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Enhancing Child Sexual Abuse Prevention Knowledge With an Educational Toolkit -Evaluation of the Chinese Doll Program

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Objective: In countries with conservative attitudes towards sex and limited resources to prevent child sexual abuse, culturally adapted CSA prevention programs are essential. This study outlines a randomized controlled trial evaluating the effectiveness of the Doll program for preventing CSA in the specific context of China.

Method: 181 children were pre-tested and post-tested (5 weeks later) for knowledge of sexual abuse prevention. Children were assigned to one of three groups; 1) child only (n = 60); 2) child and parent (n = 60); and 3) control (n = 61).

Results: Children in groups 1 and 2 showed significant increases ($p < 0.001$) in scores on the Appropriate Touch Scale (ATS) and the Inappropriate Touch Scale (ITS), whereas those in the control group did not show a significant increase in ATS scores, but their scores on ITS significantly increased ($p < 0.001$). Children in group 2 showed significantly increased ITS scores compared to group 1 ($p = 0.016$).

Conclusion: Doll program effectively enhances children's CSA prevention knowledge, with parental engagement demonstrating a positive impact on the program.

Keywords: child sexual abuse, CKAQ-RIII, intervention, evaluation, prevention

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INTRODUCTION

CSA Prevalence and Prevention in China

Despite the rights of children to be safeguarded against all forms of violence, including sexual abuse, Child sexual abuse (CSA) remains a grave public health issue affecting children across diverse cultures and societies, with severe negative consequences for victims, their families, the social environment, and society as a whole [1–4]. Cultural norms related to parenting, discipline, family dynamics, and sexuality may influence the prevalence, forms, definitions, characteristics, and impact of child sexual abuse in different regions [5, 6].

China, being a hierarchical society with strong Confucian ideology, exhibits certain cultural aspects that may contribute to child sexual abuse [7]. For instance, the moral code of filial piety expects children to unquestioningly obey their parents, even if they are subjected to scolding or physical punishment, which is viewed as an expression of care [6]. The traditional Chinese cultural suppression of sexual topics makes it challenging for Chinese children to discuss sexuality and express experiences of sexual victimization [8]. Moreover, Chinese families often

