. Unintentional injury is a major cause of hospitalization and death for children in China and elsewhere; moreover, it is a heavy burden for society [2–4]. Most of the injuries are preventable since studies show that inadequate supervision is an important contributing factor to child injury [5–10]. Appropriate supervision could prevent children from attempting unsafe activities and assist them to accomplish tasks successfully [11]. When parents over-estimated their children’s coping skills for unsafe environments that often put the children in danger; on the contrary, if parents underestimated the coping skills, they could become more protective and obstruct their children’s development of essential skills for safety and autonomy [12]. It is difficult to obtain the data regarding parental supervision; to date, methods including naturalistic observation, self-report about supervision, and event participation monitoring methods were used, all of which are labor and time consuming [5–9, 13–18].

Methods: This is a two-phase study. In Phase I, the C-PSAPQ was produced by forward and backward translation. A total of 296 primary caregivers of 3–6 years old children were invited to participate in the second phase of the psychometric study. In order to assess the reliability of the C-PSAPQ, internal consistency and test-retest methods were performed. Additionally, construct validity was examined by using confirmatory factor analysis (CFA). The averaged variance extracted (AVE) and Bootstrap were used to test the convergent and to discriminate validity. The concurrent validity was assessed by evaluating the association between the self-reported C-PSAPQ and naturalistic observations.

Results: The Cronbach’s α and intraclass correlation coefficients were acceptable for the C-PSAPQ and four subscales. The CFA supported a 4-factor loading model; however, the convergent validity was not acceptable (AVE < .5 for two subscales). The concurrent validity was supported.

Conclusions: Due to the unacceptable convergent validity of the C-PSAPQ, an exploratory factor analysis is needed to ensure that the same trait is measured by its indicators in different cultures.

Keywords: Parent supervision, Parent supervision attributes profile questionnaire, Reliability, Validity, Children

Background

In China, thousands of children die from unintentional injury each year; the incidence rate of injury is from 19.4 to 64.3% and is the leading cause of mortality for children between the ages one and 14 [1]. Unintentional injury is a major cause of hospitalization and death for children in China and elsewhere; moreover, it is a heavy burden for society [2–4]. Most of the injuries are preventable since studies show that inadequate supervision is an important contributing factor to child injury [5–10]. Appropriate supervision could prevent children from attempting unsafe activities and assist them to accomplish tasks successfully [11]. When parents overestimated their children’s coping skills for unsafe environments that often put the children in danger; on the contrary, if parents underestimated the coping skills, they could become more protective and obstruct their children’s development of essential skills for safety and autonomy [12]. It is difficult to obtain the data regarding parental supervision; to date, methods including naturalistic observation, self-report about supervision, and event participation monitoring methods were used, all of which are labor and time consuming [5–9, 13–18].
Morrongiello [15, 16] developed the Parent Supervision Attributes Profile Questionnaire (PSAPQ) to assess parentalprotectiveness and supervision ofchildren from parental interaction with theobservational measures. The PSAPQ has 29items, including foursub-scales: protective-ness, supervision beliefs, toleranceformarchs risk taking, and belief in fate. Thepsychometric properties ofPSAPQ were tested by using192 parents who had children aged 2–5 years old[15]. The results showed that the subscales were re-presentative of four constructs by using confirmatoryfactor analysis, and the internal consistency(Cronbach’s α) was good for the subscales: protective-ness (α = .78),supervision beliefs (α = .77), tolerance for children’srisk taking (α = .79), and belief in fate (α = .78). Inaddition, the test-retest reliability for the foursub-scales were all acceptable (r = .72–.80, p < .001).Intercorrelations was significant between parents’ self-reportedPSAPQ and the naturalistic observation byresearchers. Further, convergent and discriminantvalidity were tested, and all indicated good constructvalidity. Correlations among the four subscales werewithin the acceptable range, for example, protective-ness and tolerance for children’s risk taking (r = – .37),protectiveness and belief in fate (r = – .13), and supervi-sion beliefs and belief in fate (r = – .21); the resultsshowed the factors were significantly distinct indifferent constructs. The PSAPQ has been widelyused to assess supervision and children’s risks ofunintentional injury in different studies with otherchildren’s age groups, and all showed good psychomo-metric properties [13–17].

