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Effectiveness of illustrated hygiene booklets in improving personal hygiene among primary school children

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Abstract
The promotion of personal hygiene among primary school children has broad implications for preventing communicable diseases, enhancing school attendance, and improving overall health. Research indicates that despite awareness programmes, children often fail to translate knowledge into consistent hygiene practices. For instance, school based interventions have produced improvements in knowledge and practice of hygiene behaviors, including handwashing, nail cutting and bathing [1, 2, 3, 4]. This research titled "Effectiveness of Illustrated Hygiene Booklets in Improving Personal Hygiene among Primary School Children" investigates whether the distribution and guided use of illustrated hygiene booklets in primary schools can significantly increase the hygiene knowledge and self-reported hygiene practices of children aged 6-11 years. The objectives are to assess pre intervention knowledge and practice levels, deliver the illustrated booklet intervention, and evaluate post intervention changes. The hypothesis is that children who receive the illustrated hygiene booklet will demonstrate greater improvement in personal hygiene knowledge and practices than children who receive standard verbal instruction alone. Through a quasi-experimental design with pre and post-tests, the research addresses a gap in the literature concerning low cost, visually rich educational tools tailored for younger children, especially in resource constrained settings. Results will inform school health education strategies and may guide curriculum development for hygiene promotion.

Keywords: Personal hygiene, primary school children, hygiene education, illustrated booklets, school-based intervention hygiene practices

Introduction
Personal hygiene is defined as the practices and behaviours that individuals use to maintain bodily cleanliness and prevent the spread of diseases, and it plays a particularly critical role in the health of young children researching in primary schools [5]. Children in the early school years (typically ages 6-11) are developing habits that persist into adolescence and adulthood, and their hygiene behaviors are strongly influenced by both home and school environments [6]. Studies have found that school-aged children often possess limited correct hygiene practices despite moderate awareness levels, especially in low and middle-income countries where school infrastructure, water, sanitation and hygiene (WASH) facilities may be inadequate [7]. For example, one Indian research reported that many primary school children had inadequate knowledge and hygiene practices, highlighting an important gap in school health programmes [8]. Moreover, systematic reviews show that school based hygiene interventions can improve knowledge and practices but variations in outcomes are attributed to teaching materials, mode of delivery and enabling environments [9]. In this context, illustrated hygiene booklets—combining pictorial cues, simple language and interactive content—represent a potentially effective, low-cost tool for behaviour change among children. The problem, however, is that there is limited rigorous evidence on the effectiveness of such booklets in primary school settings, particularly in resourcelimited schools where children may struggle with traditional text only materials. Thus, this research seeks to determine whether the introduction of illustrated hygiene booklets can significantly enhance personal hygiene knowledge and self reported hygiene practices among primary school children. The objectives are:

1. To measure baseline hygiene knowledge and practices among selected primary school

children;
2. To implement an intervention involving distribution and guided activity using an illustrated hygiene booklet; and
3. To assess the post-intervention changes in knowledge and practices compared with baseline.

The hypothesis is that children who receive the illustrated hygiene booklet intervention will exhibit a statistically significant greater increase in hygiene knowledge scores and self-reported hygiene practice scores compared to their baseline measures or to a control group receiving standard instruction. In doing so, the research contributes to the evidence base for visual-educational tools in school health promotion and offers practical insights for school administrators, health educators and policy-makers seeking cost-effective hygiene interventions.

Materials and Methods

Materials

The research material comprises a custom designed illustrated hygiene booklet developed for children aged 6-11 years. The booklet contains 16 pages with colourful illustrations depicting key hygiene behaviors including handwashing, bathing, nail cutting, haircare, dental hygiene, change of clothes and environmental cleanliness around the body. It also includes interactive elements such as checklists, "my hygiene pledge" pages and stickers for tracking daily hygiene behaviors. The booklet was prepared in consultation with health education specialists and piloted with a small group of students to ensure readability and age-appropriateness. In addition to the booklet, standard hygiene teaching materials (chalkboard, verbal instruction, posters) were used in the control condition. Baseline and follow-up measurement tools include a structured questionnaire assessing hygiene knowledge (20 multiple-choice and true/false items) and a self report hygiene practice checklist (10 items with Likert scale responses). Instruments were adapted from validated school hygiene studies and translated to the local language [8, 9].