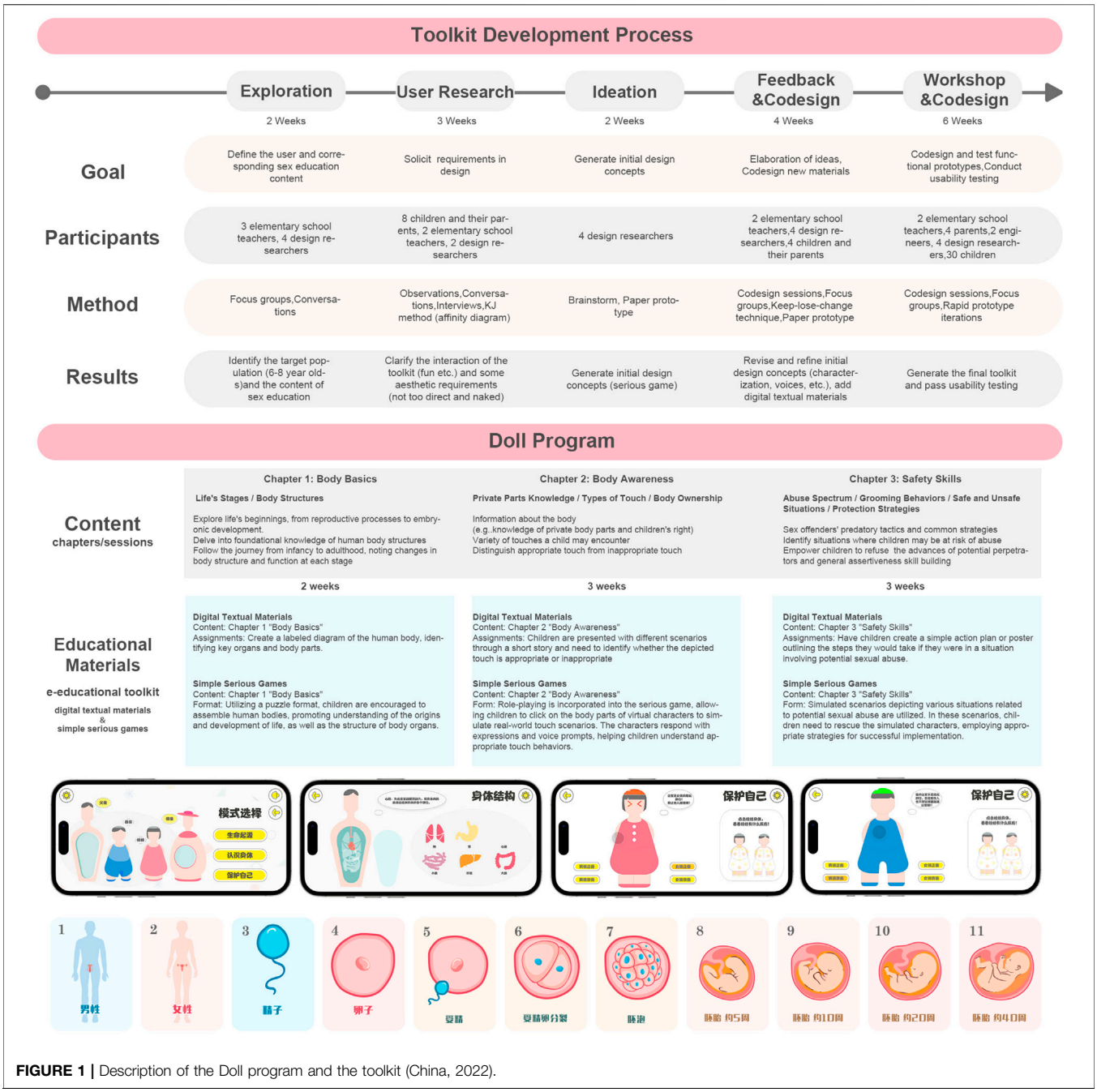

FIGURE 1 | Description of the Doll program and the toolkit (China, 2022).

discourage CSA victims from disclosing their experiences to avoid bringing shame to the family [6].

With the rise of Internet technology, child sexual abuse is gaining more visibility in China. Shifts social values have led to increased awareness of "child abuse," with the Chinese term "Nue Tong" being used to define child victimization [7]. Although several studies have shown the benefits of formal, systematic, and repeated training through school-based CSA prevention programs [9–17], these school-based CSA prevention programs, which incorporate educational materials such as courses and dramatic performances may not be fully applicable in China because of the lack of systematic education faculty [18], and their preparation and implementation may be impractical due to time and resource constraints in schools [19, 20]. Particularly during the COVID-19 pandemic, school-based interventions became unfeasible, emphasizing the importance of remote digital interventions as promising solutions for addressing resource limitations and expanding reach [21–23]. Additionally, discussing sexuality in public remains sensitive in China, making it challenging to implement abstract CSA prevention concepts that young children may struggle to comprehend. Moreover, a variety of digital resources for child sexual abuse (CSA) prevention

education have been created to enhance program suitability for different age groups, increase engagement, and improve accessibility [16], [24–29].

Description of the Doll Program

The Doll program is based on the aforementioned context of sexuality education in China and is specifically tailored for lower elementary school students. The Doll program is designed to address the challenges of limited educational resources, particularly the absence of sex education curricula in schools and the broader family environment. Therefore, the e-educational toolkit consisting of digital textual materials and engaging simple serious games as educational materials was developed for Doll program. While in the e-education toolkit, we use a lot of doll images to represent a lot of different characters in real life, such as strangers, doctors, parents, etc., so the name of the program is Doll.