In China, there is a specific type of family structurenot found elsewhere in the world, which is called left-behind children. In this type of family structure, theparents are away from their hometown for work whiletheir children stay in the hometown with grandparents.Prior studies revealed that single-parent children andleft-behind children’s families are more vulnera-ble than the two-parent families for unintentional injurybecause of a lack of supervision [19–21]. However,controversial findings pointed out that caregivers whospent more time taking care of their children couldn’tdecrease the unintentional injury; instead, the quality ofsupervision matters [20, 22]. Therefore, a properlyvalidated instrument to measure the supervision ofchildren among Chinese primary caregivers is import-ant and necessary. Currently, there is no availablemeasurement of parental supervision in Chinese lan-guage. Thus, the aims of this study were to translateand adapt the PSAPQ into Chinese (C-PSAPQ), andfurther to test the reliability, validity, and factor struc-ture of the C-PSAPQ in Chinese primary caregivers of3–6 years old children.

Methods
Study design
The ethics of this study was approved by Harbin MedicalUniversity. Two phases were conducted in the study.First, the original questionnaire was adapted and trans-lated into Chinese, and, second, was the psychometrictesting phase.

Phase 1: translation and adaption of the PSAPQ
In adapting the PSAPQ to this study, translation theoryand the recommended procedures for cross-culturalresearch were used to forward-translate the instrumentinto Chinese and then the Chinese version was back-translated into English using the criteria developed byFlaherty and colleagues to assure semantic, contextu-al, and technical equivalence of the original andtranslated versions [23–27]. The panel experts includedone Chinese American professor with bicultural back-grounds, two Chinese pediatric nursing teachers who werefamiliar with both English and Chinese, two collegeEnglish teachers, and one fifth-grade Chinese languageteacher.

A pretest was done with 10 stratified randomlyselected primary caregivers of young children (3 to 6years old), no further modification was needed. Theerrors in meaning were examined at the final reviewbetween the back-translated English version and the finalChinese version [24, 25].

Phase 2: testing phase
Participants and data collection The study participantswere recruited from four kindergartens (children aged 3to 6) in the city of Daqing, Hei Longjiang Province inChina. Data were collected from the school activitiesmeeting when the parents were together with theirchildren in the kindergarten from May 2017 to October2017. Only one primary caregiver from each family wasallowed in this study, and the inclusion criteria for theprimary caregiver were: (1) live with the participatingchild at least 50% of the time and be the main caretakerof the child, (2) able to read and write in Chinese. Exclusioncriteria included children with congenital medical problems and children with behavioral problems(e.g., autism, ADHD, schizophrenia), which was screenedby using the Child Behavior Rating Scale (CBRS) [28].Any children who scored 10 and above on the CBRSwere excluded, and a referral was made for furtherevaluation.

The written informed consent was obtained from eachstudy participant. The participants were instructed to fillout the questionnaire at home and return it to thekindergarten teacher. A total of 322 primary caregiversparticipated in the study, and 296 of them completed
the study (response rate was 92%). Among them, 50 primary caregivers were invited back, three weeks after, for the test-retest reliability study.

Measures

The family information and unintentional injury history form

The author (HZ) developed this form to collect the primary caregiver’s sociodemographic information and the child’s past year unintentional injury history, which derived from the International Classification of Disease (ICD-10) [29]. Unintentional injury was defined as an injury that (a) was diagnosed as a non-fatal injury by physicians and received medical treatment or (b) received emergency medical treatment or assistance from teachers, parents or others, and (c) required the child to rest for more than half a day before returning to normal activity [30]. The primary caregivers were asked to list the frequency of injury and to rate the severity of each injury.

