Analysis Report: Indian Kids Screen Time

1. Dataset Overview

The dataset consists of 9712 records with the following features:
- Age: Age of the child
- Gender: Gender of the child
- Avg_Daily_Screen_Time_hr: Average daily screen time in hours
- Primary_Device: Primary device used
- Exceeded_Recommended_Limit: Whether screen time exceeds recommended limit
- Educational_to_Recreational_Ratio: Ratio of educational to recreational usage
- Health_Impacts: Reported health impacts
- Urban_or_Rural: Urban or rural residence

Missing values were mainly in the Health_Impacts column (3218 entries). After filling missing values with the mode, all columns became complete.

2. Data Exploration

Numerical Columns:
- Average daily screen time: Mean = 4.35 hrs, Std = 1.72 hrs
- Age distribution: 8-18 years, median age: 13 years
- Educational-to-recreational ratio: Mean = 0.427, fairly consistent

Categorical Columns:
- Gender: Balanced distribution
- Primary device: Most kids use Smartphones, followed by TV and Laptop
- Urban or Rural: Slightly more urban participants

3. Visual Insights

Gender & Device Usage:
- Females tend to prefer Laptops, males prefer Smartphones

Screen Time Trends:
- Average screen time increases slightly with age
- Most children use devices 4-5 hours daily, exceeding recommended limits

Health Impacts:
- Major health issues include Poor Sleep, Eye Strain, and Anxiety
- Eye Strain + Anxiety category had the highest average daily screen time (~5.08 hrs)
- Females are slightly more affected by anxiety and eye strain

Urban vs Rural:

- Urban children are more likely to exceed recommended screen time, especially females

Correlation:
- Avg_Daily_Screen_Time_hr has the highest correlation with Exceeded_Recommended_Limit
- Other numerical features have weaker correlations

4. Feature Engineering

Created a custom index: screenEduRecExceedIndex = Avg_Daily_Screen_Time_hr / Educational_to_Recreational_Ratio
Median threshold (10.69) used to approximate screen time exceeding limits
Dropped imbalanced predicted column to prevent bias

5. Distribution and Patterns

Most children's screen time falls in 4-6 hrs/day
Multiple health impacts occur with higher screen time (>5 hrs)
Females slightly exceed males in screen time and report more health impacts
Smartphone usage dominates both genders, with TV as secondary

6. Preprocessing for Modeling

Missing values filled
Categorical features: One-Hot Encoded
Numerical features: Standard Scaled
Resulting transformed dataset contains 22 columns, ready for ML modeling

7. Key Insights

Average screen time: 4.35 hrs/day; high screen usage is common
Highest risk group: Children with Eye Strain + Anxiety
Gender trend: Females slightly overuse devices compared to males
Urban areas: Children more likely to exceed recommended screen time
Device usage: Smartphone is the primary device
Correlations: Avg_Daily_Screen_Time_hr strongly impacts exceeding recommended limits

8. Recommendations

Limit daily screen time to under 4-5 hrs for healthy development
Promote educational vs recreational balance
Parents should monitor device usage, especially Smartphones in urban females
Awareness campaigns about eye strain, anxiety, and sleep issues are recommended