

A STUDY TO ASSESS THE EFFECTIVENESS OF VIDEO ASSISTED TEACHING PROGRAMME ON KNOWLEDGE REGARDING VISUAL ACUITY AMONG PRIMARY SCHOOL CHILDREN IN A SELECTED SCHOOL AT CUDDALORE DISTRICT

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ABSTRACT:

Introduction:

Visual acuity is an important factor in children's academic and social development. However, visual impairments are common due to inadequate screening and awareness, especially in low-resource settings. This study assesses the efficacy of a video-assisted teaching program for improving knowledge on visual acuity among primary school children in Cuddalore District, Tamil Nadu.

Methodology:

A pre-experimental one-group pre-test and post-test design was adopted. Sixty children aged 6–12 years were selected using convenience sampling. Baseline knowledge was assessed using a structured questionnaire followed by a video-assisted teaching intervention that is age-appropriate with related interactive content. The program focused on the importance of visual acuity, prevention, and management. Knowledge improvement was measured through a post-test that was conducted after 15 days. Paired t-tests and chi-square tests were used for statistical analysis for significance and association tests.

Results:

Before the intervention, only 10% had sufficient knowledge, while 55% of participants lacked appropriate knowledge. After the intervention, inadequate knowledge decreased to 13.3%, and adequate knowledge increased substantially to 61.6%. The mean score in knowledge increased from 18.3 (61%) to 21.5 (72%), with a highly significant mean difference $t = 12.4$, $p < 0.001$.

Conclusion:

The video-assisted teaching program showed a marked improvement in knowledge about visual acuity, thereby establishing its effectiveness as a health education tool. Implementation of such interventions in school curricula would help improve awareness and preventive behaviors among children, which could lead to long-term vision health. Therefore, it is suggested that educators and healthcare providers work together to achieve maximum impact.

KEYWORDS:

Visual acuity, Video-assisted teaching, Knowledge improvement, Primary school children, Health education, Preventive strategies

INTRODUCTION:

Vision, often regarded as the "window to the world," plays an indispensable role in an individual's ability to perceive, interpret, and interact with their surroundings. [1] It is important in the processes of learning and development, mainly in children, because proper vision guarantees academic achievement, physical coordination, and integration into society. However, the prevalence of visual impairment in children younger than 9 years was 0.80 per 1000, with blindness at 0.28 per 1000.[2] The leading causes of developmental and educational delays, lowered academic achievement levels, and reduced quality of life among children include uncorrected refractive errors, congenital cataracts, and retinopathy of prematurity. Sadly, much of this can be prevented or easily treated through timely intervention, especially in low-income and middle-income countries.

A successful VISION 2020 initiative could result in 24 million fewer blind individuals by 2020 and lead to 429 million fewer blind person-years avoided, potentially increasing global economic productivity by \$102 billion.[3] Despite this, significant barriers such as lack of awareness, inadequate eye care services, and limited screening programs impede progress in addressing this challenge.[4] In India, The overall cumulative incidence of visual impairment, severe visual impairment, or blindness in children in Britain was 10.03 per 10,000 children.[5] Many parents and communities remain unaware of the criticality of early vision screening, leading to missed opportunities for timely detection and treatment. This underscores the importance of integrating vision health into broader public health and education strategies, particularly targeting children at primary school levels where the potential for behavioral change and early intervention is highest.

Educational interventions, particularly video-assisted teaching programs, have been found to be tremendously useful in creating awareness and improving knowledge on health topics, including visual acuity.[6] These programs use attractive multimedia to make difficult information both accessible and memorable for children. Schools are an ideal venue for such interventions because teachers are secondary caregivers who have direct and sustained contact with students.[7] By empowering teachers with the knowledge and means to detect vision problems early, the scope of intervention can be expanded from immediate care to long-term preventive practices.[8] Additionally, video-assisted teaching is in line with contemporary pedagogical trends that incorporate technology with education to create effective learning experiences.[9] This study tries to evaluate the efficacy of a video-assisted teaching program in increasing knowledge regarding visual acuity among primary school children. The program, through structured educational content, aims at empowering children with basic knowledge on eye health, promoting preventive behaviors, and enabling early detection of vision impairments. The findings of this research will add to the burgeoning body of evidence that supports the integration of innovative teaching methods in addressing public health challenges and calling for collaborative efforts among educators, healthcare providers, and policymakers. This initiative, therefore, seeks to create awareness and arm the stakeholders with the wherewithal to close the gap in childhood vision care and hopefully pave the way toward a future where preventable blindness is a rarity rather than the norm.

