

Effectiveness of Video-Assisted Teaching on Knowledge and Attitude Regarding Overexposure of Digital Technology among College Students in Bengaluru

Satheesh Kumar B N

Lecturer, Department of Psychiatric Nursing, Shri Atal Bihari Vajpayee Institute of Nursing, Bengaluru, Karnataka, India
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Abstract: ***Background:** Digital technology is deeply integrated into the educational, social and recreational lives of young people. However, prolonged and poorly regulated use of smartphones, computers, social media and other digital platforms may be associated with physical discomfort, sleep disturbance, reduced concentration, psychological difficulties and impaired face-to-face interaction. Health education is therefore important for promoting balanced and responsible digital use. **Objective:** To assess the effectiveness of video-assisted teaching on knowledge and attitude regarding overexposure of digital technology among students of a selected degree college in Bengaluru. **Methods:** A quantitative pre-experimental, one-group pre-test post-test design was adopted. Sixty students were selected from a population of 238 students using systematic random sampling. Data were collected using a structured 20-item knowledge questionnaire and a 10-item three-point Likert attitude scale. A 30-minute video-assisted teaching programme was provided after the pre-test, followed by post-test assessment. Descriptive and inferential statistics were used for analysis. **Results:** Before the intervention, 4 (6.67%) students had inadequate knowledge, 28 (46.67%) had average knowledge and 28 (46.67%) had adequate knowledge. After the intervention, 54 (90%) had adequate knowledge, 6 (10%) had average knowledge and none had inadequate knowledge. The mean knowledge score increased from 13.88 (SD 2.57) to 17.32 (SD 1.70), with a mean difference of 3.44 and $t=11.83$ ($df=59$). Pre-intervention attitude was positive in 52 (86.67%), neutral in 7 (11.67%) and negative in 1 (1.67%); after the intervention, all 60 (100%) demonstrated a positive attitude. Mean attitude increased from 25.62 (SD 2.99) to 29.78 (SD 0.58), with a mean difference of 4.16 and $t=10.97$ ($df=59$). A strong positive correlation was reported between pre-intervention knowledge and attitude scores ($r=0.96$). Significant associations were reported between type of family and pre-intervention knowledge, and between type of family and education of parents and pre-intervention attitude. **Conclusion:** In this study, video-assisted teaching was associated with improved knowledge and attitude regarding digital overexposure among the participating college students. The findings support the use of structured audiovisual health education as one component of digital-health promotion among youth.*

Keywords: Video-assisted teaching; digital overexposure; digital technology; knowledge; attitude; college students; Bengaluru

1. Introduction

Digital technology has become an integral component of contemporary life. Smartphones, computers, tablets, social networking sites, online learning platforms and streaming services are used by young people for education, communication, entertainment and information seeking. The increasing accessibility of digital devices has created important opportunities for learning and social connection, but it has also increased concern about prolonged and unregulated exposure. The dissertation underlying this manuscript describes digital overexposure as a situation in which digital-device use may interfere with physical, psychological, emotional and social well-being. [1,2]

Young people may spend substantial periods of the day interacting with screens. The source dissertation identifies possible consequences including eye strain, headache, sleep disturbance, reduced physical activity, musculoskeletal discomfort, reduced concentration, anxiety, social withdrawal and difficulties in maintaining face-to-face relationships. The literature reviewed in the dissertation also describes associations between high digital exposure and sleep problems, academic distraction, stress, reduced physical activity and other health-related concerns. [3-12]

The relationship between technology use and health is complex because digital devices also have legitimate educational and social functions. Consequently, health education should not simply focus on eliminating technology use; rather, it should help students recognize excessive patterns, understand possible consequences and develop practical strategies for balanced use. The dissertation therefore focused on awareness of overexposure and on preventive approaches such as time management, device-free periods, physical activity, screen breaks and responsible digital behaviour.