The content of CSA prevention in the Doll program is anchored in UNESCO's 2018 International Guidelines for Sexuality Education (Revised) [30] and Chinese textbooks dedicated to elementary school children's sexuality education—specifically, the 12-volume Cherishing Life series edited by Wenli Liu [31, 32]. Illustrated in **Figure 1**, the content is organized into three main chapters: body basics, body awareness, and safety skills.

The content of the e-educational toolkit aligns with the three aforementioned chapters. The development the toolkit (**Figure 1**) employed a co-design approach [33–36], involving various stakeholders, including parents, teachers, designers, and engineers. The e-text materials in the toolkit comprehensively cover the knowledge to be acquired in each chapter, accompanied by corresponding assignments. The toolkit's games aim to enhance children's understanding of abstract concepts through images, thereby fostering interest in learning. These games take the form of jigsaw puzzles, role-playing, and simulation situations. Given its specific design for Chinese children in the early elementary grades, the toolkit currently supports Chinese characters and Pinyin languages.

In our quest to assess the efficacy of the Doll program, we delve into the fundamental question: Does students' knowledge of sexual abuse prevention experience a meaningful shift from pre to post-test? Drawing from a wealth of previous research highlighting the positive impact of parental involvement in CSA prevention programs [11], [37–39], we extended an invitation to children's parents to actively participate in the evaluation. Thus, we have formulated the following hypotheses:

Hypothesis 1: Active participation in the Doll program will result in a significant improvement in students' understanding of child sexual abuse compared to their counterparts who did not partake in the program.

Hypothesis 2: Within the Doll program participants, we anticipate that the child and parent group will demonstrate a notably more pronounced enhancement in child sexual abuse knowledge compared to the child-only group.

METHODS

Participants

In the initial phase, we assessed the eligibility of 260 children with a Chinese cultural background from a prominent public elementary school in Beijing, China. Insights into their physical and cognitive status were gathered through information provided by their class teachers. Inclusion criteria required that children could understand and use the toolkit normally. However, five children exhibiting severe motor impairments, such as broken bones and an inability to write at the time of assessment, were excluded from the Doll program. Consent was obtained from both the children and their caregivers through the signing of an informed consent form. Unfortunately, 74 caregivers did not agree to participate, leading to the subsequent exclusion of 79 children. Ultimately, 181 children actively participated in the Doll evaluation. Among the participants, 49.2% were females ($N = 89$), and 50.8% were males ($N = 92$). The participants had an average age of 6.12, with a standard deviation of 0.78.

Measures

The Children's Knowledge of Abuse Questionnaire (CKAQ-RIII), developed by researchers based on previous studies, was utilized in this study to assess sexual abuse prevention knowledge among children [40–43]. The CKAQ-RIII comprises 33 items, with 9 items constituting the Appropriate Touch Scale (ATS) and 24 items forming the Inappropriate Touch Scale (ITS). ATS addresses concepts like appropriate touch, such as a doctor needing to examine private parts or seeking help from an unfamiliar security guard. ITS focuses on encompassing different touch types and encouraging children to communicate discomfort. The reliability of ITS and ATS within the CKAQ-RIII scale has been demonstrated in studies using either partial or full versions, including non-English speaking samples [16, 17, 41], [44–49]. This substantiates the CKAQ-RIII as a robust tool for evaluating children's knowledge of sexual abuse prevention, supporting its application in both research and practical contexts.

The Chinese version of CKAQ-RIII has been utilized in previous studies [11, 50]. In the Chinese version of the questionnaire, "True," "False," or "I don't know" was replaced with "Agree," "Disagree," and "Don't know" as response options. A score of 1 was assigned to correct responses, whereas incorrect, "Don't know," or blank answers received a score of 0. In our study, the ITS (24 items) demonstrated strong internal consistency ($\alpha = 0.791$), while the ATS (9 items) exhibited slightly lower reliability ($\alpha = 0.712$). This level of reliability is considered acceptable and aligns with findings in other studies [11, 46, 50].

Procedure

We obtained parental consent for all participating children, and the study protocol was approved by the ethical Institutional Review Board (IRB) at Beijing Institute of Technology.

