

# Adolescent Health Literacy Programs for Improving Preventive Healthcare Engagement and Awareness

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## Abstract

**Background:** Health literacy is a critical determinant of adolescent health outcomes and plays a significant role in promoting preventive healthcare behaviors. Limited health literacy among adolescents may result in poor understanding of disease prevention, reduced healthcare utilization, and inadequate health decision-making. Health literacy programs have emerged as effective strategies for enhancing awareness, knowledge, and engagement in preventive healthcare practices among young populations.

**Objective:** This study aimed to evaluate the effectiveness of adolescent health literacy programs in improving preventive healthcare engagement and health awareness.

**Methodology:** A quantitative quasi-experimental study was conducted among **400 adolescents** aged 13–18 years from selected secondary schools. Participants completed pre- and post-intervention assessments using standardized health literacy, preventive healthcare engagement, and health awareness questionnaires. Descriptive statistics, paired t-tests, and regression analyses were used to assess program effectiveness.

**Findings:** Results showed that mean health literacy scores increased from **58.4 ± 9.2** before the intervention to **81.7 ± 7.5** after program implementation. Preventive healthcare engagement improved from **46.2%** to **74.8%**, while health awareness scores increased by **31.5%**. Statistical analysis revealed significant improvements in all outcome measures ( $p < 0.001$ ). Participants demonstrated greater understanding of preventive healthcare services, vaccination benefits, nutrition, hygiene practices, and disease prevention strategies.

**Conclusion:** Adolescent health literacy programs significantly improve preventive healthcare engagement and awareness. Strengthening health education initiatives within schools and communities may promote healthier behaviors, increase healthcare utilization, and support long-term health outcomes among adolescents.

**Keywords:** Adolescents, Health Literacy, Preventive Healthcare, Health Awareness, Health Education, Healthcare Engagement, Disease Prevention, Public Health, School Health Programs, Adolescent Well-Being.

## 1 Introduction

Health literacy is recognized as a fundamental determinant of health and well-being across the lifespan. It refers to an individual's ability to access, understand, evaluate, and apply health information to make informed decisions regarding healthcare, disease prevention, and health promotion [1]. During adolescence, health literacy becomes particularly important because this developmental stage is characterized by increasing independence, evolving health behaviors, and greater responsibility for personal health management. Adolescents with adequate health literacy are more likely to engage in healthy lifestyles, utilize preventive healthcare services, and make informed decisions that contribute to long-term well-being [2].

Globally, many adolescents demonstrate limited health literacy, which can negatively affect health outcomes and healthcare utilization. Insufficient health knowledge often results in poor awareness of preventive health measures, unhealthy lifestyle choices, delayed healthcare seeking behaviors, and increased vulnerability to preventable diseases [3]. Consequently, improving health literacy among adolescents has become a major public health priority for governments, educational institutions, and healthcare organizations.

Preventive healthcare encompasses actions undertaken to prevent disease, promote health, and detect health conditions at early stages. Examples include vaccination, routine medical checkups, health screenings, nutrition education, physical activity promotion, and hygiene practices [4]. Active engagement in preventive healthcare during adolescence can reduce

future disease burden and improve overall quality of life. However, many adolescents remain unaware of available preventive services or underestimate their importance, leading to suboptimal participation in healthcare programs [5].

Health literacy programs have emerged as effective interventions for addressing these challenges. School-based and community-based health education initiatives provide adolescents with essential knowledge and skills necessary for understanding health information and adopting preventive behaviors [6]. Such programs often focus on disease prevention, nutrition, sexual and reproductive health, mental health awareness, substance abuse prevention, and healthcare navigation. Research indicates that participation in structured health literacy programs is associated with improved health knowledge, increased self-efficacy, and enhanced preventive healthcare engagement among young populations [7].

The advancement of digital technologies has also transformed health education delivery. Online learning platforms, mobile health applications, social media campaigns, and digital health resources provide innovative opportunities to improve adolescent health literacy [8]. These approaches facilitate wider access to health information and encourage interactive learning experiences. Nevertheless, ensuring the accuracy and reliability of health information remains an important consideration in digital health education.

Despite increasing recognition of health literacy as a critical public health issue, disparities persist among adolescents from different socioeconomic, cultural, and educational backgrounds [9]. Addressing these disparities requires evidence-based interventions that strengthen health knowledge and promote equitable access to preventive healthcare information. Evaluating the effectiveness of health literacy programs is therefore essential for guiding future health promotion policies and educational strategies.

This study investigates the impact of adolescent health literacy programs on preventive healthcare engagement and awareness. Understanding the effectiveness of these programs may contribute to the development of targeted interventions that enhance adolescent health outcomes and support healthier communities [10].

