ScreenSense: Kids' Screentime Visualization

Milestone 2: Visual Exploration and Topic Trends

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Week 3: Univariate and Bivariate Visual Analysis

Week 4: Device/Activity and Weekday/Weekend Analysis

1. Creating the Day_Type Column

I added a new column called Day_Type to classify users based on their screen time.
If a child had High or Very High screen time, I labelled them as Weekend, and if they had Low or Moderate screen time, I labelled them as Weekday.
This helped me compare screen usage patterns between weekdays and weekends.

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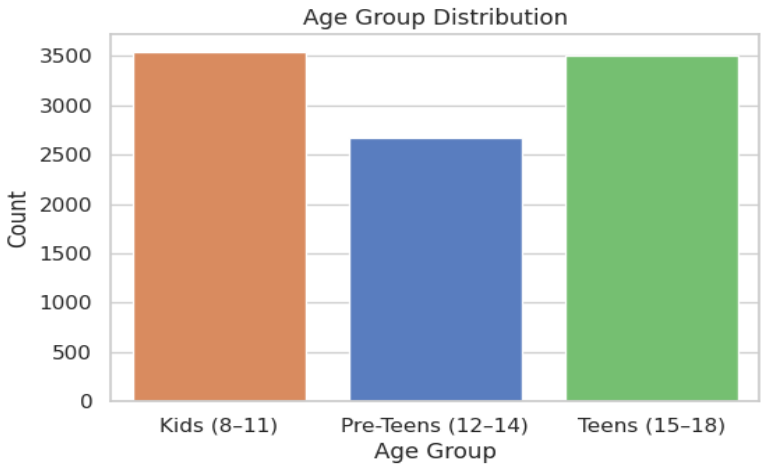
2. Univariate Analysis

1. Age Group Distribution:



I observed that the dataset contains more kids (8–11) and teens (15–18) compared to pre-teens (12–14), showing higher participation from the younger and older age groups.

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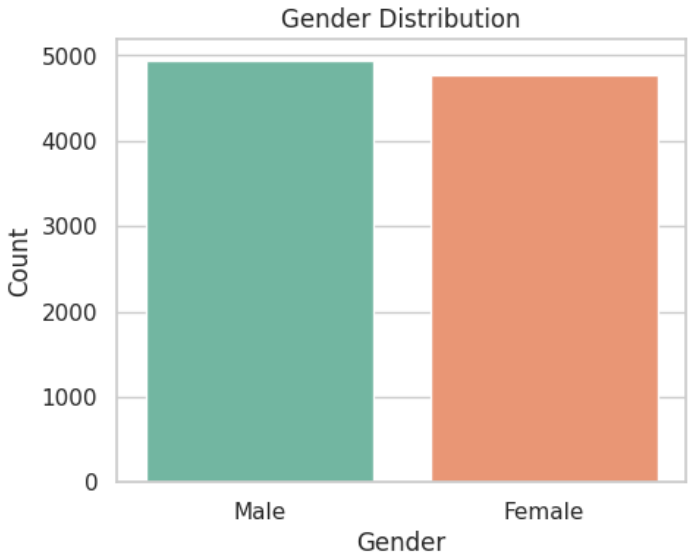
2. Gender Distribution



I observed that the number of male and female users is almost equal, indicating a balanced representation across genders.

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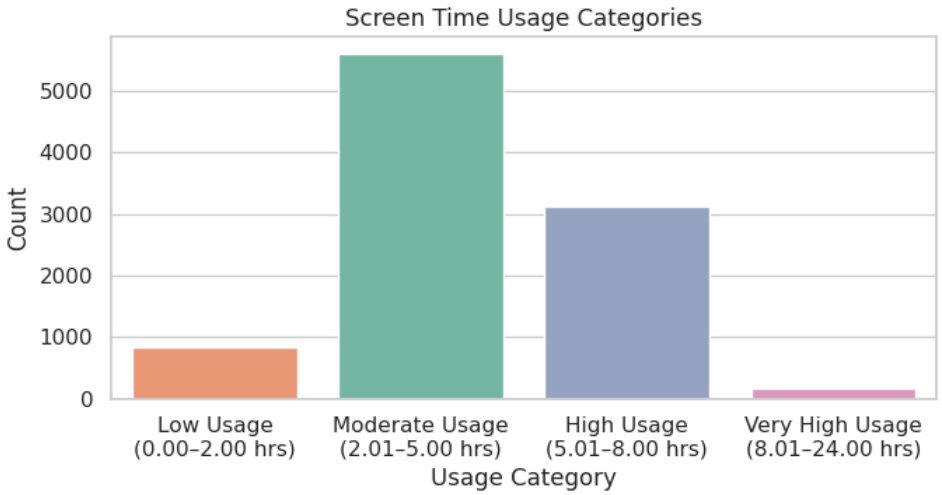
3. Screen Time Usage Categories:



I observed that most users fall under the moderate usage (2–5 hours) category, while only a few users have very high screen time.