Video-assisted teaching provides an audiovisual approach that can combine narration, images, demonstrations and examples. For health education, this format may make information easier to understand and remember. The present study was designed to determine whether a structured video-assisted teaching programme could improve knowledge and attitude regarding overexposure of digital technology among college students in Bengaluru.

2. Need for the Study

The increasing use of digital devices among young people makes digital-health education relevant to nursing and community health practice. The source study identified

concerns related to physical health, sleep, psychological well-being, attention, social interaction and academic functioning. It also emphasized that students may use digital devices for long periods without recognizing the effects of excessive or poorly regulated use. Within educational institutions, nurses and nurse educators can contribute to prevention by providing accurate information, encouraging healthy routines, and guiding students and families toward balanced digital habits. The dissertation specifically identified the need to create awareness among degree students and selected video-assisted teaching as the intervention. The study setting in Bengaluru provided an opportunity to evaluate the intervention among 60 students from a defined college population.

3. Objectives

- To assess the pre-intervention knowledge and attitude regarding overexposure of digital technology among students of a selected degree college in Bengaluru.
- To develop and implement a video-assisted teaching programme regarding overexposure of digital technology among the students.
- To assess the post-intervention knowledge and attitude regarding overexposure of digital technology among the students.
- To determine the correlation between pre-intervention knowledge and attitude scores.
- To determine the association between pre-intervention knowledge and attitude scores and selected socio-demographic variables.

4. Hypotheses

- H1: There will be a significant difference between pre- and post-intervention knowledge and attitude scores regarding overexposure of digital technology.
- H2: There will be a significant correlation between pre-intervention knowledge and attitude scores.
- H3: There will be a significant association between pre-intervention knowledge and attitude scores and selected socio-demographic variables.

5. Methodology

Research approach and design: A quantitative approach was used. The study adopted a pre-experimental one-group pre-test post-test design (O1 X O2). The pre-test included assessment of knowledge and attitude, followed by the video-assisted teaching intervention and post-test assessment.

Setting and population: The study was conducted at Shri Atal Bihari Vajpayee Institute of Nursing, Bengaluru. The population comprised 238 students. The sample consisted of 60 students who met the inclusion criteria. The dissertation reports systematic random sampling as the sampling method.

Sample selection: Students who were willing to participate and available during data collection were eligible. Students who were unavailable during the study and those who had come across a similar study were excluded. The sample-size calculation in the dissertation produced a recommended

sample of approximately 59, after which 60 participants were included.

Variables: The independent variable was the video-assisted teaching programme regarding overexposure of digital technology. The dependent variables were knowledge and attitude regarding digital overexposure. Demographic variables included age, gender, current scheme of study, type of family, education of parents, occupation of parents, monthly income of parents and previous exposure to a similar study.

Data-collection tools: Section A collected socio-demographic information. Section B was a structured questionnaire containing 20 knowledge questions. Section C was a 10-item three-point Likert attitude scale. The knowledge questionnaire addressed causes, effects and prevention of digital overuse. The attitude scale assessed students' feelings, opinions and responses toward digital technology and its overuse.

Intervention: A pre-designed 30-minute video-assisted teaching programme on overexposure of digital technology was provided on the same day after the pre-test. The intervention covered the effects of excessive digital exposure and practical preventive measures, including responsible use, time management, scheduled device-free periods, regular physical activity, sleep-related precautions and awareness of possible physical and psychological effects.

Data analysis: Descriptive statistics were used to summarize socio-demographic characteristics and knowledge and attitude levels. Mean, standard deviation and mean percentage were used for continuous scores. The paired comparison was evaluated using the t statistic reported in the dissertation. Pearson correlation was used to examine the relationship between pre-intervention knowledge and attitude. Chi-square tests were used to examine associations with selected socio-demographic variables.

