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Brief, Scalable School-Based Yoga Program and Longitudinal Changes in Prosocial Emotion and Minor School Injuries: A Pilot Study

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Abstract

School-based injury prevention has traditionally emphasized environmental and educational approaches, whereas body-based interventions have received less attention. This pilot study examined longitudinal changes in gratitude and minor school injuries among primary school children participating in a brief video-based yoga program. A 10-minute structured yoga program was delivered once weekly via video during routine morning homeroom activities from September 2025 to February 2026. The program was provided universally in one public primary school and required no specialized facilities or trained instructors. Gratitude was assessed before and after the intervention, and monthly frequencies of school infirmary visits due to bruises and lacerations were examined across six observation periods. Among 187 children, gratitude increased significantly from pre- to post-intervention. The frequency of infirmary visits due to bruises changed significantly over time, whereas no significant temporal change was observed for lacerations. A brief, universally delivered, video-based school yoga program was associated with longitudinal changes in gratitude and bruises, but not lacerations. These preliminary findings suggest that such a program may be feasible for integration into routine school activities. Controlled studies are needed to determine whether these observed changes can be attributed to the yoga program.

Keywords: video-based school yoga program, gratitude, bruises, school health, injury prevention.

Introduction

School safety frameworks increasingly conceptualize schools as comprehensive "all-hazards" environments, encompassing classrooms, playgrounds, and access routes where children are exposed to injury risks (Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector, 2022). Unintentional injuries remain a leading cause of morbidity and mortality among school-aged children worldwide, highlighting the importance of effective school-based injury prevention. In Japan, the number of reported school injuries has also increased (Muramatsu, 2020). At the same time, schools are expected to support children's holistic development, including social and emotional competencies (United Nations Educational, Scientific and Cultural Organization, 2021). Gratitude, a prosocial emotion shaped through interactions with parents, peers, and teachers, has been associated with children's psychological and physical well-being (e.g., Kerry et al., 2023), and its cultivation is recognized as an important educational objective in Japan (Ministry of Education, Culture, Sports, Science and Technology, 2009). Yoga-based interventions may provide a feasible approach for addressing both physical and psychological aspects of children's development; however, empirical studies examining changes in both gratitude and school injuries following school-based yoga participation remain scarce.

Existing school-based injury prevention strategies have primarily emphasized environmental modification, school policies, and safety education, and previous reviews have indicated comparatively limited attention to body-based interventions (Bruce & McGrath, 2005; Dodd et al., 2022; Dowswell et al., 1995; Orton et al., 2017). Although exercise-based injury prevention programs have demonstrated effectiveness in sports settings (Rössler et al., 2014), evidence regarding body-based injury prevention interventions in primary school settings remains limited, particularly among children under 14 years of age. There is therefore a need to examine whether universally implemented body-based approaches can be incorporated into routine school practice and may be relevant to common unintentional injuries, including bruises. Yoga is a physical and mental practice originating in

ancient India (Wahbeh et al., 2008) that combines physical postures, breath control, and concentration (Mooventhan & Khode, 2014). Previous systematic reviews have suggested that yoga practice is associated with balance, proprioceptive function, and motor skills (Jeter et al., 2014; Sivaramakrishnan et al., 2019; Verma et al., 2023). Because these functions are involved in the control of body movement and postural stability, changes in these functions may be relevant to the occurrence of common unintentional injuries in children, including minor injuries such as bruises. However, whether participation in school-based yoga programs is associated with longitudinal changes in common unintentional injuries among primary school children remains insufficiently examined.

Yoga has also been associated with psychological outcomes, including gratitude (e.g., Ahmadi et al., 2016; Parkinson & Smith, 2023). Gratitude is an emotion arising from the perception of a positive outcome resulting from another person's actions, although the concept has also been extended to positive outcomes arising from other sources (Emmons & McCullough, 2003; Walker et al., 2016). Gratitude may be relevant to school-based interventions because it reflects a positive psychological orientation that may be related to practices involving attention, breathing, and mindful awareness (Ivtzan et al., 2016; Miranda et al., 2024). However, longitudinal changes in gratitude among primary school children participating in school-based yoga programs remain insufficiently examined.