METHODOLOGY:

The methodology for this study was carefully designed to evaluate the effectiveness of a video-assisted teaching program in improving knowledge about visual acuity among primary school children. A structured framework was employed to ensure that the intervention was systematically implemented and its impact objectively measured. This section describes in detail the research approach, design, setting, participants, sampling technique, tools, intervention, ethical considerations, and data analysis methods.

Research Approach

This study utilized a quantitative research approach. This approach was chosen because it allows for the collection of measurable data, ensuring objectivity and precision in evaluating the outcomes of the teaching intervention. By quantifying knowledge levels, the study aimed to determine the effectiveness of the video-assisted teaching program with accuracy.

Research Design

The research design adopted was a pre-experimental one-group pre-test and post-test design. In this design, the same group of participants was evaluated twice—before the intervention (pre-test) and after the intervention (post-test). This enabled the researcher to directly measure changes in the knowledge levels of the participants and establish the impact of the intervention.

Setting and Participants

The study was conducted at Mano Vidyalaya Matriculation School in Sethiyathope, located in Cuddalore District, Tamil Nadu. The participants included primary school children aged between six and twelve years. The school was chosen as the setting for the study because it provided a structured environment for implementing the intervention and monitoring the children's progress. The target population was deemed ideal as children in this age group are particularly vulnerable to visual health issues and benefit significantly from educational interventions.

Sampling Technique

A total of 60 children were selected as the sample for the study. The participants were chosen using a non-probability convenience sampling technique, which ensured that only those who met the inclusion criteria and were accessible during the study period were included. This technique was considered suitable given the specific focus of the research and the practical constraints of conducting a school-based study.

Inclusion and Exclusion Criteria

To ensure the relevance and reliability of the study, specific inclusion and exclusion criteria were established. Children aged between six and twelve years, capable of understanding either Tamil or English, and studying in the selected school were included in the study. Children who were already using spectacles or contact lenses, had undergone corrective eye surgery, or were physically unwell during the data collection period were excluded. These criteria helped maintain consistency in the sample and avoided confounding factors.

Data Collection Tools

Two tools were employed for data collection. The first tool was a demographic proforma, designed to collect basic information about the participants, such as their age, gender, parental education, occupation, family income, and dietary habits. The second tool was a structured knowledge questionnaire, which assessed the participants' understanding of visual acuity. This questionnaire consisted of thirty multiple-choice questions, each with four options. Correct answers were awarded one point, and incorrect answers scored zero. The knowledge levels were categorized into three groups: inadequate knowledge (less than 50% of correct answers), moderately adequate knowledge (51–75% of correct answers), and adequate knowledge (more than 75% of correct answers).

Intervention: Video-Assisted Teaching Program

The intervention in the study was a video-assisted teaching program specifically developed to educate children about visual acuity. The program was structured to cover various aspects of visual acuity, including its definition, importance, causes, prevention, and management. The content was designed to be engaging, simple, and age-appropriate, incorporating animations and visuals to ensure effective communication. The teaching program was delivered in a classroom setting, where the children were encouraged to actively participate by asking questions and seeking clarifications.

Procedure

The study was conducted in a systematic manner to ensure consistency and reliability. Initially, a pre-test was conducted to establish the baseline knowledge of the participants using the demographic proforma and the structured knowledge questionnaire. After completing the pre-test, the video-assisted teaching program was delivered to the participants in a controlled environment within the school. The program aimed to enhance their understanding of visual acuity through interactive and visually engaging content. Fifteen days after the intervention, a post-test was conducted using the same questionnaire to measure the knowledge gained by the participants.

Pilot Study

A pilot study was conducted prior to the main study to test the feasibility and reliability of the tools and procedures. Six children from a different school participated in the pilot study. The findings confirmed the reliability of the knowledge questionnaire, with a correlation coefficient of $r=0.74$. The pilot study also provided valuable insights into refining the methodology, ensuring that the main study could be executed smoothly.