6. Results

The study included 60 students. The largest age group was 21–23 years (33; 55%), followed by 18–20 years (25; 41.7%) and 24–26 years (2; 3.3%). Females constituted 53 (88.3%) of the sample and males 7 (11.7%). Fifty students (83.3%) belonged to nuclear families. Fifty-five students (91.7%) were enrolled under the management scheme. The most common parental monthly income category was ₹20,001–30,000 (20; 33.3%). Private employment was the most frequently reported parental occupation (27; 45%), and 33 (55%) reported parental education of PUC and above. All 60 students reported that they had not previously come across a similar study. These distributions are reproduced from the dissertation results tables.

6.1 Pre- and Post-Intervention Knowledge

Knowledge level	Pre-intervention n (%)	Post-intervention n (%)
Inadequate	4 (6.67%)	0 (0%)
Average	28 (46.67%)	6 (10%)
Adequate	28 (46.67%)	54 (90%)
Total	60 (100%)	60 (100%)

Before the intervention, 4 (6.67%) students had inadequate knowledge, while 28 (46.67%) each had average and adequate knowledge. Following video-assisted teaching, no participant remained in the inadequate category; 6 (10%) had average knowledge and 54 (90%) had adequate knowledge. Thus, the distribution shifted toward the adequate category after the intervention.

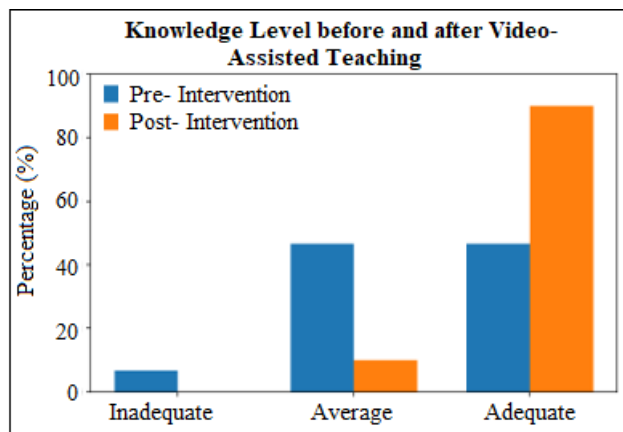


Figure 1: Knowledge level before and after video-assisted teaching

6.2 Pre- and Post-Intervention Attitude

Attitude level	Pre-intervention n (%)	Post-intervention n (%)
Negative	1 (1.67%)	0 (0%)
Neutral	7 (11.67%)	0 (0%)
Positive	52 (86.67%)	60 (100%)
Total	60 (100%)	60 (100%)

Before the intervention, 52 (86.67%) students had a positive attitude, 7 (11.67%) had a neutral attitude and 1 (1.67%) had a negative attitude. After the video-assisted teaching programme, all 60 (100%) students were categorized as having a positive attitude, with no students in the neutral or negative categories.

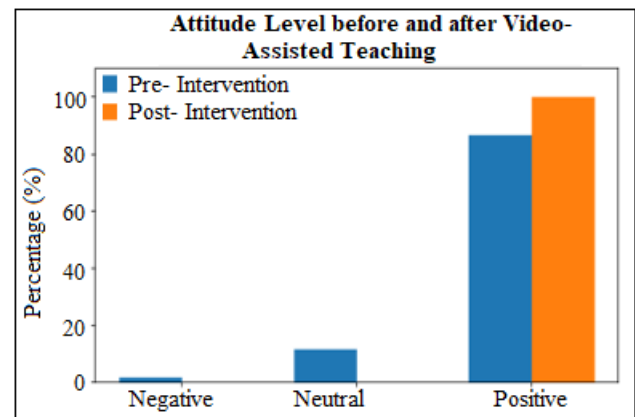


Figure 2: Attitude level before and after video-assisted teaching

6.3 Comparison of Mean Knowledge and Attitude Scores

Variable	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean difference	t value	df
Knowledge	13.88 $\pm$ 2.57	17.32 $\pm$ 1.70	3.44	11.83	59
Attitude	25.62 $\pm$ 2.99	29.78 $\pm$ 0.58	4.16	10.97	59

The mean knowledge score increased from 13.88 (SD 2.57) before the intervention to 17.32 (SD 1.70) after the intervention. The mean difference was 3.44 and the reported t value was 11.83 with 59 degrees of freedom. The dissertation compares this value with a critical value of 2.02 and interprets the difference as statistically significant.