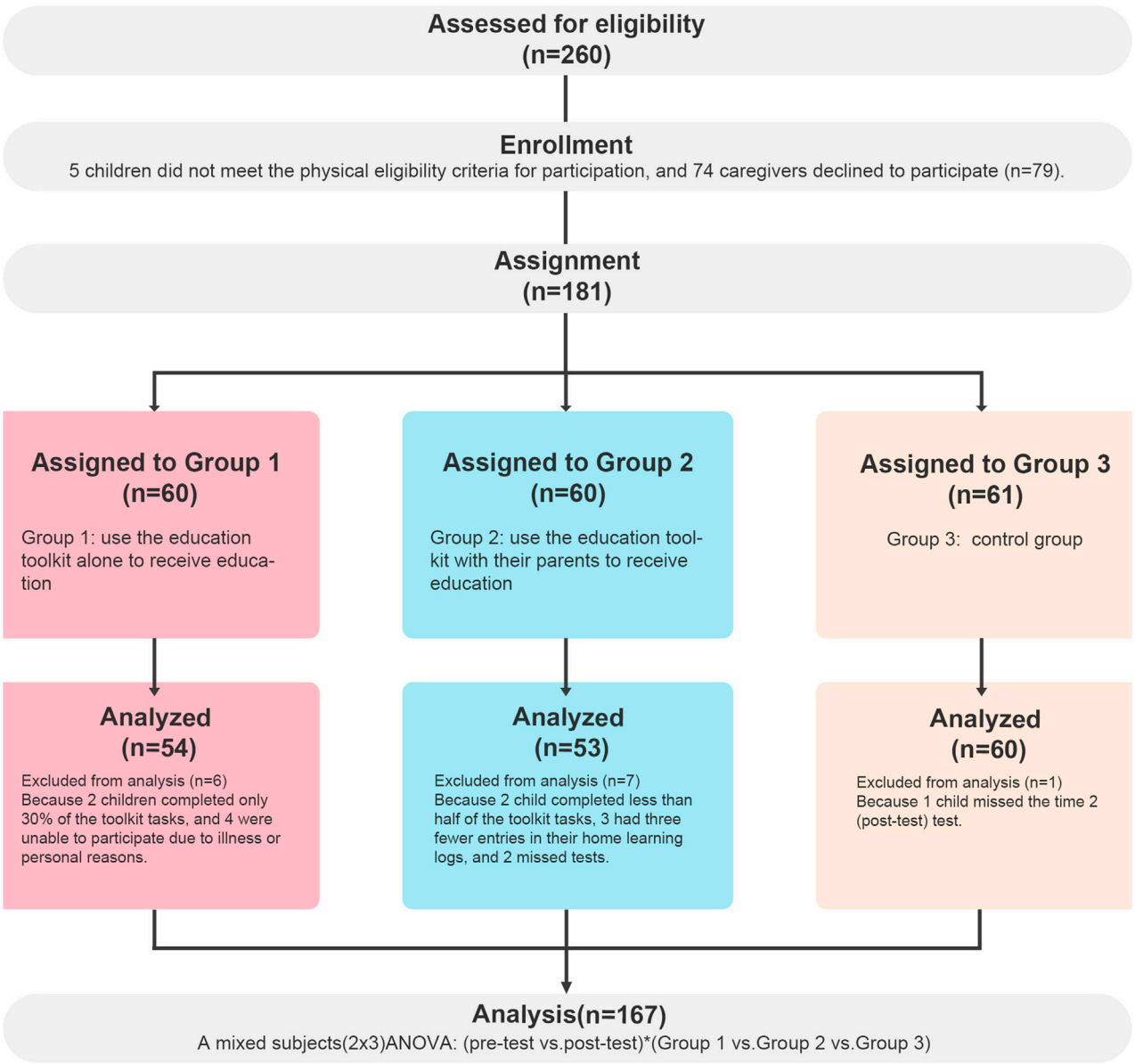

FIGURE 2 | Sampling procedure of the study participants (China, 2022).