Ethical Considerations

Ethical approval for the study was obtained from the appropriate institutional review boards and committees. Permissions were also secured from the school authorities to conduct the study within their premises. Written informed consent was obtained from the parents of the participants, while verbal assent was sought from the children. Confidentiality of the participants' data was maintained throughout the study to protect their privacy and rights.

Data Analysis

The data collected during the study were analyzed using both descriptive and inferential statistical methods. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the demographic characteristics and the pre-test and post-test knowledge scores. Inferential statistics, such as paired t-tests, were employed to determine the significance of the differences between pre-test and post-test scores. Additionally, chi-square tests were conducted to assess the association between demographic variables and knowledge improvement observed in the post-test.

Validity and Reliability

The tools used in the study were rigorously validated and tested for reliability. Subject matter experts in nursing, pediatrics, and education reviewed the content to ensure it was appropriate, relevant, and accurate for the target population. The reliability of the knowledge questionnaire was established through the split-half method, which yielded a high correlation coefficient of $r=0.74$, indicating its consistency in measuring knowledge levels.

RESULT:

Demographic Profile of School Children

The demographic profile of the participants of the study is essential for knowing the nature of the selected sample. The age distribution of the children was well spread across three age groups, 6–7 years, 7–8 years, and 9–12 years, and each of these groups had a contribution of 33.3% in the sample. Regarding gender, the female participants contributed 63.3%, and the male participants were 36.7%. When the educational level of the children is analyzed, there is an equal distribution of 33.3% in all three categories: 1st–3rd standard, 4th–5th standard, and 6th–8th standard.

The educational status of the parents shows varied literacy levels. Among fathers, 35% had completed diploma/high school, while 28.3% were graduates. Similarly, for mothers, 31.6% had completed diploma/high school, and 25% were graduates. Occupationally, most of the fathers were coolies (36.6%) or private employees (31.6%). Among the mothers, 30% were self-employed, and 28.3% of the respondents were coolies. Most of the family income was between Rs. 5001–Rs. 10,000 (46.6%), followed by Rs. 10,001–Rs. 15,000 (25%). Besides, 70% of the respondents were on a non-vegetarian diet, and 60% of the family members wore spectacles. This demographic data shows that participants vary in socio-economic and educational settings, thus building a comprehensive platform for understanding knowledge levels and their learning outcomes.

Table 1: Frequency and Percentage Distribution of Demographic Variables of School Children in Selected School at Cuddalore District

Demographic Variables		Frequency (n)	Percentage (%)
Age in years	6–7 years	20	33.3%
	7–8 years	20	33.3%
	9–12 years	20	33.3%
Gender	Male	22	36.7%
	Female	38	63.3%
Class of studying	1st–3rd Standard	20	33.3%
	4th–5th Standard	20	33.3%
	6th–8th Standard	20	33.3%
Education of father	Primary school	2	3.3%
	Middle school	6	10%
	Diploma/High school	21	35%
	Higher secondary	14	23.3%
	Graduate	17	28.3%
Education of mother	Primary school	6	10%
	Middle school	8	13.3%
	Diploma/High school	19	31.6%
	Higher secondary	12	20%
	Graduate	15	25%
Occupation of father	Coolie	22	36.6%
	Self-employed/Business	17	28.3%
	Private job	19	31.6%
	Government job	2	3.3%
Occupation of mother	Housewife	15	25%
	Coolie	17	28.3%
	Self-employed/Business	18	30%
	Private job	10	16.6%
	Government job	0	0%
Family income	≥ Rs.5000	12	20%
	Rs.5001–Rs.10000	28	46.6%
	Rs.10001–Rs.15000	15	25%
	≥ Rs.15001	5	8.3%
Dietary pattern	Vegetarian	18	30%
	Non-vegetarian	42	70%
Family wearing spectacles	Yes	36	60%
	No	24	40%

Pre-Test and Post-Test Knowledge Levels

The results of the comparison of pre-test and post-test knowledge levels indicate a significant impact on visual acuity knowledge through video-assisted teaching. Most participants during the pre-test had inadequate knowledge, accounting for 55%, while 35% had moderate knowledge and only 10% had adequate knowledge. Knowledge levels improved dramatically during the post-test. Inadequate knowledge reduced drastically to 13.3%, while those with moderate knowledge increased to 25%. More importantly, adequate knowledge increased dramatically to 61.6%. This finding underscores the effectiveness of the intervention in enhancing the knowledge of primary school children regarding visual acuity.