The mean attitude score increased from 25.62 (SD 2.99) before the intervention to 29.78 (SD 0.58) after the intervention. The mean difference was 4.16 and the reported t value was 10.97 with 59 degrees of freedom. The dissertation interprets this result as evidence that the video-assisted teaching programme was effective in enhancing attitude.

6.4 Correlation Between Pre-Intervention Knowledge and Attitude

Variable	Mean	Pearson r
Knowledge	13.88	0.96
Attitude	25.62	

A strong positive correlation was reported between pre-intervention knowledge and attitude scores ($r=0.96$, $n=60$). The dissertation interprets this as a significant positive relationship, indicating that participants with higher baseline knowledge tended to have more favourable baseline attitudes.

6.5 Association with Socio-Demographic Variables

Variable	χ^2	df	p value	Interpretation reported
Age and pre-intervention knowledge	0.85	2	0.65	Not significant
Gender and pre-intervention knowledge	0.004	1	0.9495	Not significant
Current scheme and pre-intervention knowledge	0.75	1	0.385	Not significant
Type of family and pre-intervention knowledge	4.95	1	0.03	Significant
Education of parents and pre-intervention knowledge	1.84	3	0.61	Not significant
Type of family and pre-intervention attitude	3.96	1	0.046	Significant
Education of parents and pre-intervention attitude	8.696	3	0.032	Significant

The dissertation reports a significant association between type of family and pre-intervention knowledge ($\chi^2=4.95$, $df=1$, $p=0.03$). For pre-intervention attitude, significant associations were reported with type of family ($\chi^2=3.96$, $df=1$, $p=0.046$) and education of parents ($\chi^2=8.696$, $df=3$, $p=0.032$). Age, gender and current scheme of study were not significantly associated with the reported baseline knowledge or attitude measures. These findings describe associations within the sample and should not be interpreted as causal relationships.

7. Discussion

The present study examined whether a structured video-assisted teaching programme was followed by improvement in knowledge and attitude regarding overexposure of digital technology among college students. The most important finding was the shift in knowledge distribution: adequate knowledge increased from 46.67% before the intervention to 90% after it, while inadequate knowledge decreased from 6.67% to zero. The mean knowledge score also increased from 13.88 to 17.32. The reported t value of 11.83 was greater than the critical value cited in the dissertation, supporting the study hypothesis regarding change in knowledge.

The attitude findings showed a similar pattern. Although most students already had a positive baseline attitude (86.67%), the intervention was followed by a shift of the entire sample into the positive category. The mean attitude score increased from 25.62 to 29.78, with a reported t value of 10.97. Because baseline positive attitude was already common, the observed change in the categorical distribution should be interpreted together with the mean-score comparison rather than as evidence that every participant had a poor attitude before the programme.

The results are consistent with the direction of evidence summarized in the dissertation literature review. The reviewed studies described relationships between excessive digital-device use and sleep problems, academic distraction, physical discomfort, stress, reduced physical activity and other health concerns. The dissertation also cites an experimental study among degree students in Hassan in which video-assisted teaching on psychological dependence on internet and social networking improved knowledge. [13] Together, these findings provide a rationale for using audiovisual health education to address digital-health awareness.

The strong positive correlation between baseline knowledge and attitude ($r=0.96$) suggests that the two measures were closely related in this sample. However, correlation does not establish that knowledge causes attitude, and the magnitude of the reported coefficient should be interpreted within the characteristics and measurement properties of the study tools.