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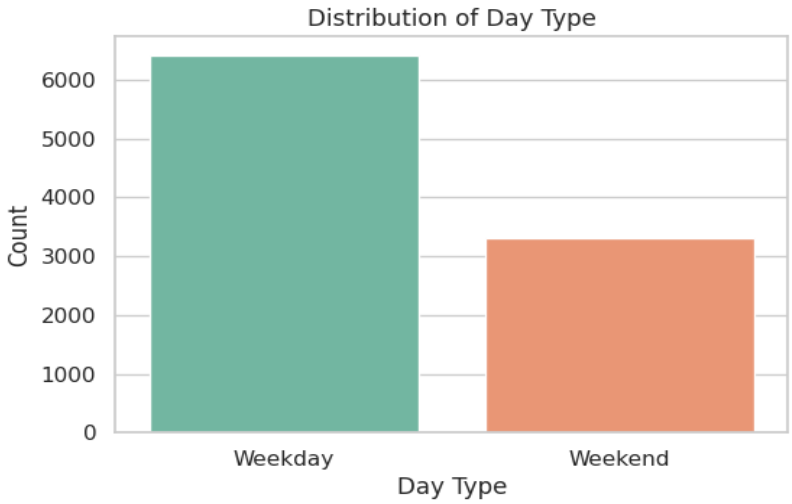
4. Distribution of Day Type:



I observed that the screen time data is more frequent on weekdays compared to weekends, suggesting that digital usage continues actively throughout the school or work week.

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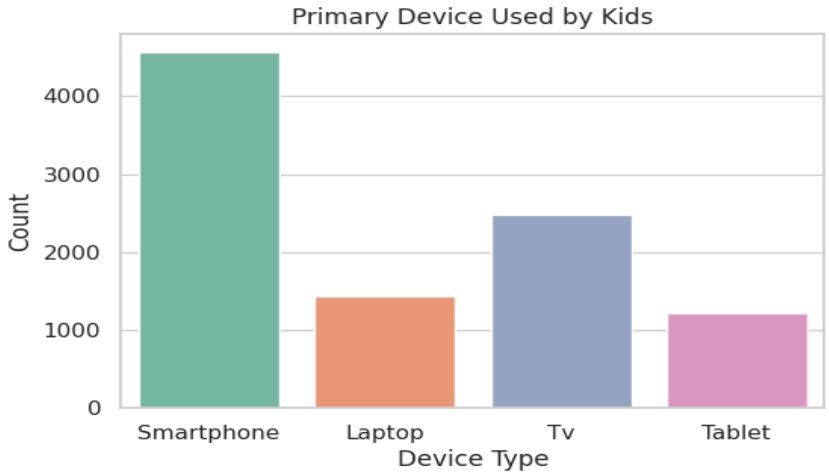
5. Device Type Usage



I observed that Smartphones are the most commonly used devices among users, followed by TVs and laptops, while tablets are the least used.

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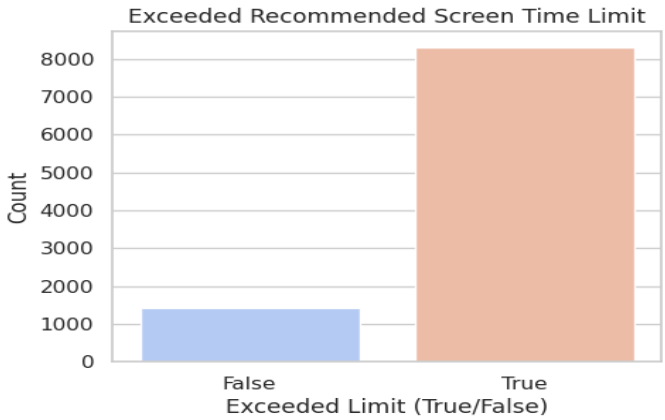
6. Exceeded Recommended Screen Time Limit:



I observed that a majority of users have exceeded the recommended screen time limit, which indicates a potential concern for excessive device usage.