Accordingly, the present study examined longitudinal changes in gratitude and minor school injuries, including bruises, among primary school children participating in a brief video-based school yoga program. Given the absence of a control group, the study was designed to examine changes over time rather than to establish causal effects of the yoga program. We hypothesized that (1) gratitude would change over the course of participation in the school-based yoga program and (2) the occurrence of minor school injuries, including bruises, would change over the same period.

Method

Participants and intervention procedures

The intervention consisted of a 10-minute video-based yoga program delivered during weekly morning homeroom sessions from September 2025 to February 2026. The video-guided sessions were implemented once per week and provided to all children enrolled in the participating public elementary school as part of routine school-based activities. The yoga program included breathing exercises, gentle stretching, and age-appropriate postural movements designed to promote body awareness and self-regulation. No deviations from the intervention protocol were reported. A total of 187 children (85 boys and 102 girls; mean age = 10.06 years, SD = 1.46) for whom informed consent was obtained were included in the final analytic sample. The primary outcomes were gratitude toward others, assessed as an indicator of prosocial emotion, and the occurrence of minor school injuries, specifically contusions (bruises) and lacerations, recorded during the intervention period.

Asa (morning) yoga sequence

The "Asa Yoga" program consisted of a structured sequence of physical postures (āsana), breathing techniques (prāṇāyāma), and attention-focused meditation. The structured āsana sequence was based on the 15-minute protocol described by Shiota et al. (2026) and was shortened and adapted for delivery within a 10-minute school-based session. The āsana sequence included Urdhva Hastasana (Upward Salute), Vrksasana (Tree Pose), Beetle Pose, Stag Beetle Pose, and traditional sumo inspired stomping and controlled leg-raising movements. In addition, participants performed either Beetle Pose or Stag Beetle Pose, which were alternated weekly throughout the intervention period. Following completion of the āsana sequence, participants engaged in a brief attention-focused meditation designed to enhance awareness of breathing and bodily sensations. No loving-kindness meditation or other compassion-based contemplative practices were included in the intervention. The intervention protocol was fully standardized and delivered through pre-recorded instructional videos. To maintain participant engagement and minimize habituation, new instructional videos were recorded and distributed weekly throughout the intervention period; however, the intervention content, procedures, and sequence remained identical across all sessions. The program was designed to be feasible within school-based educational settings and aimed to promote balance, flexibility, attentional stability, bodily awareness, and self-regulatory capacity among children.

Measures

Interpersonal Gratitude Scale for Children

Gratitude was measured using the eight-item Interpersonal Gratitude Scale for Children (Fujiwara et al., 2014). This scale consists of eight items evaluating children's gratitude toward others. Responses were recorded on a 5-point Likert scale ranging from 1 ("Does not describe me well") to 5 ("Describes me very well"), with higher scores indicating greater gratitude toward others.

Visits to the School Infirmary Due to Lacerations and Bruises

The number of visits to the school infirmary attributable to lacerations and bruises was recorded monthly by the school nurse. Injury frequencies were aggregated and analyzed on a monthly basis throughout the intervention period (September, October, November, December, January, and February) to examine temporal changes in school infirmary visits due to lacerations and bruises.

Statistical analysis

Paired-samples t-tests were conducted to examine changes in Interpersonal Gratitude Scale for Children scores from pre-intervention to post-intervention. Effect sizes were calculated using Cohen's d, and 95% confidence intervals were reported. To examine temporal changes in injury occurrence, one-way analyses of variance (ANOVAs) were conducted on grade-level frequencies of school infirmary visits due to bruises and lacerations across the six monthly observation periods.

Results

A one-way ANOVA was conducted on grade-level frequencies of school infirmary visits due to bruises across the six monthly observation periods. A significant main effect of time was observed ($F(5, 30) = 4.79$, $p < .05$, $\eta^2 = .44$). Post hoc analyses revealed significantly fewer infirmary visits due to bruises in November and January than in September and October (all $p < .05$). A one-way ANOVA was conducted on grade-level frequencies of school infirmary visits due to lacerations across the six monthly observation periods. No significant main effect of time was observed ($F(5, 30) = 1.93$, n.s.). Gratitude scores significantly increased from pre-intervention to post-intervention ($t(186) = 2.41$, $p < .05$, $d = 0.18$, 95% CI [0.03, 0.32]). A marginally significant reduction was also observed in December compared with September and October ($p < .10$).