The Chinese version of the parent supervision attributes profile questionnaire (C-PSAPQ)

The C-PSAPQ contains 29 items covering four dimensions: protectiveness with 9 items, supervision beliefs with 9 items, tolerance for children’s risk-taking with 8 items, and belief in fate with 3 items. Caregivers were asked to rate each item using a five-point Likert-type scale (1 = never to 5 = all of the time). A higher total scores indicated the primary caregivers had more engagement with supervision for their children.

The naturalistic observations

Morrongiello and House [16] used naturalistic observation to examine the relevance between parental attributes that measured from the PSAPQ and behaviors, a similar protocol of naturalistic observations was adopted in the current study. A Likert-type checklist with five dimensions was used in the naturalistic observations. The five dimensions are: visual supervision (3 = watching child continuously, 1 = not at all), auditory supervision (3 = able to hear the child continuously, 1 = not at all), physical proximity (5 = constant physical contact with child, 1 = beyond reach of the child), parent distraction (5 = parent is completely focused on child, 1 = all the parent’s time is spent on distraction activities), and parent engagement with child (4 = all the parent’s time was spent actively playing with child, 1 = completely uninvolved and inattentive to the child’s play) [16]. Collapsing scores provided a total supervision score for each behavior. Higher scores indicate parents pay more attention to the children in the specific setting.

In the pilot study, ten parent-child dyads were individually involved in a 10-min naturalistic observation on the kindergarten playground, and the parents subsequently completed the self-report C-PSAPQ, and the naturalistic observation checklist [15]. While the parent-child dyads in the playground, the first author (HZ) and a trained kindergarten teacher, were simultaneously using the observation checklist to evaluate parental supervision. The inter-rater reliability was established before they conducted the field observation. The two observers simultaneously stayed close by each of the parent-child dyad participants in the playground and naturally observed them. After the 10-min observation, the two observers compared their assessments with each other to reach an agreement, then collapsed the agreed scores for the supervision scores. The scores of the total naturalistic observation and its five dimensions from the researchers then compared with the parental self-reported scores, which showed highly correlated with each other (r = .75–.92, p < .001).

Statistical analysis

Statistical analysis was performed by SPSS 18.0 and AMOS 20.0. Descriptive statistics were used for analyzing the demographic characteristics. Mean and standard deviation were used to analysis the interval and ratio data, such as age, severity of injury; frequency statistics were used to examine nominal data such as sex, marital status, and education. Psychometric properties of the C-PSAPQ were measured by the following statistical analyses.

Reliability

The reliability of the C-PSAPQ was assessed by the internal consistency and test-retest reliability. Intra-class correlation coefficients (ICC) were applied to assess the test-retest reliability, and the split in half reliability was also tested. The values for Cronbach’s alpha coefficient and ICC equal to .60 or higher were considered acceptable [14, 31].

Validity

Construct and concurrent validity were measured. Confirmatory factor analysis (CFA) was used to measure the construct validity and to determine if the factors in the original study were supported in the current Chinese population. For the CFA, model fit was evaluated by using multiple fit indices including the ratio Chi-square and degrees of freedom ($\chi^2/df$), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) and Root Mean Square Error of Approximation (RMSEA). The $\chi^2/df < .3$, GFI > .9, AGFI > .9, and RMSEA < .08 were accepted [32]. Based on the corrected correlations from the CFA model, the averaged variance extracted (AVE) and the Bootstrap ML were used to test the convergent and discriminate validity [33].
Concurrent validity was evaluated by the correlation between the supervision score from naturalistic observation and the scores from PSAPQ and its subscales. In our pilot study, the supervision scores were significantly correlated between researcher’s and parental naturalistic observation. A decision, based on feasibility, was made to only include parental self-report supervision scores in the concurrent validity test. In addition, a standardized written scenario of child’s activity in playground instead of a real field observation for parents was provided for the naturalistic observation assessment.

Results
A total of 296 caregiver-child dyads (Table 1) participated in this study, with a mean age of 59.1 (SD = 5.4) for caregivers and 5.3 (SD = 1.4) for children (163 boys and 133 girls). The majority of the study participants came from nuclear families (62.8%), with an average annual income of 50,000 yuan (55.7%) which is above the national average in China. More than half of the caregivers were college educated (65.5%), and were grandparents (63.9%). The frequency of injury in the past year was 113 (38.2%) never had any injury, 38 (12.8%) had one, 40 (13.5%) had twice, and 105 (35.5%) had more than three times. The average of severity of injury was 1.3 (SD = 0.8, ranged from 0 to 10).