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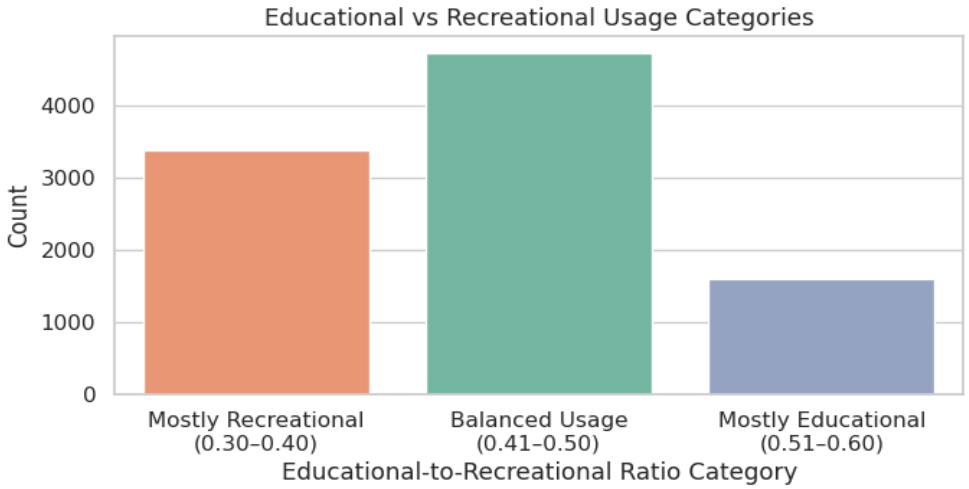
7. Educational vs Recreational Usage Categories:



I observed that most users have a balanced usage pattern between educational and recreational activities, while fewer users are mostly recreational or mostly educational.

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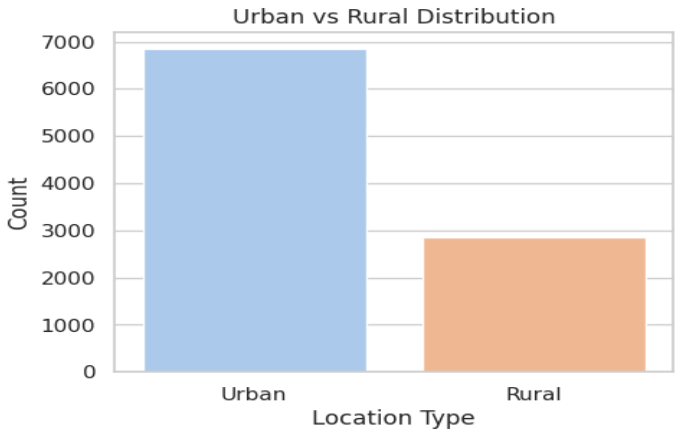
8. Urban vs Rural Distribution:



I observed that a larger portion of users belong to urban areas, showing that screen time data is more concentrated in cities than in rural regions.

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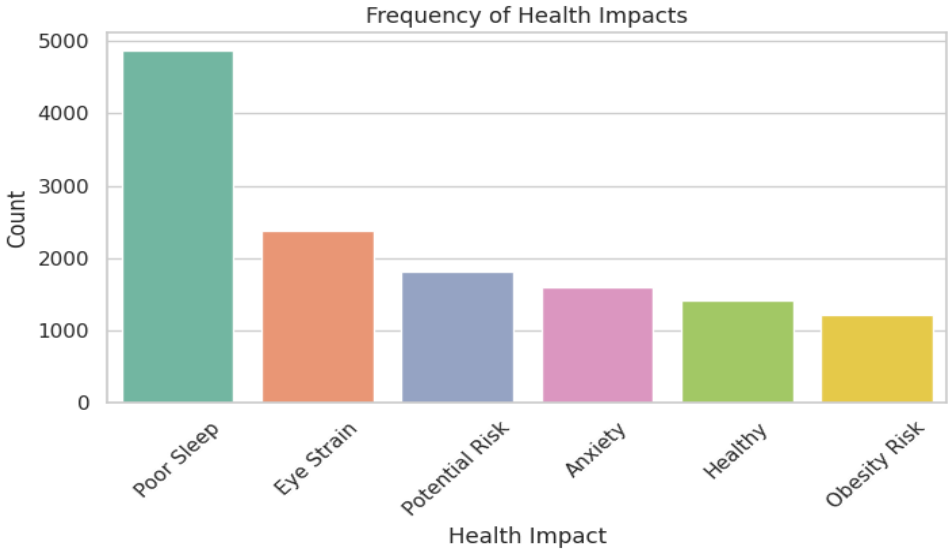
9. Health Impact Frequency:



I observed that poor sleep is the most common health impact associated with high screen time, followed by eye strain and potential risk. Fewer users reported issues like anxiety and obesity risk, while only a small portion appeared healthy, highlighting that excessive screen time may have notable negative effects on sleep and eye health.