Discussion

In the present study, we examined longitudinal changes in the frequency of school infirmary visits due to bruises and lacerations, as well as gratitude, among children participating in a video-based structured yoga program. The results showed significant changes in the frequency of visits due to bruises and in gratitude over the study period, whereas no significant change was observed in the frequency of visits due to lacerations. The temporal change observed in the frequency of visits due to bruises may be relevant to the physical components of the program. Yoga involves physical postures that require control of body position and movement, and previous systematic reviews and meta-analyses have suggested that yoga may be associated with mobility, balance, proprioceptive function, and motor skills (Ban et al., 2021; Verma et al., 2023; Youkhana et al., 2016). These functions contribute to postural stability and movement control and may therefore be relevant to events resulting in minor injuries such as bruises. However, the present study did not directly assess these functions or other potential mechanisms; therefore, the observed temporal change in bruises should not be interpreted as evidence that the yoga program prevented these injuries. Controlled studies with direct assessments of relevant physical functions are needed to examine whether school-based yoga programs may contribute to the prevention of minor unintentional injuries. The absence of a significant change in lacerations, in contrast to the temporal change observed in bruises, may reflect differences in the circumstances under which these injuries occur. Bruises may more often result from physical contact, collisions, or falls, whereas lacerations may be more closely related to contact with sharp objects or other environmental factors. Thus, even if participation in the yoga program was associated with changes in physical control or attention, such changes may have had limited relevance to injuries more strongly influenced by specific environmental circumstances. This interpretation remains speculative because the present study did not examine the specific circumstances or mechanisms underlying individual injuries.

The observed change in gratitude may be interpreted in the context of the multidimensional nature of the yoga program. The intervention combined physical postures, breathing exercises, and attention-focused meditation rather than directly teaching gratitude as a psychological skill. These practices may have provided opportunities for children to regulate bodily and attentional states, which could in turn be relevant to their openness to positive experiences and interpersonal relationships (Ivtzan et al., 2016; Miranda et al., 2024; Sawyer et al., 2022). Gratitude involves the recognition and appreciation of positive outcomes and benevolent actions by others (Emmons & McCullough, 2003; Walker et al., 2016). Thus, greater bodily and emotional stability or sustained attention to present experiences may be associated with greater receptivity to positive interpersonal experiences, which could be reflected in changes in gratitude (Quaglia et al., 2015; Lopes et al., 2005; Wilson et al., 2020). This interpretation is consistent with a previous study by our group proposing that yoga-based practices may influence self- and other-related psychological processes through changes in bodily and emotional regulation (Shiota et al., 2026). However, the present study did not directly assess emotional regulation, mindfulness, interpersonal openness, or other potential mediating processes. This proposed pathway therefore remains theoretical and should be examined using direct measures of these mechanisms. The practical significance of the present study extends beyond examining whether yoga "works." The brief, once-weekly video-based program was integrated into routine morning homeroom activities, required no specialized facilities or trained instructors, and was delivered universally to participating children. These features highlight the implementation potential of a scalable school-based program associated with longitudinal changes in both gratitude and an injury-related outcome.

Several limitations should be acknowledged. First, the single-group design and absence of a control group preclude causal inferences regarding the effects of the yoga program. Second, the study was conducted in a single primary school, limiting the generalizability of the findings. Third, gratitude was the only psychological outcome assessed, and potential mechanisms, including changes in balance, body awareness, and other physical or attentional functions, were not directly measured. Fourth, injury records provided limited information on injury severity and the specific circumstances surrounding each injury. Finally, natural seasonal variation in injury occurrence and psychological outcomes cannot be completely excluded. Future studies should use controlled designs, recruit multiple schools, assess a broader range of psychological and physical mechanisms, and collect more detailed information on injury characteristics and circumstances. A brief, video-based school yoga program was associated with longitudinal changes in gratitude and bruises, but not lacerations. These preliminary findings suggest that a universally delivered body-based program may be integrated into routine school activities and may represent a feasible component of comprehensive school-based health and injury prevention strategies. Controlled studies with larger and more diverse samples and direct assessments of potential mechanisms are needed to determine whether these observed changes can be attributed to the yoga program.