The total score for the C-PSAPQ was 101.36 (SD = 13.77); for the four subscales were: 34.30 + 5.02 (protectiveness), 33.71 + 5.56 (supervision beliefs), 28.42 + 5.61 (tolerance for children’s risk taking), and 4.96 + 2.25 (belief in fate). Compared to the findings from Petrass’ study [13], the family caregivers in the current study scored significantly higher in protectiveness (M = 19.3; t = 51.38, p < .01), supervision beliefs (M = 18.3; t = 47.67, p < .01), and tolerance for children’s risk taking (M = 22; t = 19.67, p < .01). However, the mean score of belief in fate was significantly lower than Petrass’ results (M = 13.1; t = -62.16, p < .01).

Reliability
The Cronbach’s α for the C-PSAPQ was .84 and ranged from .61 to .78 for its subscales. In the test-retest analysis, the ICCs from the 50 parents were .92 for the C-PSAPQ and ranged from .82 to .87 for the subscales (Table 2). The split in half reliability of C-PSAPQ was .80.

Validity
Construct validity
The CFA (χ²/df =1.14, CFI = .95, GFI = .95, RMSEA = .02, P = .002) confirmed.

the same four factors addressed by Morrongiello [34]. The diagram and values of the adjusted model were shown in Fig. 1 and Table 3.

Table 1 Characteristics of children and the primary caregiver

| Characteristic (n = 296) | Value |
|-------------------------|-------|
| Child mean age (SD)     | 5.3 (1.7) |
| Child sex, n (%)        |       |
| Boy                     | 163 (55.1) |
| Girl                    | 133 (44.9) |
| Primary caregiver for child, n (%) |
| Parent(s)               | 106 (35.8) |
| Grandparent(s)          | 189 (63.9) |
| Babysitter and others   | 1 (0.3)   |
| Primary caregiver mean age (SD) | 59.1 (5.4) |
| Marital status of primary caregiver, n (%) |
| Married                 | 292 (98.6) |
| Divorced/Single         | 4 (1.4)   |
| Education, n (%)        |       |
| Illiteracy              | 1 (0.3)   |
| Under Junior High School| 44 (14.9) |
| Senior High School      | 57 (19.3) |
| Above College           | 194 (65.5) |
| Employment status, n (%)|
| Employed                | 92 (31.1) |
| Unemployed              | 20 (6.8)  |
| Retirement              | 184(62.1) |
| Family Type, n (%)      |       |
| Nuclear family          | 186 (62.8) |
| Remarried family        | 6 (2.0)   |
| Single-parent family    | 3 (1.0)   |
| Extended family         | 101 (34.1) |
| Household income (per person per month in yuan), n (%) |
| < 1000                  | 3 (1.0)   |
| 1000–2000               | 11 (3.7)  |
| 2000–3000               | 35 (11.8) |
| 3000–4000               | 82 (27.7) |
| > 4000                  | 165 (55.7) |
| Religious faith, n (%)  |       |
| Yes                     | 9(3)      |
| No                      | 287(97)   |
| Frequency of injury (per year) |
| None                    | 113(38.2) |
| Once                    | 38(12.8)  |
| Twice                   | 40(13.5)  |
| More than three times   | 105(35.5) |
| Severity of injury (SD) | 1.3(0.8)  |
Convergent-discriminate validity

Convergent validity was examined by average variance extracted (AVE) and composite reliability (CR). AVE measures the level of variance captured by a construct versus the level due to measurement error; a level of 0.5 and above is acceptable. CR could provide less biased estimates of reliability, and a value of 0.7 and above is acceptable [35]. The results of convergent validity (Table 4) revealed that two subscales, protectiveness and belief in fate, had unacceptable AVE and CR. The Bootstrap ML [36] was used to test discriminate validity, and the results were presented in Table 5. The confidence interval (CI) of paired correlation of two subscales (supervision beliefs and protectiveness) contains 1.0 (.88 to 1.06) which indicated that the two subscales could not discriminate with each other when the paired correlations of other subscales were below 1.0.