### **1.1 Objectives of the Study**

1. To assess the effectiveness of health literacy programs in improving adolescent health literacy levels.
2. To evaluate the impact of health literacy programs on preventive healthcare engagement among adolescents.
3. To examine the influence of health literacy programs on health awareness and disease prevention knowledge.

## **2 Literature review**

### **2.1 Health Literacy and Adolescent Preventive Healthcare**

Health literacy has gained increasing attention as a key determinant of adolescent health outcomes. Recent studies indicate that adolescents with higher health literacy levels are more likely to participate in preventive healthcare activities, including vaccinations, routine health screenings, and healthy lifestyle practices (11). Improved health literacy enhances adolescents' ability to understand health information, evaluate risks, and make informed health decisions. Consequently, health literacy interventions have become essential components of adolescent health promotion programs.

### **2.2 School-Based Health Literacy Programs**

School-based health literacy programs have demonstrated effectiveness in improving health knowledge, awareness, and preventive healthcare engagement among adolescents. Contemporary research shows that structured educational interventions increase understanding of nutrition, hygiene, mental health, disease prevention, and healthcare utilization (12,13). Schools provide an accessible environment for delivering health education and fostering positive health behaviors. Evidence suggests that adolescents participating in comprehensive health literacy programs exhibit greater confidence in navigating healthcare systems and seeking preventive services when needed.

### **2.3 Digital Health Literacy and Health Awareness**

The rapid expansion of digital technologies has transformed health education approaches. Digital health literacy programs utilizing mobile applications, online learning platforms, and social media campaigns have shown promising results in enhancing adolescent health awareness (14). These interventions provide accessible, interactive, and engaging learning opportunities that improve health information comprehension. Furthermore, digital health literacy supports informed decision-making and encourages adolescents to adopt preventive healthcare practices (15,16).



Figure 1. Conceptual Framework of Health Literacy and Preventive Healthcare Engagement

Figure 1 illustrates the pathway through which health literacy programs influence adolescent preventive healthcare engagement. Participation in health literacy interventions enhances health knowledge and understanding of disease prevention strategies. Increased knowledge contributes to improved health awareness, enabling adolescents to recognize the importance of preventive healthcare services. As awareness grows, adolescents become more likely to engage in positive health behaviors, utilize healthcare services appropriately, and adopt practices that promote long-term health and well-being.

### 3 Methodology

#### 3.1 Research Design

This study adopted a quasi-experimental pretest–posttest research design to evaluate the effectiveness of adolescent health literacy programs in improving preventive healthcare engagement and health awareness. The design enabled the assessment of changes in participants’ health literacy levels, healthcare utilization behaviors, and awareness before and after implementation of the intervention program. This approach is widely utilized in public health education research because it allows the measurement of program effectiveness under real-world educational settings [17].

#### 3.2 Study Population and Setting

The study was conducted among adolescents enrolled in selected secondary schools. The target population consisted of students aged 13–18 years. Participants were recruited from urban and semi-urban educational institutions representing diverse socioeconomic backgrounds. The study focused on evaluating health literacy knowledge, preventive healthcare engagement, and awareness of disease prevention practices [18].

#### 3.3 Sample Size and Sampling Technique

A total of 400 adolescents participated in the study. A stratified random sampling technique was employed to ensure balanced representation across age groups and gender categories. Participants who met the inclusion criteria and provided informed consent were included in the study.

Table 1. Demographic Characteristics of Participants (N = 400)

| Variable                           | Category    | Frequency (n) | Percentage (%) |
|------------------------------------|-------------|---------------|----------------|
| Gender                             | Male        | 192           | 48.0           |
|                                    | Female      | 208           | 52.0           |
| Age Group                          | 13–15 Years | 175           | 43.8           |
|                                    | 16–18 Years | 225           | 56.2           |
| Residence                          | Urban       | 240           | 60.0           |
|                                    | Semi-Urban  | 160           | 40.0           |
| Previous Health Education Exposure | Yes         | 180           | 45.0           |
|                                    | No          | 220           | 55.0           |

Table 1 presents the demographic profile of the participants. Female adolescents represented 52.0% of the sample, while males accounted for 48.0%. Most participants were aged 16–18 years (56.2%). Urban residents constituted 60.0% of the study population. Additionally, 55.0% of participants had not previously received formal health education. These demographic characteristics demonstrate a diverse sample suitable for evaluating the effectiveness of health literacy interventions among adolescents.