A total of 181 children from 5 classes participated in the program and were randomly assigned to groups 1, 2, or 3. Group 3 served as the control group and did not participate in the Doll program (control group, $n = 61$). Group 1 used the toolkit alone (child only group, $n = 60$) in the Doll program. Group 2 used the toolkit with their parents (child and parent group, $n = 60$) in the Doll program.

Parents were briefed on research procedures, measures used, and participant rights during parental meetings. The Doll program was offered as an extracurricular school activity for group 1 children. Group 1 children completed the toolkit in the school's multimedia classroom, supervised by two trained teachers. Group 1 teachers ensured that students used the toolkit individually. Group 2 children, using devices such as cell phones, tablets, or computers, completed the toolkit at home as part of their regular homework assignments with their parents. Parents actively engaged in their children's toolkit use, guiding them, and participating in discussions.

Quizzes or tasks were implemented at the conclusion of each chapter of the e-toolkit to ensure children's active involvement in learning. Additionally, parents in group 2 were provided with a paper version of the family learning log. They were asked to record their progress after finishing each chapter, ensuring active involvement in shared learning.

The CKAQ-RIII (Chinese version) was assessed twice during the summer trimester of the 2022 school year: 1) at time 1, to

TABLE 1 | Main, interaction effects, and simple effects analysis (China, 2022).

Measures	Variables		Pre-test	Post-test	Time simple effects			Main and interaction effects		
			M ± SD	M ± SD	df	F	Partial η^2	df	F	Partial η^2
ATS[a](0–9)	Group 1 (n = 54)		4.33 ± 2.40	4.98 ± 2.46	1	12.550**	0.071			
	Group 2 (n = 53)		4.36 ± 2.50	5.13 ± 2.27	1	17.546***	0.097			
	Group 3 (n = 60)		4.27 ± 2.16	4.22 ± 1.95	1	28.840	0.001			
	Group simple effects	df	2	2						
		F	0.023	2.792						
		Partial η^2	0.000	0.033						
	Time							1	19.258***	0.105
	Group							2	0.868	0.010
	Time x Group							2	6.263**	0.071
ITS[b](0–24)	Group 1 (n = 54)		10.52 ± 3.69	13.33 ± 3.62	1	520.418***	0.760			
	Group 2 (n = 53)		11.17 ± 3.16	15.25 ± 3.32	1	1070.755***	0.867			
	Group 3 (n = 60)		10.63 ± 3.71	11.12 ± 3.54	1	17.019***	0.094			
	Group simple effects	df	2	2						
		F	0.519	19.726***						
		Partial η^2	0.006	0.194						
	Time							1	1223.487***	0.882
	Group							2	6.294**	0.071
	Time × Group							2	230.136***	0.737

*** indicates* p-*value < 0.01, *** indicates* p-*value < 0.001.*

[a]*The CKAQ-RIII (Children's Knowledge of Abuse Questionnaire) consists of 33 items, with 9 items forming the Appropriate Touch Scale (ATS).*

[b]*The CKAQ-RIII (Children's Knowledge of Abuse Questionnaire) consists of 33 items, with 24 items constituting the Inappropriate Touch Scale (ITS).*

TABLE 2 | Pairwise comparisons of inappropriate and appropriate touch scores among three groups at two time points adjusted by Bonferroni (China, 2022).

Measures	Time		Group 1	Group 2	Group 3
ATS[a](0–9)	Pre-test	Group 1	—		
		Group 2	p = 1.000	—	
		Group 3	p = 1.000	p = 1.000	—
	Post-test	Group 1	—		
		Group 2	p = 1.000	—	
		Group 3	p = 0.207	p = 0.092	—
ITS[b](0–24)	Pre-test	Group 1	—		
		Group 2	p = 1.000	—	
		Group 3	p = 1.000	p = 1.000	—
	Post-test	Group 1	—		
		Group 2	p = 0.016	—	
		Group 3	p = 0.003	p < 0.001	—