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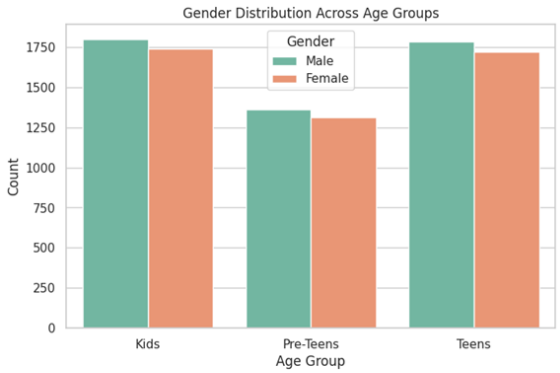
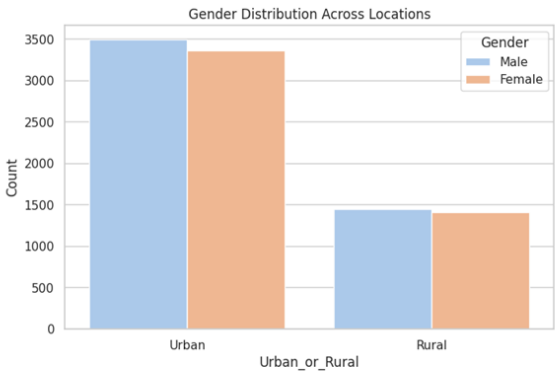
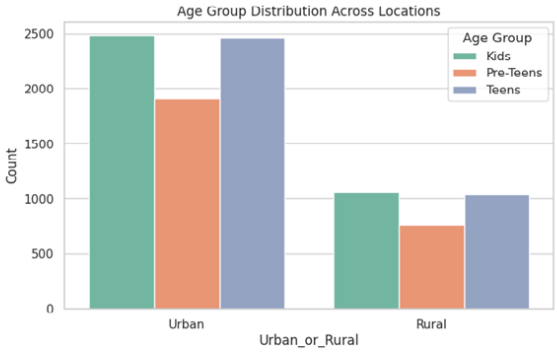
3. Bivariate Analysis

1. Demographic Relationship Analysis







(a) **Gender Distribution Across Age Groups:**
I observed that both boys and girls are evenly distributed across all age groups, indicating a balanced sample representation.

(b) **Gender Distribution Across Locations:**
I observed that in urban areas, both genders are almost equally represented, while rural participation is relatively lower for both male and female users.

(c) **Age Group Distribution Across Locations:**
I observed that the distribution among age groups is relatively similar, with kids and teens using digital devices more than pre-teens. However, rural areas have relatively fewer children compared to urban areas.

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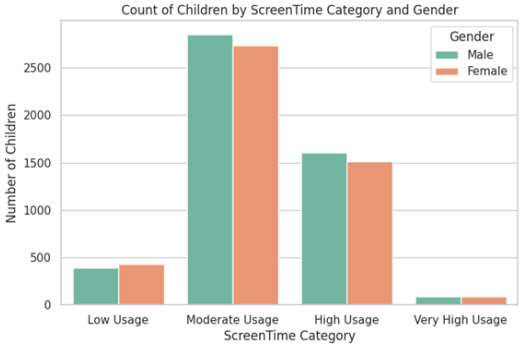
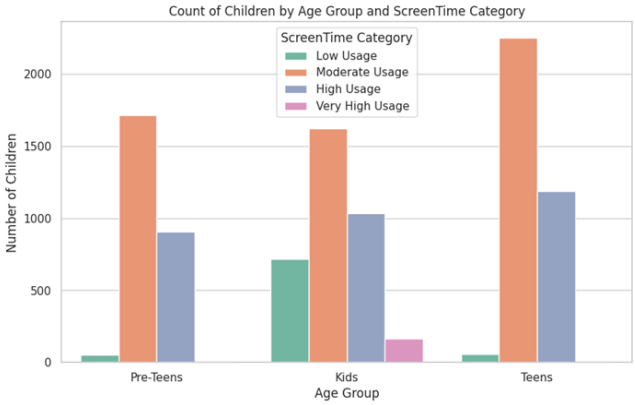
2. Screentime Analysis