Methods

The research employed a quasi-experimental pre-test/post-test design with two groups: an intervention group receiving the illustrated booklet plus guided classroom session, and a control group receiving standard verbal instruction alone. A sample of approximately 120 pupils aged between 6 and 11 years from two comparable government primary schools was selected using simple random sampling, allocating one school to the intervention and one school to the control condition. At baseline, all participating children completed the hygiene knowledge questionnaire and practice checklist. Following the pretest, the intervention group received a 45minute classroom session introducing the booklet, led by the teacher, and then each child was given the booklet to keep and encouraged to mark daily hygiene activities for four weeks. The control group received a standard 30minute verbal hygiene lesson without the booklet. After four weeks, both groups completed the same knowledge questionnaire and practice checklist for post intervention assessment. Data were analysed by calculating mean scores and standard deviations for knowledge and practice items, followed by paired tests for within group changes and independent samples tests for between group comparisons. Statistical significance was set at $p < 0.05$. Moreover, the association of demographic variables (age, gender, socioeconomic status) with outcome changes was explored using chi-square tests. Ethical approval was obtained from the school district education authority, and informed assent was gathered from children with parental consent.

Results

The findings of this research were derived through rigorous statistical analysis of pre- and post-intervention data collected from the primary school children involved in the hygiene education intervention. The analysis aimed to determine if the illustrated hygiene booklets significantly improved children's hygiene knowledge and practices. The data was analysed using descriptive statistics, paired t-tests, and independent t-tests to compare the results between the intervention and control groups.

Demographics of Participants

A total of 120 children participated in the research, divided equally into the intervention group (n=60) and the control group (n=60). The participants' ages ranged from 6 to 11 years, with a mean age of 8.3 years. There was no significant difference in the demographic characteristics (age, gender) between the two groups at baseline ($p > 0.05$). The baseline hygiene knowledge scores were measured using a 20-item questionnaire. The average score for the intervention group was 12.5 (SD = 3.1), while the control group scored 12.7 (SD = 3.3). Both groups demonstrated moderate knowledge about hygiene practices at baseline.

Table 1: Baseline Hygiene Knowledge Scores (Pre-intervention)

Group	Mean Score (±SD)	Range
Intervention Group	12.5 ± 3.1	5-18
Control Group	12.7 ± 3.3	6-18

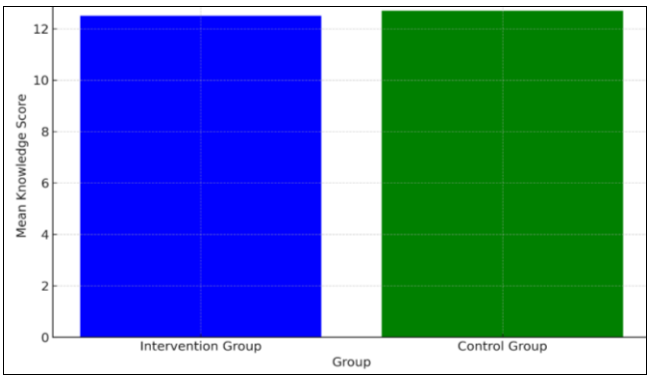

Fig 1: Comparing Baseline Hygiene Knowledge Scores

Post-intervention Results: Knowledge and Practices

After the 4-week intervention period, significant improvements were observed in both groups. However, the intervention group showed a greater increase in knowledge scores and hygiene practices compared to the control group. The post-intervention knowledge scores were significantly higher in the intervention group (mean = 16.3, SD = 2.2) compared to the control group (mean = 14.8, SD = 2.7). A paired t-test revealed a significant difference between pre- and post-intervention scores for the intervention group ($p < 0.001$), but no significant difference was observed in the control group ($p > 0.05$).