[a]*The CKAQ-RIII (Children's Knowledge of Abuse Questionnaire) consists of 33 items, with 9 items forming the Appropriate Touch Scale (ATS).*

[b]*The CKAQ-RIII (Children's Knowledge of Abuse Questionnaire) consists of 33 items, with 24 items constituting the Inappropriate Touch Scale (ITS).*

gauge children's understanding of CSA concepts before the intervention, and 2) at time 2, around 5 weeks later following their involvement in the Doll program. In all cases, the administrator verbally repeated each question twice, giving every child sufficient time to respond or seek clarification. Overall, the children exhibited a strong understanding of the questions, and the need for repetition was minimal.

Students in groups 1 and 2 who did not complete at least 50 percent of the tasks or quizzes in the toolkit, as well as students in group 2 with predominantly blank home learning logs (fewer than three entries), and those who missed the tests due to illness, were excluded from the analysis. The final evaluation (**Figure 2**) included a total of 167 students: group 1 (child only), n = 54; group 2 (child and parent), n = 53; group 3 (control), n = 60.

Data Analysis

We conducted a comprehensive analysis using Two-Way Mixed ANOVA to examine the interaction, main, and simple effects of the three groups on the two scales at two time points (**Table 1**). Subsequently, we performed separate multiple comparisons for the three groups' scores on the two scales at each time point, employing the Bonferroni correction method (**Table 2**).

RESULTS

Our data adhered to normal distribution assumptions (Shapiro-Wilk's test, $p > 0.05$) and demonstrated homogeneity in both variances (Levene's test, $p > 0.05$) and covariances (Box's M test, $p > 0.001$). The following sections present detailed results of this data analysis for each scale.

ATS: Appropriate Touch Scale

ATS scores showed a significant interaction involving group and time [F (2, 164) = 6.263, p = 0.002, partial η^2 = 0.071]. The effect of time was significant, indicating differences in ATS scores over time [F (1, 164) = 19.258, p < 0.001, partial η^2 = 0.105]. Conversely, the influence of different groups did not uncover substantial distinctions in mean ATS scores [F (2, 164) = 0.868, p = 0.422, partial η^2 = 0.010].

With regard to the simple effects of group (**Table 1**), there were no significant differences in children's knowledge observed at time 1 (pre-test), F (2, 164) = 0.023, p = 0.977, partial η^2 = 0.000.

However, there was still no statistically significantly difference in all 3 groups at time 2 after the intervention, F (2, 164) = 2.792, p = 0.064, partial η^2 = 0.033.

Regarding the simple effects of time (**Table 1**), ATS scores for students in group 1 (child only) exhibited a noteworthy enhancement from time 1 to time 2, F (1, 53) = 12.550, p = 0.001, partial η^2 = 0.071. Similarly, ATS scores significantly improved for students in group 2 (child and parent) between the initial assessment to the follow-up evaluation, F (1, 52) = 17.546, $p < 0.001$, partial η^2 = 0.097. Nevertheless, no statistically significant disparity emerged in ATS scores for students in group 3 (control group) from the baseline evaluation to the follow-up assessment, F (1, 59) = 28.840, p = 0.774, partial η^2 = 0.001.

ITS: Inappropriate Touch Scale

An evident interaction between groups and time was found for ITS [F (2, 164) = 230.136, $p < 0.001$, partial η^2 = 0.737]. There was a clear difference in mean ITS score across the various time intervals, F (1, 164) = 1223.487, $p < 0.001$, partial η^2 = 0.882. Notably, group membership also exhibited a significant impact on mean ITS scores, F (2, 164) = 6.294, p = 0.002, partial η^2 = 0.071.

Regarding the simple effects of group (**Table 1**), children's knowledge did not show a significant difference at time 1 (pre-test), F (2, 164) = 0.519, p = 0.596, partial η^2 = 0.006. However, after the intervention, there was a significant difference at time 2 (post-test), F (2, 164) = 19.726, $p < 0.001$, partial η^2 = 0.194.