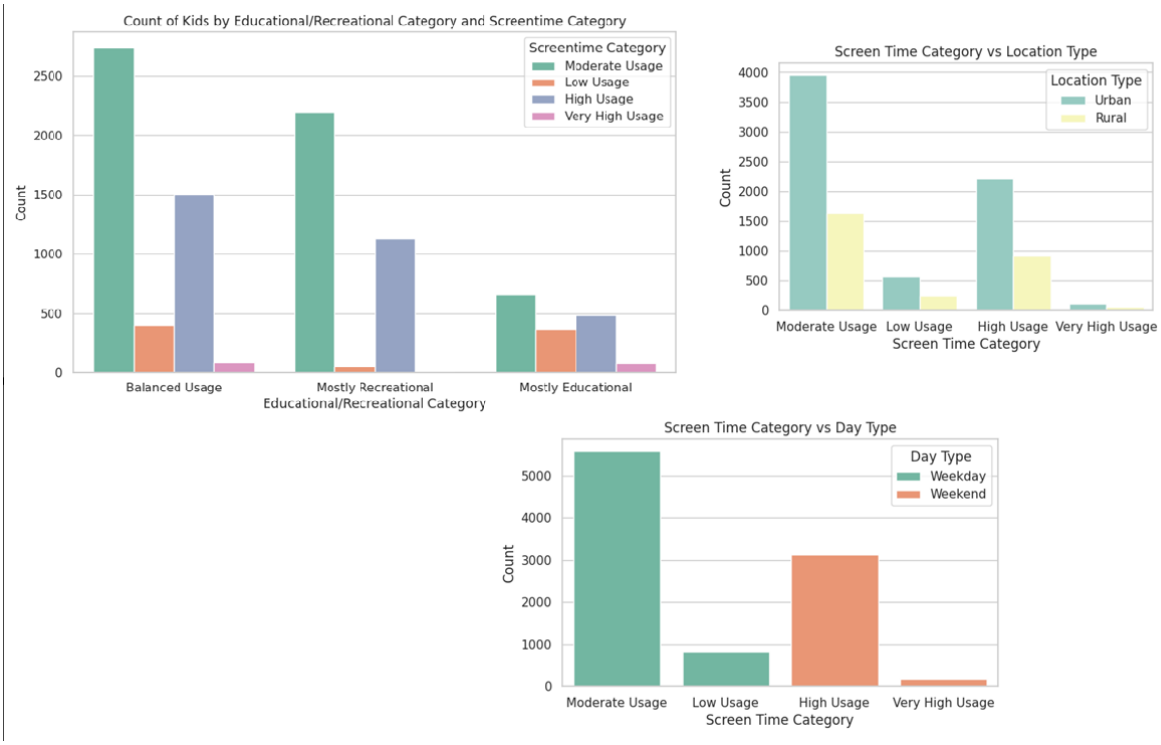


(a) Count of Children by ScreenTime Category and Gender

- Most children fall under the Moderate Usage category for both genders.
- Males slightly outnumber females in every category except Low Usage, where counts are nearly equal.
- Very few children belong to the Very High Usage category overall.

(b) Count of Children by Age Group and ScreenTime Category

- Across all age groups, Moderate Usage is the most common.
- Teens show the highest screen time, with many in Moderate and High Usage levels.
- Pre-teens and Kids have fewer children in the High and Very High Usage categories, indicating that screen time tends to increase with age.



(c) Count of children by Educational/Recreational Category and Screentime

- Most kids show Balanced Usage with mainly Moderate screen time.
- Mostly Recreational kids show moderate to high usage.
- Balanced and recreational users spend more time on screens than educational users.

(d) Count of children by Screentime and Location (Urban vs Rural)

- Urban kids have higher moderate and high usage.
- Rural kids show more low usage.

(e) Count of children by Screentime and Day Type (Weekday vs Weekend)

- Moderate usage is higher on weekdays.

- High usage increases on weekends.

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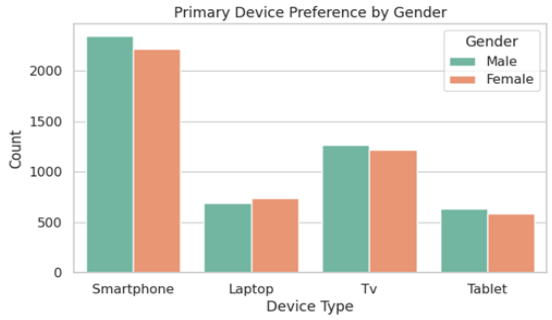
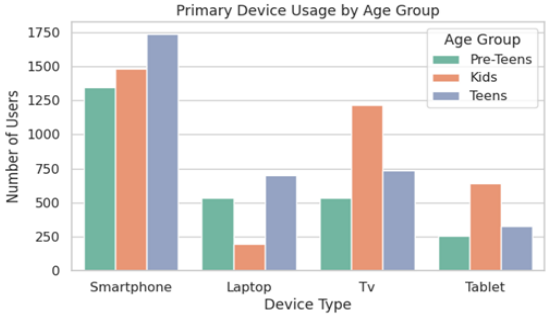
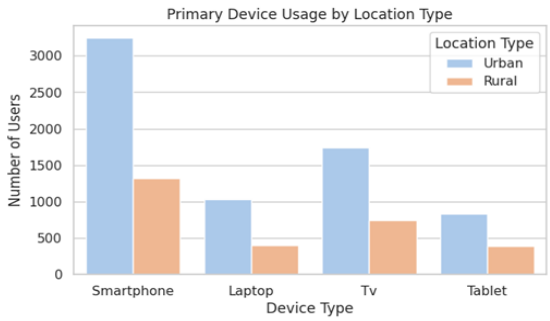
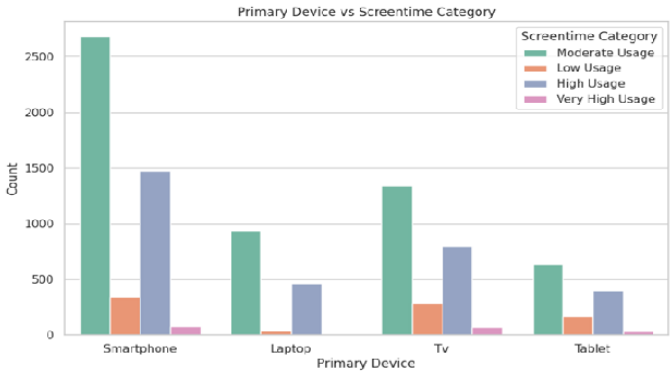
3. Device Analysis