Concurrent validity

To assess the concurrent validity of the C-PSAPQ, the correlations between the parental self-report naturalistic observations and the scores of the C-PSAPQ and its subscales were assessed. There were statistically significant associations between the naturalistic observation and C-PSAPQ whole scale (r = .170, p < .01) and its two subscales, protectiveness (r = .205, p < .01) and supervision beliefs (r = .246, p < .01). No significant association was found with the other two subscales, tolerance for children’s risk taking and belief in fate. The results were similar to those from pilot study that the total score of naturalistic observation had low correlation with total score of C-PSAPQ and its subscales (rs = −.34−.49, p > .05), with an exception in supervision beliefs (rs = .849, p < .001).

Discussion

The purpose of this study was to adapt the C-PSAPQ and assess the psychometric properties of this scale among the Chinese population. Findings from this study show that the C-PSAPQ is linguistically relevant to Chinese family caregivers for young children. As we translated the questionnaire across culture, no item had great modification to the Chinese cultural content. The C-PSAPQ may covers protectiveness, supervision beliefs, tolerance for children’s risk taking, and belief in fate.

The C-PSAPQ had acceptable internal consistency reliability, all above .80, which is in accordance with previous studies of this scale [11, 14]. The Cronbach’s α for the two subscales, supervision beliefs (α = .64) and belief in fate (α = .61), was less than previous reports (Supervision = .77, Fate = .78), but was still acceptable [25]. This might be related to the differences between Eastern and Western parents in differing socioeconomic, cultural, and religious factors, which affect the perception of the ability to care for children and attendant dangers. Recently, a few published studies suggest cultural differences may contribute to race differences in injury of the children [26, 28, 37]. The western culture encourages child risk-taking, adventures and impulsion. Many caregivers in the Western families expressed self-
Table 3 Parcel structure by item between original version and Chinese version of PSAPQ