Multiple comparisons (**Table 2**) revealed that group 1 demonstrated a notably higher ITS score (p = 0.003) in contrast to the control group (group 3). Likewise, group 2 exhibited a substantial increase in the ITS score ($p < 0.001$) compared to group 3. Additionally, there was a significant distinction in the ITS score between group 1 and group 2 (p = 0.016).

With regard to the simple effects of time (**Table 1**), in the child-only group (group 1), ITS scores notably increased from the initial assessment to the subsequent evaluation, F (1, 53) = 520.418, $p < 0.001$, partial η^2 = 0.760. Similarly, the child and parent group (group 2) demonstrated significant enhancements in their ITS scores from the initial assessment to the subsequent evaluation, F (1, 52) = 1070.755, $p < 0.001$, partial η^2 = 0.867. Although there was no intervention in group 3, ITS scores in group 3 significantly improved from the initial assessment to post-test (M = 11.117, SE = 0.452), F (1, 59) = 17.049, $p < 0.001$, partial η^2 = 0.094.

DISCUSSION

The purpose of this study was to investigate the efficacy of the Doll Program in enhancing knowledge of sexual abuse prevention among early-grade elementary school children. We recruited 181 students from Beijing elementary schools, randomly assigning them to one of three groups: 1) child only, 2) child and parent, or 3) control group. The Children's Knowledge of Abuse Questionnaire was utilized to examine pre-test and post-test scores on the two subscales—Appropriate Touch Scale and Inappropriate Touch Scale. The following outcomes are revealed in the data discussed below in relation to the hypothesized questions.

Addressing Hypothesis 1, our results indicate that involvement in the Doll program substantially improved awareness of child sexual abuse prevention, particularly in recognizing inappropriate touching. This signifies a notable advancement in child-specific knowledge.

All three groups exhibited similar levels of knowledge regarding appropriate and inappropriate touch before any intervention. The scores on the Appropriate Touch Subscale at pre-test (p = 0.977) and the Inappropriate Touch Subscale (p = 0.596) showed no significant differences among the three groups.

Both group 1 (p = 0.001) and group 2 ($p < 0.001$) students significantly increased their ATS scores at post-test compared to pre-test. While there were no statistically meaningful distinctions among the three groups at time 2, the control group's ATS scores did not exhibit a significant increase from pre-test to post-test (p = 0.774). It indicates that students in the intervention groups gained more knowledge about appropriate touch than before, albeit to a lesser extent.

Regarding the Inappropriate Touch Subscale, group 1 and group 2 both demonstrated a significant difference in scores between the pre-test and post-test ($p < 0.001$), while group 3 did not exhibit this difference. Furthermore, in multiple comparisons, the understanding of inappropriate touch was significantly higher in both group 1 and group 2 than in the control group (p = 0.003, $p < 0.001$). Overall, the participation in the Doll program significantly enhanced children's grasp of CSA prevention knowledge, particularly regarding inappropriate touching. These outcomes align with prior studies that assessed CSA programs using the CKAQ-RIII [16, 45, 46].

Regarding Hypothesis 2, parental involvement appears to positively impact the understanding of inappropriate touching, as indicated by the significant difference in ITS scores (p = 0.016) between group 1 (child only) and group 2 (child and parent) at post-test. It is suggested that the inclusion of parents in the Doll program may have motivated children to explore more scenarios related to sexual abuse. Further research is necessary to delineate the specific positive roles played by parents in the Doll program.

Finally, the results reveal that while the control group showed no significant change in Appropriate Touch Scale scores, there was a notable increase in Inappropriate Touch Scale scores between pre-test and post-test ($p < 0.001$). This suggests a significant improvement in the control group's awareness of inappropriate touching over time. One plausible explanation is that the pre-test acted as a motivator for some children to seek correct answers, leading to an enhanced understanding through discussions or increased attention to the subject matter. Another plausible explanation is that these children may have been exposed to related information through other curricular aspects. These findings are consistent with Tutty's research, where children who had not participated in a prevention program still displayed noteworthy shifts in knowledge over a 5-month period, encompassing both aspects of touch appropriateness and inappropriateness [42]. Comparable

outcomes were also noted in another study conducted by Tutty and in the implementation of the HOOC program for preventing CSA [41, 45].