(a) Count of children by Primary Device Preference and Gender

- Smartphones are the most used device for both boys and girls.
- TV is the second most used device.
- Laptops and tablets are used much less by both genders.

(b) Count of children by Primary Device Usage and Age Group

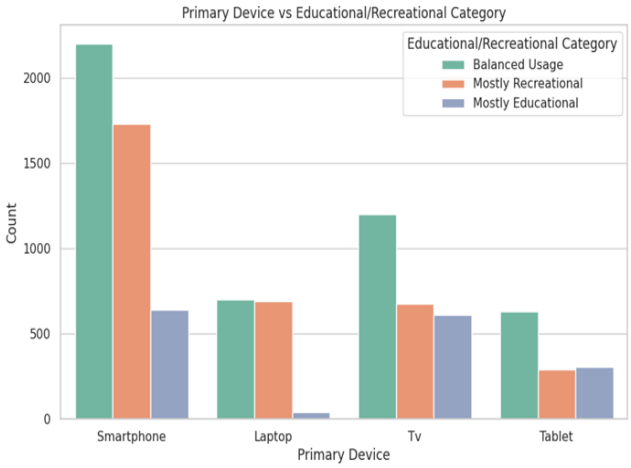
- Teens use smartphones the most.
- Kids mostly use smartphones and TVs.
- Pre-teens show balanced usage across TVs, and laptops, with low laptop use.

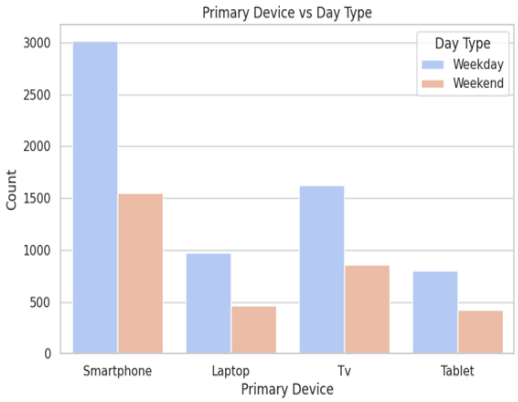
(c) Count of children by Primary Device Usage and Location Type

- Urban children use smartphones and TVs more than rural children.
- Rural children show less overall device usage, especially laptops and tablets.

(d) Count of children by Primary Device and Screentime Category

- Moderate users mostly use smartphones, followed by TVs.
- High users mainly use TVs and smartphones.
- Very high usage is low overall but highest among smartphone users.





(e) Count of children by Primary Device and Educational/Recreational Category

- Smartphones are the most commonly used device across all categories.
- Balanced users show the highest smartphone and TV usage.
- Mostly recreational users also use smartphones heavily.
- Mostly educational users prefer smartphones and laptops, with very low TV usage.

(f) Count of children by Primary Device and Day Type (Weekday vs Weekend)

- Smartphone and TV use is higher on weekdays than weekends.
- Laptop and tablet use is also higher on weekdays, but the difference is smaller.

