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Effectiveness of a Video-Assisted Teaching Programme on Road Safety Knowledge Among Middle School Children in Delhi NCR

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Abstract

Background: Road traffic injuries are a leading cause of mortality among adolescents, yet traditional educational methods often fail to engage this demographic effectively.

Objective: To assess the effectiveness of a Video-Assisted Teaching Programme (VATP) in enhancing knowledge regarding road safety measures among middle school children aged 11–14 years.

Methods: A quasi-experimental, one-group pre-test/post-test design was utilized. A random sample of 60 middle school students from Delhi NCR completed a structured knowledge questionnaire before and after the VATP intervention. Data were analyzed using paired t-tests and Chi-square tests.

Results: The mean knowledge score significantly increased from 13.98 to 24.12 post-intervention ($t = 36.88$, $p < 0.001$). The proportion of students with "adequate" knowledge rose from 0% to 78.3%. Post-test knowledge levels were significantly associated with the student's class, school type, and parental education.

Conclusion: The VATP is a highly effective educational intervention for improving road safety knowledge among young adolescents, supporting its integration into school health curricula.

1. Introduction

Road safety is a critical public health focus, particularly for middle school children who are increasingly exposed to traffic hazards as they gain independent mobility. Among children and adolescents, road traffic injuries account for a staggering 38.4% mortality rate. Despite their increasing exposure to roads, children's perceptions of safety rules and practices remain limited.

Traditional educational methods, such as lectures and printed materials, are often inadequate for holding the attention of young learners or ensuring long-term knowledge retention. To address this gap, Video-Assisted Teaching Programmes (VATP) have emerged as a promising alternative. By utilizing interactive multimedia, real-life scenarios, and visual demonstrations, VATPs cater to the innate human preference for visual information and the digital fluency of modern students.

This study aimed to evaluate the effectiveness of a VATP in enhancing the level of knowledge regarding road safety measures among middle school children aged 11–14 years.

2. Methodology

2.1 Study Design and Setting

A quantitative evaluative approach using a quasi-experimental, one-group pre-test/post-test design was employed. The study was conducted at Rajkiya Girls Inter College and Jain Inter College in the Delhi NCR region, providing a representative sample of the local student population.

2.2 Participants

The target population comprised middle school children aged 11 to 14 years. A sample size of 60 students was selected using a random sampling technique to ensure a fair and unbiased representation.

2.3 Intervention and Instrument

Intervention: A 20-minute 2D animated Video-Assisted Teaching Programme (with Hindi voice-over and English subtitles) was utilized. The module covered topics including pedestrian safety, crossing rules, traffic signs, vehicle safety, and basic first aid.

Instrument: Data were collected using a structured, bilingual knowledge questionnaire divided into two sections: a 10-item demographic profile and a 30-item multiple-choice test on road safety measures.

2.4 Data Analysis

Data were analyzed using SPSS Version 25.0. Descriptive statistics (mean, standard deviation, frequencies) were used to summarize data. Inferential statistics, specifically the paired t-test, were used to evaluate the effectiveness of the intervention, while Chi-square tests analyzed associations between knowledge levels and demographic variables, with significance set at $p < 0.05$.

3. Results

3.1 Demographic Characteristics

- The sample was relatively balanced in gender (51.7% male, 48.3% female).
- A majority of participants (63.3%) attended government schools.
- Notably, 65.0% of the students reported having no prior formal information regarding road safety measures before the study.

3.2 Effectiveness of the VATP

The intervention resulted in a profound improvement in knowledge scores:

- Overall Scores: The mean pre-test score was 13.98 (SD = 2.88), which increased significantly to a post-test mean of 24.12 (SD = 2.18). The paired t-test yielded $t = 36.88$ ($p < 0.001$), demonstrating highly significant effectiveness.
- Categorical Shift: Prior to the VATP, 0% of students scored in the “Adequate” range (21–30 points), and 15% scored in the “Inadequate” range. Post-intervention, the “Inadequate” category was eliminated (0%), and 78.3% of students achieved an “Adequate” level of knowledge.
- Domain-Specific Gains: Improvement was observed across all six safety domains. The highest mean gain occurred in visual, rule-based topics like “Zebra Crossing” (2.20 point gain), while the lowest gain was in the practical skill of “First Aid” (1.17 point gain).

3.3 Demographic Associations

Chi-square analysis revealed that post-test knowledge levels were significantly associated with:

- Student’s class/standard ($p = 0.012$)
- Type of school ($p = 0.006$)
- Parental education level ($p = 0.016$)

There was no significant association between post-test knowledge and gender (p = 0.844) or prior information on road safety (p = 0.389).

4. Discussion

The findings provide robust evidence that the Video-Assisted Teaching Programme is a highly potent tool for transforming road safety knowledge among young adolescents. The simultaneous engagement of visual and verbal channels in the multimedia format likely contributed to stronger encoding and recall of information.

A notable outcome of the study is the intervention's "leveling effect." The lack of association between post-test knowledge and prior road safety exposure indicates that the VATP successfully bridged baseline knowledge gaps, bringing previously uninformed students up to the same proficiency level as their peers. Furthermore, the lack of gender association suggests the tool is inclusive and universally applicable.

The differential learning outcomes across domains offer valuable curricular insights. Highly visual concepts (like traffic lights and zebra crossings) translated perfectly to the screen, whereas psychomotor skills like first aid saw comparatively lower gains. This suggests that an optimal road safety curriculum should utilize a blended approach: using VATP for foundational rules, supplemented by hands-on practice for physical skills.

The significant associations with school type and parental education highlight the role of socio-educational capital. Students in private schools or with highly educated parents benefited even more, pointing to the need for targeted, supplemental support when implementing such interventions in under-resourced environments.

4.1 Limitations

The study was limited by its quasi-experimental design without a control group, making it susceptible to confounding variables and the Hawthorne effect. Additionally, the study measured knowledge acquisition rather than actual behavioral changes on the road, and the long-term retention of this knowledge remains unassessed.

5. Conclusion

The Video-Assisted Teaching Programme is an exceptionally effective intervention for enhancing road safety knowledge among middle school children. The findings strongly advocate for public health practitioners, educators, and policymakers to formally integrate evidence-based, multimedia road safety modules into mandatory school health curricula to mitigate preventable traffic-related injuries among youth.