| Factor | Parcel | Factor Scores | Original V | Chinese V |
|--------|--------|---------------|------------|-----------|
| Protectiveness | Parcel 1 | 0.75 | 0.60 |
| | I feel very protective of my child |
| | I think of all the dangerous things that could happen |
| | I keep my child from playing rough games or doing things where he/she might get hurt |
| | Parcel 2 | 0.71 | 0.51 |
| | I make him/her keep away from anything that could be dangerous |
| | I feel fearful that something might happen to my child |
| | I warn him/her about things that could be dangerous |
| | Parcel 3 | 0.67 | 0.71 |
| | I keep an eye on my child’s face to see how he/she is doing |
| | I feel a strong sense of responsibility |
| | I try things with my child before leaving him/her to do them on his/her own |
| Supervision | Parcel 1 | 0.83 | 0.66 |
| | I have my child within arm’s reach at all times |
| | I know exactly what my child is doing |
| | I can trust my child to play by himself/herself without constant supervision |
| | Parcel 2 | 0.84 | 0.78 |
| | I stay within reach of my child when he/she is playing on the equipment |
| | I keep a close watch on my child |
| | I say to myself that I can trust him/her to play safely |
| | Parcel 3 | 0.64 | 0.68 |
| | I stay close enough to my child that I can get to him/her quickly |
| | I hover next to my child |
| | I make sure I know where my child is and what he/she is doing |
| Risk tolerance | Parcel 1 | 0.70 | 0.73 |
| | I encourage my child to try new things |
| | I let him/her learn from his/her own mishaps |
| | Parcel 2 | 0.87 | 0.74 |
| | I let my child take some chances in what he/she does |
| | I let my child do things for him/herself |
| | I let my child experience minor mishaps if what he is doing is lots of fun |
| | Parcel 3 | 0.74 | 0.83 |
| | I let my child make decisions for himself/herself |
| | I encourage my child to take risks if it means having fun during play |
| | I wait to see if he/she can do things on his/her own before I get involved |
| Fate | Item | Original V | Chinese V |
| 11 | When my child gets injured it is due to bad luck | 0.61 | 0.80 |
| 3 | Whether or not my child gets injured is largely a matter of fate | 0.71 | 0.62 |
| 28 | Good fortune plays a big part in determining whether or not my child gets injured | 0.92 | 0.40 |
confidence in supervision and a belief that the safety of the children is a matter of luck or fate [6, 14, 37]. Some parents also believe that childhood injuries are normal and that they do not have the ability to prevent their children from injury, so they might pay less attention than parents who had higher self-confidence in controlling for injuries [38, 39]. However, the caregivers in Latin American and Asian families do not encourage their children’s risk-taking behaviors in order to protect them from unintentional injury [40, 41]. In China, it is quite easy for Chinese parents to blame themselves if the child has an injury because most Chinese parents have no religious faith; they believe that if the injuries happen they result from the parents’ negligent care for the children [42]. In the current study, almost all primary caregivers (97%) had no religious faith; most of them think they are masters of themselves instead of victims of destiny. Various researches showed parental education related to pediatric injury: the degree of supervision varied across different educational levels. Those caregivers with high educational levels accurately supervised to assess the risk level and to cope with the risk [13, 14, 41]. In the current study, there are 194 (65.5%) caregivers with at least college level education, and the mean score of belief in fate was 4.96 which was lower than Petrass’ results [13]. This indicated that most caregivers had the confidence to supervise and keep their children safe. On the contrary, the scores of protectiveness, supervision beliefs and tolerance for children’s risk taking in this study are higher than Petrass’ study [13]. The results show that caregivers were inclined to pay more attention to children in order to avoid injuries. Although the mean score and the range for the extended version of the PSAPQ have been reported [13, 15, 34], to date, normative scores for the PSAPQ have not been published. The norms and cut-off scores for the PSAPQ should be further explored to identify children who had higher risk of injury as a result of lack of parental supervision. Multiple methods were used in this study to assess the validity of the C-PSAPQ. The results from the CFA indicate that this instrument includes four dimensions just as Morrongiello originally proposed [34]; however, the loading to each factor was different when compared to the original version (Table 3). Although CFA confirmed the C-PSAPQ included the same four factors as Petrass’ study [13], the two subscales, protectiveness and supervision beliefs, are highly correlated with each other, which was also established in a study in Portuguese [14]. Since the exploratory factor analysis (EFA) was not performed in this study, further study should include EFA since the constructs might be comprehended differently in different cultures. Regarding the concurrent validity, although the C-PSAPQ scores were significantly correlated with the naturalistic observations, the correlation was relatively low, which indicates concurrent validity should be further explored.

To our best knowledge, this is the first study to test the psychometric evaluation of the C-PSAPQ in Chinese. Although we found sound psychometric properties, some limitations need to be considered. First, the purpose of this study was to test the psychometric properties of the C-PSAPQ; however, the convergent/discriminant validity in the constructs of supervision beliefs and protectiveness were ambiguous in this study. Therefore, further validation is needed, particularly, the study participants were from four kindergartens in the city of Daqing; thus, the findings might not be presented to other areas of China. It is necessary to increase a large sample size in a future study and to employ

### Table 4 The convergent validity of the PSAPQ

| Regression | SE  | t   | Standardized | CR  | AVE |
|------------|-----|-----|--------------|-----|-----|
| V1 parcel1 ← F1 | 0.60 | 0.64 | 0.38         |
| V1 parcel1 ← F1 | 0.11 | 7.25*| 0.51         |
| V1 parcel1 ← F1 | 0.12 | 8.79*| 0.72         |
| V2 parcel1 ← F2 | 0.66 | 0.75 | 0.50         |
| V2 parcel2 ← F2 | 0.11 | 10.91*| 0.78       |
| V2 parcel3 ← F2 | 0.11 | 9.52*| 0.68         |
| V3 parcel1 ← F3 | 0.73 | 0.81 | 0.59         |
| V3 parcel2 ← F3 | 0.08 | 11.43*| 0.74       |
| V3 parcel3 ← F3 | 0.10 | 11.76*| 0.83       |
| P1 ← F4 | 0.80 | 0.65 | 0.40         |
| P3 ← F4 | 0.18 | 4.77*| 0.62         |
| P2 ← F4 | 0.13 | 4.45*| 0.40         |