Implications for Practice

The present findings have several implications for school-based practice. First, a brief, video-based yoga program may be feasible for integration into routine school activities, such as morning homeroom, without requiring specialized facilities or trained instructors. This delivery format may facilitate universal access and reduce the organizational burden associated with implementing school-based health programs. Second, the observed longitudinal changes in gratitude and bruises suggest that school-based yoga may have relevance to both psychological well-being and physical health. However, because the present study used a single-group design without a control condition, these changes should not be interpreted as evidence of preventive or causal effects. Schools may therefore consider brief yoga programs as a potentially complementary component of broader health and well-being initiatives rather than as a standalone injury-prevention intervention. Finally, the standardized and video-based format may facilitate consistent delivery across classrooms and support future dissemination. For implementation, schools should prioritize fidelity to the established program while recognizing that its potential benefits may depend on contextual and seasonal factors. Further controlled, multi-school studies are needed before specific recommendations regarding injury prevention or psychological outcomes can be made.

Contributors

Conceived and designed the experiments: SS, TO, and HH. Performed recruitment and conducted experiments: SS, YH, and TO. Performed the analyses and wrote the manuscript: SS. HH coordinated all procedures with the Board of Education and participating schools, including obtaining ethical approval and managing administrative agreements. All authors have approved the final article.

Statement of Declarations

Role of the Funding source

None.

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Conflict of Interest

The authors have no conflicts of interest to declare.

Data availability

The data sets generated and analyzed in this study are available from the corresponding author (e-mail: syo.shiota@gmail.com) upon reasonable request.

Human Subjects Approval Statement

This study was conducted as a pilot study within the compulsory education curriculum in public elementary schools in Kitakyushu City, Fukuoka Prefecture, Japan. Prior to the implementation of the intervention, informed consent was obtained from the principal of the participating school and from the children's guardians.

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Figure 1: Changes in children's gratitude following the intervention. Error bars represent standard deviations.

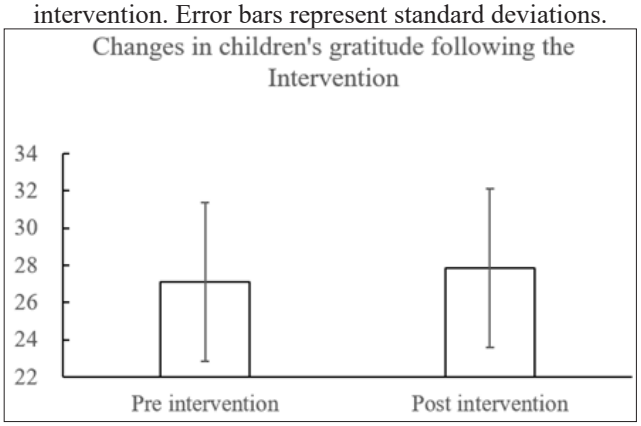


Table 1: Descriptive Statistics for Gratitude Scores Before and After the Yoga Intervention

	Pre	Post
Self-esteem Scale by Rosenberg for Elementary and Junior High School Students	27.12 (4.26)	27.87 (4.26)

Data are given as mean of total score in each subscale (standard deviation)

Table 2: Monthly distribution of bruises by grade during the study period

Grade	September	October	November	December	January	February
First grader	41	53	17	8	13	17
Second grader	33	36	1	3	4	11
Third grader	18	19	5	5	2	3
Fourth grader	29	12	7	13	2	4
Fifth grader	9	17	1	8	4	10
Sixth grader	9	6	3	8	7	6

Note. Values represent the number of injury events recorded in each grade and month. The study period extended from September to February.

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