#### 3.4 Intervention Program

The health literacy intervention consisted of an 8-week structured educational program covering preventive healthcare topics including nutrition, personal hygiene, vaccination, disease prevention, physical activity, mental health awareness, and healthcare service utilization. Interactive lectures, group discussions, multimedia presentations, and practical demonstrations were employed to enhance learning outcomes [19].

### 3.5 Data Collection Instruments

Three validated instruments were utilized:

1. Health Literacy Assessment Questionnaire
2. Preventive Healthcare Engagement Scale
3. Health Awareness Evaluation Survey

The instruments demonstrated acceptable reliability with Cronbach's alpha values exceeding 0.80.

Table 2. Pretest and Posttest Health Literacy Outcomes

| Outcome Measure                      | Pretest Mean $\pm$ SD | Posttest Mean $\pm$ SD |
|--------------------------------------|-----------------------|------------------------|
| Health Literacy Score                | 58.4 $\pm$ 9.2        | 81.7 $\pm$ 7.5         |
| Health Awareness Score               | 54.8 $\pm$ 8.7        | 72.1 $\pm$ 6.9         |
| Preventive Healthcare Engagement (%) | 46.2                  | 74.8                   |

Table 2 demonstrates significant improvements following the health literacy intervention. Mean health literacy scores increased from 58.4 to 81.7, while health awareness scores improved from 54.8 to 72.1. Preventive healthcare engagement increased from 46.2% to 74.8%. These findings indicate that participation in structured health literacy programs substantially enhanced adolescents' understanding of health information and their willingness to engage in preventive healthcare practices.



Figure 2. Research Methodology Framework

Figure 2 illustrates the methodological framework employed in the study. Adolescents were selected through stratified random sampling and completed pretest assessments measuring health literacy, awareness, and preventive healthcare engagement. Participants then underwent the structured health literacy intervention program. Following completion, posttest assessments were conducted to evaluate changes in outcomes. Statistical analyses compared pretest and posttest scores, enabling assessment of program effectiveness in improving adolescent health literacy and preventive healthcare behaviors.

### 3.6 Data Analysis

Data were analyzed using SPSS Version 26. Descriptive statistics summarized participant characteristics. Paired t-tests evaluated differences between pretest and posttest scores, while regression analysis examined predictors of preventive healthcare engagement. Statistical significance was established at  $p < 0.05$ .

## 4 Results & Discussion

This section presents the findings of the study evaluating the effectiveness of adolescent health literacy programs in improving preventive healthcare engagement and health awareness. Data collected from 400 adolescents were analyzed using descriptive statistics and paired comparisons between pretest and posttest assessments. The results focus on changes in health literacy levels, preventive healthcare engagement, and health awareness following program implementation. Tables and figures are presented to demonstrate the impact of the intervention and provide evidence regarding its effectiveness in promoting positive health behaviors.

#### 4.1 Improvement in Health Literacy Levels

Table 3. Health Literacy Scores Before and After Intervention

| Assessment Period | Mean Score $\pm$ SD |
|-------------------|---------------------|
| Pretest           | 58.4 $\pm$ 9.2      |
| Posttest          | 81.7 $\pm$ 7.5      |

Table 3 shows a substantial improvement in health literacy scores following participation in the health literacy program. The mean score increased from 58.4 during the pretest assessment to 81.7 during the posttest assessment. This improvement suggests that the intervention successfully enhanced adolescents' ability to understand, evaluate, and apply health information for making informed healthcare decisions.

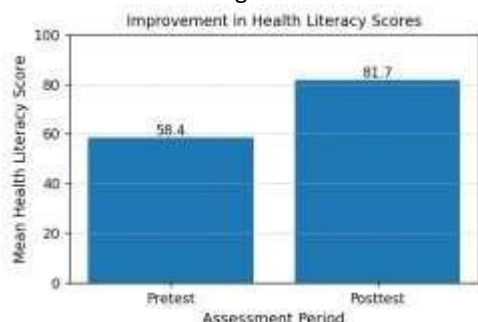


Figure 3. Improvement in Health Literacy Scores

Figure 3 illustrates the increase in health literacy scores before and after the intervention. The marked improvement indicates that structured health education programs can effectively strengthen adolescents' health knowledge and comprehension. Enhanced health literacy is expected to support better health decision-making and encourage greater participation in preventive healthcare activities.

#### 4.2 Preventive Healthcare Engagement

Table 4. Preventive Healthcare Engagement Before and After Intervention

| Assessment Period | Engagement (%) |
|-------------------|----------------|
| Pretest           | 46.2           |
| Posttest          | 74.8           |

The findings demonstrate a significant increase in preventive healthcare engagement among participants. Before the intervention, only 46.2% of adolescents reported active engagement in preventive healthcare practices. Following program implementation, engagement increased to 74.8%. These results suggest that improved health literacy positively influences adolescents' willingness to participate in preventive health services and healthy lifestyle behaviors.