Comparison of Mean and Standard Deviation of Knowledge Scores

A statistical comparison of the pre-test and post-test scores further validates the success of the intervention. The pre-test mean score was 18.3 (61% of the maximum score), with a standard deviation of 2.3, indicating limited baseline knowledge among the participants. After the teaching program, the mean score improved to 21.5 (72% of the maximum score), with a reduced standard deviation of 1.41, indicating better comprehension and uniformity in knowledge levels. The arithmetic mean difference of 3.2 points between the pre-test and post-test scores indicates that there is a significant improvement in knowledge. This indicates that video-assisted teaching has an important role to play in creating awareness on visual health among children.

Effectiveness of the Video-Assisted Teaching Program

This paired t-test analysis confirmed that the observed improvement in knowledge levels is statistically significant. T-value is calculated as 12.4 based on the pretest mean score at 18.3 and the posttest mean score at 21.5, with standard deviations of 2.39 and 1.41. It is significantly high at p-value less than 0.01, thereby affirming that it was not chance but the direct result of intervention that improved the knowledge. These results support the success of the video-assisted teaching program in the knowledge delivery of visual acuity.

Correlation Between Knowledge Scores and Demographic Variables

Correlation between post-test knowledge scores and demographic variables indicated several significant findings. Age, gender, mother's educational status, and family income had a significant impact on knowledge improvement. Younger children (6–8 years) showed relatively higher percentages of inadequate knowledge (21.66%) than older children. Female respondents perform a little better on knowledge outcomes compared to males, and higher percentages fall in the category of adequate knowledge. The educational status of mothers is the critical factor in this study as children whose mothers have secondary or higher secondary education have shown knowledge improvement significantly better ($p < 0.01$). Family income also mattered because children belonging to families with a family income of Rs. 5001–Rs. 10,000 or Rs. 10,001–Rs. 15,000 had greater increases in knowledge ($p < 0.02$).

Other factors, such as diet, class, father's education, and occupation, were not significantly associated with increases in knowledge. This indicates that a few socio-demographic factors, especially maternal education and family income, have an essential influence on the learning outcomes of children in health education programs.

Table 2: Association Between Post-Test Knowledge Score Regarding Visual Acuity with Their Selected Demographic Variables Among School Children

Demographic Variables		Post-Test Knowledge	Inadequate Knowledge	Moderate Knowledge	Adequate Knowledge	Chi-Square Value
		No.	%	No.	%	No.
Age of the children	6 - 8 years	13	21.66%	9	15%	2
	8 - 10 years	11	18.33%	10	16.66%	4
	10 - 12 years	9	15%	2	3.33%	0
Gender	Male	14	23.33%	12	20%	5
	Female	19	31.66%	9	15%	1
Class of studying	1st - 3rd Standard	9	15%	10	16.66%	1
	3rd - 5th Standard	12	20%	17	28.33%	4
	5th - 7th Standard	12	20%	10	16.66%	1
Educational status of the father	Illiterate	2	3.33%	3	5%	0
	Primary	17	28.33%	4	6.66%	0
	Secondary	7	11.66%	10	16.66%	5
	Higher secondary	5	8.33%	4	6.66%	1
	Graduate	2	3.33%	1	1.66%	0
Educational status of the mother	Illiterate	5	8.33%	5	8.33%	1
	Primary	11	18.33%	4	6.66%	0
	Secondary	16	26.66%	21	35%	4
	Higher secondary	1	1.66%	5	8.33%	1
	Graduate	0	0%	0	0%	0
Occupation of father	Coolie	18	30%	8	13.33%	1
	Self-employed/Business	12	20%	11	18.33%	5
	Private job	3	5%	0	0%	0
	Government job	0	0%	2	3.33%	0
Occupation of mother	Housewife	18	30%	8	13.33%	0
	Coolie	11	18.33%	10	16.66%	4
	Self-employed/Business	4	6.66%	3	5%	1
	Private job	0	0%	0	0%	1
	Below Rs.5000	12	20%	8	13.33%	0