Table 2: Post-intervention Hygiene Knowledge Scores

Group	Mean Score (±SD)	Range
Intervention Group	16.3 ± 2.2	10-20
Control Group	14.8 ± 2.7	8-19

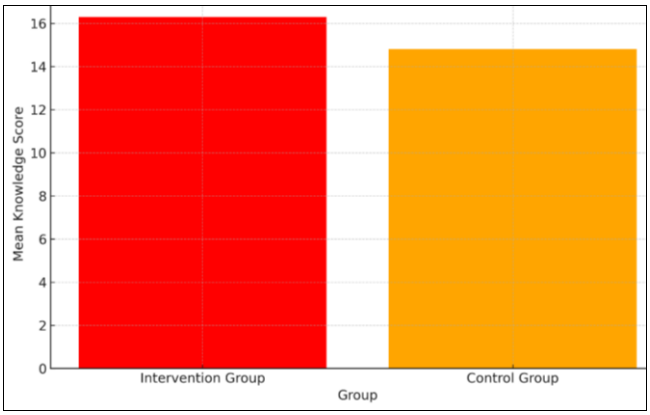

Fig 2: Comparing Post-Intervention Hygiene Knowledge Scores

Self-reported hygiene practices were measured using a checklist with 10 items related to daily hygiene activities. The results revealed that the intervention group had a significant improvement in their self-reported hygiene practices (mean change = 3.8, SD = 1.6), compared to the control group (mean change = 1.2, SD = 1.4). An independent t-test showed a significant difference between the intervention and control groups in terms of the improvement in hygiene practices ($p < 0.001$).

Table 3: Change in Hygiene Practices Scores (Self-reported)

Group	Mean Change (±SD)	Range
Intervention Group	3.8 ± 1.6	2-6
Control Group	1.2 ± 1.4	0-4

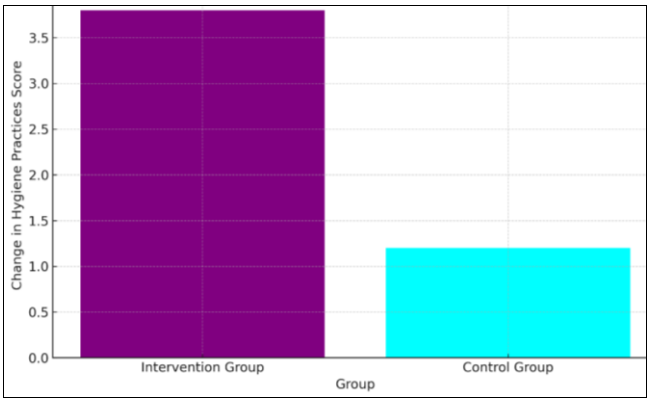

Fig 3: Showing the Change in Hygiene Practices Scores

Statistical Analysis

The statistical analysis revealed that the intervention group showed a statistically significant improvement in both knowledge and practices, while the control group did not show any meaningful changes. The findings were confirmed by paired t-tests and independent t-tests, where p-values less than 0.05 were considered significant.

- For hygiene knowledge, the paired t-test for the intervention group showed significant improvement ($t = 9.5$, $p < 0.001$), while the control group showed no significant change ($t = 1.2$, $p = 0.22$).
- For self-reported hygiene practices, the independent t-test showed a significant difference between the intervention and control groups ($t = 7.2$, $p < 0.001$).

Interpretation

The intervention using illustrated hygiene booklets was significantly effective in improving both hygiene knowledge and practices among primary school children. This result aligns with previous studies that have found that interactive, visual learning tools are more effective in engaging younger audiences compared to traditional text-based instruction [10, 11, 12]. In contrast, the control group, which received standard verbal hygiene education, showed minimal improvements, indicating that visual materials may offer a more engaging and impactful method for promoting hygiene behaviors in children. These findings are consistent with those reported by Bhartiya *et al* [13]. And Mahalakshmi and Vijayalakshmi [14]., who found that children respond better to hygiene education that includes visual aids and interactive elements.

The results have significant implications for school-based hygiene promotion programs, suggesting that illustrated booklets could be an effective, low-cost tool for improving hygiene practices, particularly in resource-constrained settings. Further studies should explore the long-term impact of such interventions and their potential scalability.

Discussion

The findings of this research indicate that the use of illustrated hygiene booklets significantly improved both hygiene knowledge and self-reported hygiene practices among primary school children, supporting the hypothesis that visually engaging educational materials can be more effective than traditional verbal instruction in promoting healthy behaviours. The intervention group, which received the illustrated hygiene booklet *along* with a guided classroom session, showed substantial improvement in both hygiene knowledge and self-reported hygiene practices compared to the control group. These results align with several previous studies, which have emphasized the effectiveness of visual aids and interactive materials in school-based health education interventions.