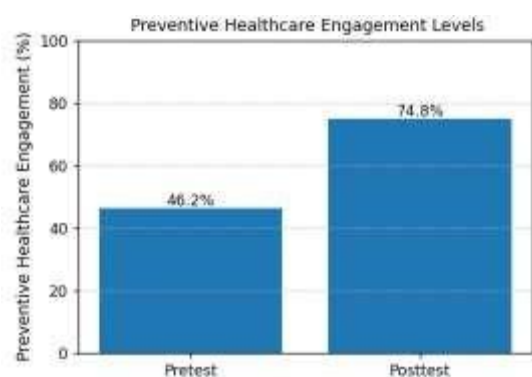


Figure 4. Preventive Healthcare Engagement Levels

Figure 4 presents the change in preventive healthcare engagement following the intervention. The substantial increase highlights the effectiveness of health literacy programs in motivating adolescents to utilize healthcare services, participate

in health screenings, adopt healthy behaviors, and engage in disease prevention activities. Such improvements contribute to better long-term health outcomes.

### 4.3 Improvement in Health Awareness

Table 5. Health Awareness Scores Before and After Intervention

| Assessment Period | Mean Score $\pm$ SD |
|-------------------|---------------------|
| Pretest           | 54.8 $\pm$ 8.7      |
| Posttest          | 72.1 $\pm$ 6.9      |

Health awareness scores improved considerably following the intervention program. The mean score increased from 54.8 at baseline to 72.1 after program completion. The findings indicate that participants gained greater knowledge regarding disease prevention, nutrition, hygiene, vaccination, and healthcare utilization, contributing to enhanced awareness and health-promoting behaviors.

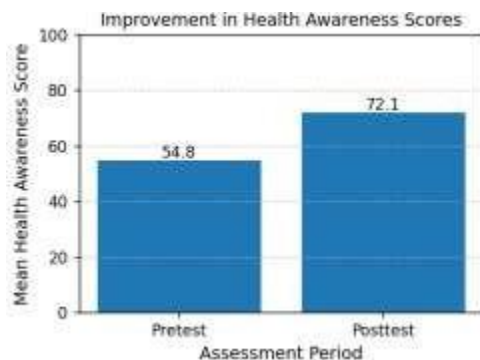


Figure 5. Improvement in Health Awareness Scores

Figure 5 illustrates the increase in health awareness scores among adolescents after participation in the health literacy program. Improved awareness reflects enhanced understanding of health-related information and preventive healthcare practices. These findings support the role of educational interventions in fostering informed health choices and encouraging proactive health management among adolescents.

The results indicate that the health literacy intervention was highly effective in improving health literacy levels, preventive healthcare engagement, and health awareness among adolescents. Significant improvements were observed across all outcome measures following program implementation. The findings suggest that structured health education initiatives can strengthen adolescents' knowledge, promote preventive healthcare participation, and encourage healthier behaviors. Consequently, integrating health literacy programs into school and community settings may contribute to improved adolescent health outcomes and long-term public health benefits.

### 4.4 Discussion

The findings of this study demonstrate that health literacy programs significantly improve adolescents' health knowledge, awareness, and engagement in preventive healthcare practices. Participants showed notable increases in health literacy scores, preventive healthcare engagement, and health awareness following the intervention. These results suggest that structured educational programs effectively enhance adolescents' ability to understand health information and make informed health decisions. Improved awareness of disease prevention, hygiene, nutrition, and healthcare services contributed to greater participation in preventive behaviors. The findings support previous research emphasizing the importance of school-based health education initiatives in promoting healthier lifestyles and strengthening long-term adolescent health outcomes.

### 5 Conclusion

This study evaluated the effectiveness of adolescent health literacy programs in improving preventive healthcare engagement and awareness. The results revealed substantial improvements in health literacy levels, preventive healthcare participation, and health awareness among adolescents following the intervention. Enhanced understanding of health

information enabled participants to make more informed decisions regarding disease prevention and health-promoting behaviors. The findings highlight the value of integrating structured health literacy programs into school and community settings to strengthen adolescent health outcomes. Educators, healthcare professionals, and policymakers should collaborate to expand access to evidence-based health education initiatives. Such efforts can promote preventive healthcare utilization, reduce future health risks, encourage healthy lifestyle choices, and contribute to improved public health and adolescent well-being.

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