The association analysis identified type of family as significantly related to both baseline knowledge and baseline attitude, while parental education was significantly related to baseline attitude. Other examined variables were not statistically significant. These findings may be useful for identifying contextual factors when planning student health education, but the sample was limited to one institution and causal explanations cannot be drawn from these cross-sectional associations.

From a nursing perspective, the findings highlight the potential role of nurses and nurse educators in digital-health promotion. Educational interventions can address balanced screen use, sleep hygiene, physical activity, eye and musculoskeletal care, time management, responsible social-media behaviour and recognition of problematic patterns. Video-assisted teaching may be particularly useful when the educational content needs to be standardized and delivered to groups of students.

8. Limitations

- The study used a one-group pre-test post-test design without a control group; therefore, changes cannot be attributed exclusively to the intervention with the same strength as in a randomized controlled design.
- The sample consisted of 60 students from one selected institution in Bengaluru, which limits generalizability to other colleges and youth populations.
- The outcomes were knowledge and attitude scores; the study did not establish whether the intervention produced sustained changes in actual digital-use behaviour.
- The post-test was conducted after a short interval, so long-term retention and behavioural effects were not assessed.
- The study relied on self-reported attitude responses, which may be influenced by social desirability.

9. Nursing Implications

- 1) **Nursing Practice:** Nurses can provide structured digital-health education to adolescents and young adults in community, school and college settings. Health teaching can include recognition of excessive use, healthy screen routines, physical activity, sleep-related precautions, and responsible online behaviour.
- 2) **Nursing Education:** The findings support inclusion of digital-health promotion and technology-related behavioural risks within nursing education. Nurse educators can use short videos, case examples and interactive discussions to teach students how to communicate digital-health messages effectively.
- 3) **Nursing Administration:** Nursing administrators can support standardized audiovisual health-education materials and periodic awareness programmes in educational and community settings. Collaboration between academic institutions and health professionals may help maintain consistent digital-health messaging.
- 4) **Nursing Research:** Future studies can use randomized controlled or controlled quasi-experimental designs, larger samples and follow-up assessments. Research can also examine actual screen-use behaviour, sleep quality, physical activity, academic functioning and psychological well-being rather than knowledge and attitude alone.

10. Recommendations

- Replicate the study with a larger sample across multiple degree colleges in Bengaluru and other regions.
- Use a control group or randomized controlled design to strengthen causal inference.

- Conduct follow-up assessments to determine retention of knowledge and sustainability of attitude changes.
- Evaluate behavioural outcomes such as screen-time patterns, sleep, physical activity and academic concentration.
- Develop institution-wide digital-health education programmes involving students, parents, teachers and health professionals.
- Compare video-assisted teaching with other educational approaches such as interactive workshops, peer education and blended learning.

11. Conclusion

Within the limitations of the study design and sample, the findings indicate that the video-assisted teaching programme was followed by substantial improvement in knowledge and a favourable change in attitude regarding overexposure of digital technology among the participating college students. Adequate knowledge increased from 46.67% to 90%, while the mean knowledge score increased by 3.44 points. Positive attitude increased from 86.67% to 100%, while the mean attitude score increased by 4.16 points. The reported t values for knowledge and attitude exceeded the critical value cited in the dissertation. The study also reported a strong positive correlation between baseline knowledge and attitude and significant associations involving type of family and parental education. The results suggest that structured audiovisual health education can be incorporated into nursing-led digital-health promotion, while further controlled and longer-term research is needed to determine whether improved knowledge and attitude translate into sustained changes in digital-use behaviour.

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Source Note

This manuscript was prepared from the uploaded dissertation, preserving its reported sample, design, intervention, results and bibliography. Minor editorial normalization was applied for journal-style presentation. One table in the dissertation contains an apparent typographical inconsistency where the post-intervention adequate-knowledge frequency of 54 is accompanied by '100%'; the manuscript uses $54/60 = 90\%$, consistent with the detailed post-test table and narrative.