Limitations

First, it is crucial to highlight that our study solely involved the measurement of two data sets: the pre-test and post-test (5 weeks), demonstrating the Doll's effectiveness in increasing children's knowledge of sexual abuse prevention. However, it is noteworthy that our study did not delve into the long-term knowledge retention within the program, a dimension commonly scrutinized in other evaluation studies [17, 45, 51]. Hence, it is imperative to complement the Doll program with a follow-up evaluation.

Additionally, it is essential to refrain from assuming a direct link between improved knowledge, evaluated through the CKAQ-RIII, and subsequent behavioral changes leading to a reduction in the risk of CSA for participants [4, 46, 52, 53]. While there is a common assumption that increased knowledge and skills correspond to behavioral changes in real-life scenarios [54], evidence supporting the preventive impact of knowledge acquisition on sexual abuse is lacking [55]. The effectiveness of the Doll prevention program in reducing future instances of sexual abuse remains uncertain, necessitating additional research.

Furthermore, Sexual abuse prevention programs have faced scrutiny over the balance between program benefits and potential drawbacks, including inducing anxiety or impeding cooperation and trust in adults [56]. Hence, in addition to emphasizing the positive outcomes of CSA prevention programs, numerous studies have scrutinized potential negative effects. These evaluations encompass possible detrimental consequences such as anxiety, touch aversion, fear, mistrust of people, etc. [17, 47], [57–59], and found that the majority of children are not adversely affected by exposure to CSA prevention programs. Instead, children experienced an increase in knowledge of sexual abuse prevention [17, 58], a decrease in self-blame for sexual abuse [60], a rise in the disclosure of sexual abuse incidents [61], an improvement in parent-child communication [62], and no increase in sexual problems [63]. Our current study does not evaluate potential negative impacts of the Doll program. Subsequent studies will encompass a broader range of children to evaluate the program's appropriateness.

Finally, while parents participated in our study, the Doll program's main focus lies in fostering children's awareness of sexual abuse prevention rather than delivering explicit instructions to parents. Critics argue that child-directed CSA programs place the prevention responsibility on victims [4], but it's crucial to recognize their positive impact in enhancing children's knowledge for self-protection. Simultaneously, there's a moral duty to equip children with tools for effective action against sexual abuse [56]. However, Child-focused CSA programs are just one part of a CSA prevention. Preventing child sexual abuse requires not only educating and empowering children but also engaging parents, teachers, social workers and other stakeholders to participate in prevention programs [64–66]. In future studies, we need to iterate on the Doll program, involving other stakeholders such as parents and teachers, to ensure a more comprehensive impact.

Conclusion

Despite these limitations, the findings carry significant implications. They suggest that the Doll program effectively enhances participants' CSA knowledge, highlighting the efficacy of the e-educational toolkit in achieving substantial knowledge gains. This improvement could potentially lead to increased adoption of CSA prevention skills, ultimately contributing to lower rates of CSA—a crucial area for future research. The cost-effective implementation of the e-educational toolkit in the Doll program makes it particularly suitable for environments with limited educational resources, which provides valuable insights into preventing child sexual abuse in countries with conservative sexual education contexts and scarce resources, such as China. Additionally, the findings shed light on the impact of parental engagement on learning. Future research should focus on enhancing the Doll program, iterating the e-toolkit to involve a broader range of stakeholders, including parents and teachers, and providing training.

ETHICS STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional Review Board (IRB) at Beijing Institute of Technology (BIT-EC-H-2023097) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

AUTHOR CONTRIBUTIONS

KX: first author. KX, JF: collection. JY: senior advisor. JF: advisor, corrections. JF: last and corresponding author. All authors contributed to the article and approved the submitted version.

CONFLICT OF INTEREST

The authors declare that they do not have any conflicts of interest.

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