Note: * means $p < 0.001$. V1 = Protectiveness, V2 = Supervision beliefs, V3 = Risk tolerance, V4 = Fate believes

### Table 5 Correlation matrix of factors in PSAPQ

- **Protectiveness**
  - 1
- **Supervision beliefs**
  - 0.97** (0.88, 1.06)
  - 1
- **Risk tolerance**
  - 0.64** (0.51, 0.76)
  - 0.74** (0.64, 0.82)
  - 1
- **Fate believes**
  - –0.14 (–0.33, 0.05)
  - –0.05 (–0.26, 0.11)
  - 0.02 (–0.19, 0.19)

Note: Show only diagonal and lower left half correlations matrix; 95% confidence interval in parentheses; ** $p < 0.01$
psychometric test of the C-PSAPQ in both urban and rural areas. Second, the majority of the caregivers’ educational levels in the present study was above college (65.5%) and most of the primary caregivers are grandparents (63.9%). The different types of supervision between grandparents and parents should be further assessed since the parenting style could be different between generations. In urban China, the three-generation family is very common; children are cared for by both their parents and grandparents who all pay much attention to the children in order to avoid injuries [43]. In contrast, the left-behind children were solely cared for by the grandparents; therefore, the injury prevalence rate might be different across the types of family structures and warrant further study. Third, although the concurrent validity had a statistical significance, the correlation was low in this large sample size, which either indicated the self-report questionnaire could not replace the observation method to predict unintentional injuries or it is problematic when comparing the association of the assessments between parents and the researchers. Fourthly, the participants of this study were all physically and mentally healthy children, and behavioral problems were excluded; the study could not provide a full explanation regarding parental supervision of children who would need additional attention. Further study should examine the characteristics of parental supervision and behaviors in the group of children with ADHD.

Conclusion
Parental supervision is important for preventing child injury, but, to date, there is no reliable questionnaire to measure parental supervision in China. This study has shown that the C-PSAPQ has acceptable reliability, construct validity, concurrent validity, but not convergent/discriminant validity. Due to the unacceptable convergent/discriminant validity (supervision beliefs and protective) of the C-PSAPQ, an exploratory factor analysis is needed to ensure that the same trait is measured by its indicators in different cultures in a further study.

Abbreviations
AGFI: Adjusted Goodness of Fit Index; AVE: averaged variance extracted; CFA: Confirmatory factor analysis; CFI: Comparative fit index; CI: Confidence interval; CVI: Content validity index; GFI: Goodness of fit index; ICC: Intraclass correlation coefficient; PSAPQ: Parent Supervision Attributes Profile Questionnaire; RMSEA: Root mean square error of approximation

Acknowledgments
We would like to thank all participants for their contributions to this study. The authors are also thankful for the help receive from Da Wei, Mo Li, JY Zhang, XX Zhang and teachers of kindergartens.

Authors’ contributions
HZ designed the study and wrote the first draft of the manuscript, JY screened the inclusion criteria of children, analyzed the data and wrote the part of statistical analysis. SY contributed to the study design. YX and YK collected the data. HL revised the manuscript for grammars. All authors have read and approved the final version of the manuscript.

Funding
This study was funded by National Natural Science Foundation of China (NSFC, NO.71603064) and was also supported by the Ministry of Education in China (NO. 17YJAZH014).

Availability of data and materials
The datasets used and/or analyzed during this study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate
This study procedure was approved by the Ethics Committee of Harbin Medical University. All participants provided written informed consent. The questionnaire was treated as confidential and anonymous.

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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Received: 4 November 2018 Accepted: 24 July 2019
Published online: 02 September 2019

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