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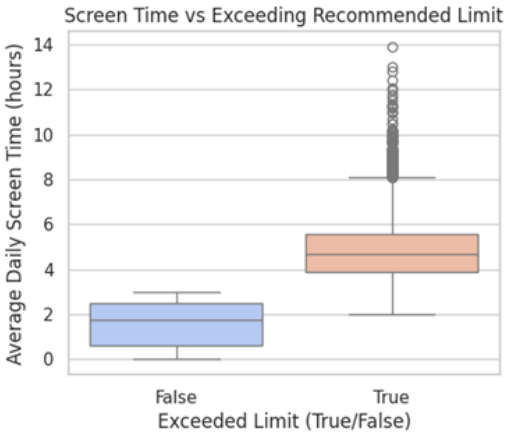
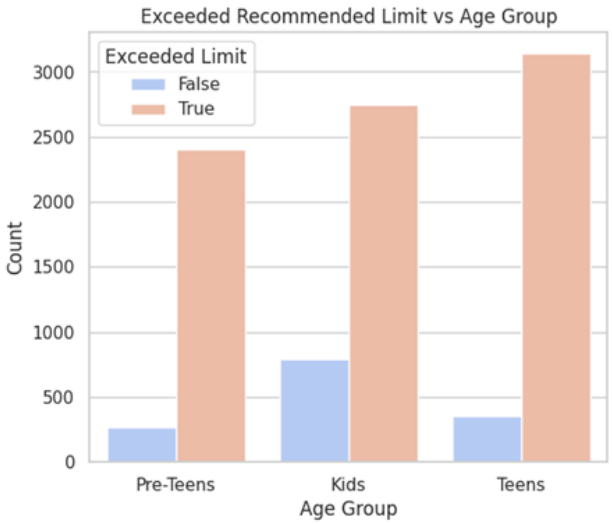
4. Exceeded Limit Analysis



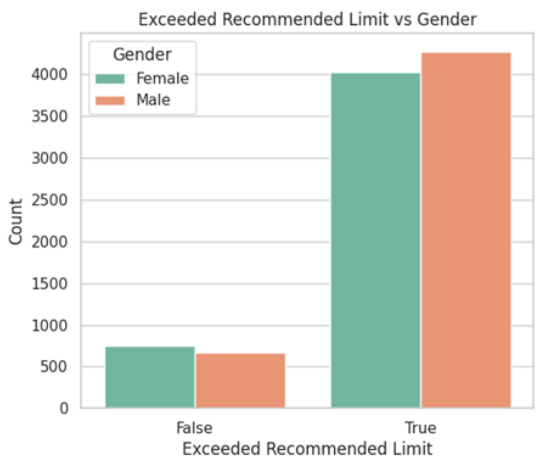


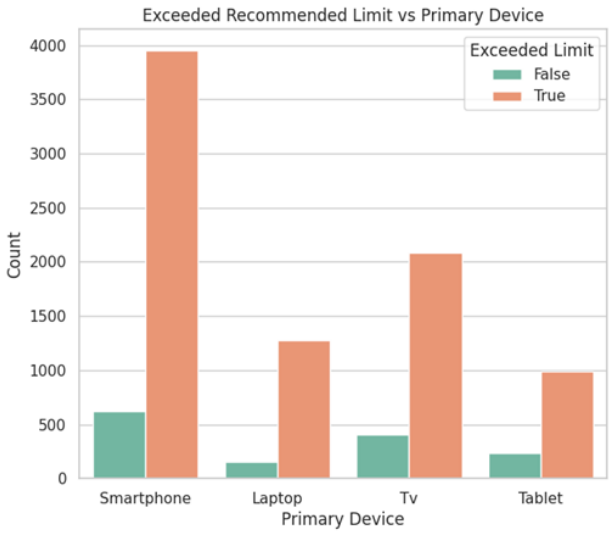
(a) Screen Time vs Exceeding Recommended Limit

- Children who exceeded the recommended limit spend much more time on screens.
- Those within the limit use screens for only about 2–3 hours daily, while those exceeding often go above 5 hours.

(b) Count of children by Exceeded Recommended Limit and Age Group

- Teens are most likely to exceed the recommended screen time.
- Kids also exceed the limit frequently, but less than teens.
- Pre-teens exceed the limit the least.