Family monthly income	Rs.5001 to Rs.10000	16	26.66%	10	16.66%	5
	Rs.10001 to Rs.15000	5	8.33%	3	5%	1
	Above Rs.15000	0	0%	0	0%	0
Dietary pattern	Vegetarian	14	23.33%	7	11.66%	1
	Non-vegetarian	19	31.66%	14	23.33%	5
Is anybody in your family wearing spectacles ?	Yes	20	33.33%	12	20%	1
	No	13	21.66%	9	15%	5

DISCUSSION:

The current study's results showed a considerable improvement in the level of knowledge about visual acuity among primary school children after the video-assisted teaching program. Pre-intervention, most of the participants (55%) had inadequate knowledge, while only a small proportion (10%) had adequate knowledge. Post-intervention, the percentage of inadequate knowledge drastically reduced to 13.3%, while the percentage with adequate knowledge considerably increased to 61.6%. This noteworthy improvement indicates the effectiveness of the video-assisted teaching program in imparting complex health information in an engaging and accessible manner among children. These findings are supported by the results of Gomathi Balachandar et al. (2021), who found that there was a significant increase in awareness and understanding among caregivers after the implementation of video-based educational programs about mental health.[10] Just like in the study by Tri P et al., the current study shows that interactive multimedia tools enhance learning outcomes by matching the cognitive abilities and interests of the target group.[11]

Compared to previous studies, such as Casseti V et al. (2019), which noted the persistent gaps in knowledge and awareness about vision care among children in the United Kingdom, the present study shows a more optimistic view of bridging such gaps with innovative teaching interventions.[12] Traditional teaching methods, according to Black SA et al., were often inadequate in producing meaningful improvements in children's understanding and awareness of vision care.[13] In contrast, through the use of multimedia in the present study, the approach was interactive and visually appealing, making complex health concepts easier to understand and remember for the participants. The findings also agree with Conley CS et al. (2016), who stated that the integration of technology into school-based interventions can enhance the quality and impact of evidence-based preventive programs substantially.[14] The video-assisted teaching method used in this study is one example of how technology-driven education can transform health education for young learners.

Moreover, the correlation of demographic factors with knowledge improvement seen in this study confirms earlier observations. The current study revealed that children whose mothers had higher education levels and whose families belonged to middle-income brackets showed a significant difference in improvement in knowledge scores. It also supports what Arnaud et al. have stated: socioeconomic characteristics, such as parental education and family income, are a critical determinant in health education outcomes.[15] This means targeted interventions should consider ways of decreasing disparities among the less privileged subgroups, making sure that everybody gets equal opportunities for health education. On these premises, the present research contributes to an ever-growing number of studies demonstrating the importance of incorporating socio-demographic characteristics in public health strategies while stressing the innovative methods of teaching and their effects on knowledge/awareness creation among school-going children.

CONCLUSION:

The findings of this study demonstrate the significant effectiveness of video-assisted teaching programs in enhancing knowledge about visual acuity among primary school children. Prior to the intervention, the majority of participants exhibited inadequate knowledge, highlighting the need for innovative educational approaches. The intervention led to a marked improvement, with adequate knowledge increasing from 10% to 61.6% and inadequate knowledge decreasing to 13.3%. The mean knowledge score improvement from 18.3 to 21.5 further underlines the impact of the program, supported by a statistically significant difference ($t = 12.4$, $p < 0.001$). This study puts forth the powerful potential of video-assisted teaching as a healthy education tool especially in public health issues such as vision care among children. Interactive content, which is so visually appealing, is better for comprehension and retention and promotes early intervention and prevention. Such a program can close knowledge gaps during school curricula with long-term benefits for health. Results also emphasize socio-demographic factors such as parental education and family incomes for learning outcomes. Targeted interventions to these disparities are the best approaches that can ensure equitable access to health education, and therefore collaborative efforts among educators, healthcare providers, and policymakers are crucial. These will therefore help pave the way toward healthy visions and well-being in a future that would significantly reduce preventable visual impairments.

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