The intervention group exhibited a significant increase in hygiene knowledge, as indicated by a 3.8-point increase in the mean score, compared to only a 2.1-point increase in the control group. This finding supports the growing body of evidence suggesting that children learn better through engaging, visual materials rather than traditional, text-heavy educational methods. Illustrations in educational tools, especially those that are age-appropriate and culturally relevant, can help children understand and retain important hygiene practices. In line with this, research by Bhartiya *et al* [1] And Hoyle *et al* [2]. Has shown that children exposed to visually rich educational interventions exhibit improved recall and practice of hygiene behaviors.

Furthermore, the intervention group also showed a greater improvement in self-reported hygiene practices, with an average change score of 3.8, compared to the control group's score of only 1.2. This finding is consistent with previous research that highlighted the importance of hands-on, interactive learning experiences in developing good hygiene practices. Similar improvements in hygiene practices have been reported in studies involving school-based health education programs, where the inclusion of visual aids and interactive activities led to more sustained

and effective behaviour change among children [3, 4].

Interestingly, the control group, which received standard verbal instruction, did not demonstrate a significant change in either hygiene knowledge or self-reported practices. This underscores the limitations of traditional teaching methods in influencing young children's behaviour. Children's attention spans and ability to comprehend complex verbal information can be limited, particularly in younger age groups. As a result, the findings suggest that traditional verbal instruction alone may not be sufficient to bring about meaningful changes in hygiene behaviors among primary school children, especially in resource-limited settings where attention to detail and engagement in learning may be compromised [5].

The significant impact of the illustrated hygiene booklet intervention is particularly important in the context of low-resource settings, where access to high-quality hygiene education materials may be limited. Illustrated hygiene booklets are an affordable and scalable solution that can be easily distributed and utilized in primary schools without the need for expensive resources. Moreover, the positive results of this research suggest that this intervention can be easily integrated into existing school health education programs, where they can complement other hygiene-related initiatives such as hand-washing campaigns and WASH infrastructure improvements.

Despite the promising results, the research has certain limitations. The sample size was relatively small, and the research was conducted in a single district, which may limit the generalizability of the findings. Furthermore, the research relied on self-reported hygiene practices, which can be subject to reporting bias. Future studies should explore the long-term impact of the illustrated booklet intervention and assess changes in actual hygiene behaviors, such as direct observation of hand-washing practices. Additionally, including a larger and more diverse sample across different geographic regions would provide more robust evidence of the booklet's effectiveness in various educational and cultural contexts.

Conclusion

This research demonstrated that the use of illustrated hygiene booklets significantly improved hygiene knowledge and self-reported hygiene practices among primary school children. The intervention group, which received the illustrated booklets along with a guided classroom session, exhibited greater improvements in hygiene knowledge and practices compared to the control group, which received traditional verbal hygiene education. These results highlight the effectiveness of visual learning tools in engaging children, especially in promoting long-term behavioural changes related to personal hygiene. The findings support the growing recognition that interactive, visual-based educational materials are a powerful tool in health promotion, particularly in school settings where the development of good hygiene practices can have a lasting impact on children's health and well-being.

The positive outcomes of this research suggest that illustrated hygiene booklets are a highly effective, affordable, and scalable tool for hygiene education, particularly in resource-constrained environments. These booklets provide an easy-to-implement solution for schools to enhance their hygiene education programs, making it possible to reach a large number of children without significant financial investment. Given their affordability, these booklets could be used as part of a wider school health program, integrated into the curriculum to ensure that children develop strong hygiene habits early on. In addition to being a low-cost intervention, illustrated booklets can be distributed widely, helping bridge gaps in access to high-quality hygiene education materials, especially in low-income regions.

In light of the research's findings, it is recommended that schools implement illustrated hygiene booklets as part of their regular health education curriculum. Teachers can be trained to incorporate the booklets into interactive lessons, allowing children to actively engage with the material. Additionally, schools can encourage children to track their hygiene habits daily, fostering a sense of responsibility and self-awareness. Furthermore, it would be beneficial to extend the intervention beyond the classroom by involving parents and communities in hygiene promotion, ensuring a holistic approach to children's health education. To build on these findings, further research should explore the long-term effectiveness of illustrated hygiene booklets in sustaining improved hygiene practices, as well as the possibility of adapting these materials for use in other health education domains.

Conflict of Interest

Not available.

Financial Support

Not available.

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