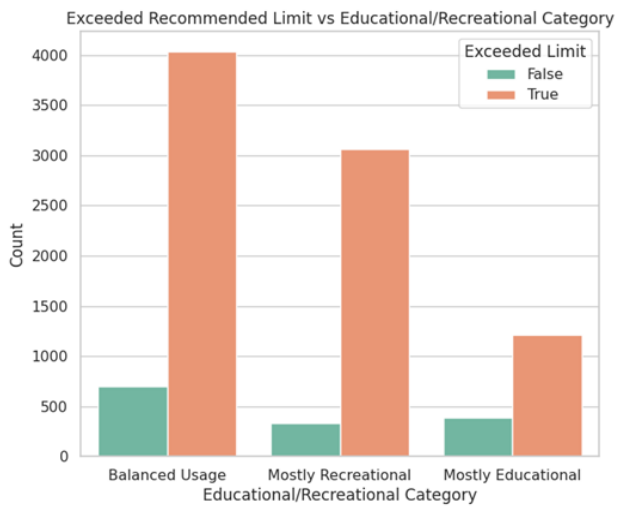


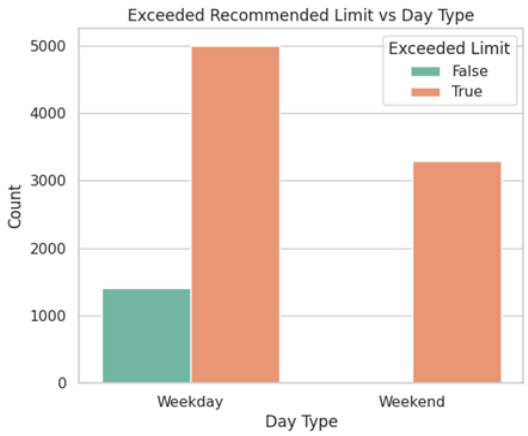
(c) Count of children by Exceeded Recommended Limit and Gender

- Most boys and girls exceed the recommended screen time.
- The number of boys exceeding the limit is slightly higher than girls.

(d) Count of children by Exceeded Recommended Limit and Primary Device

- Smartphone users are the most likely to exceed screen limits.
- TV users also exceed the limit frequently.





(e) Count of children by Exceeded Recommended Limit and Educational/Recreational Category

• Users with balanced usage and mostly recreational usage exceed the recommended screen

time more often.

• Those with mostly educational usage exceed the limit less frequently.

(f) Count of children by Exceeded Recommended Limit and Day Type

• More users exceed the recommended limit on *weekdays* than on *weekends*.

• Fewer users stay within limits during weekdays.

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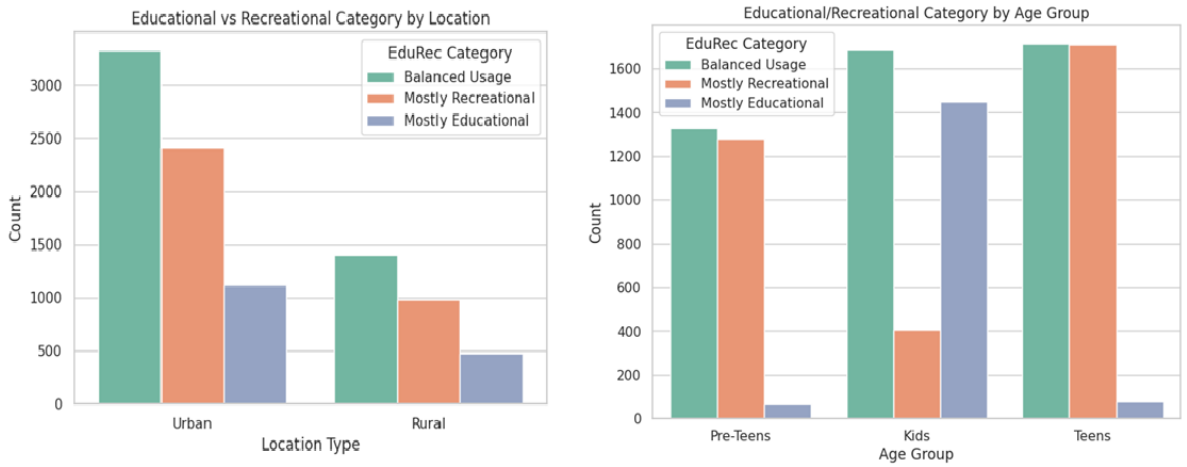
5. Activity & Educational Category Analysis



(a) Count of children by Educational to Recreational Category and Location

• Urban users mostly show balanced and recreational usage patterns.

• Rural users have fewer counts overall but still show mainly balanced usage.

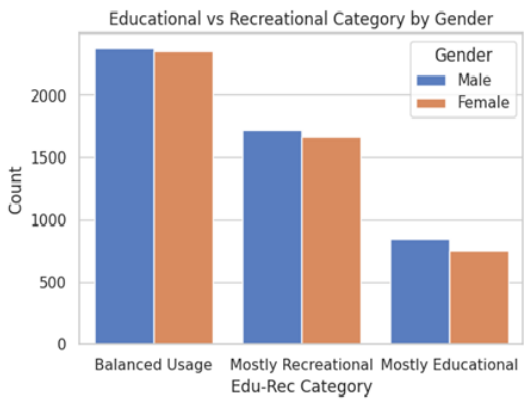
• Mostly educational usage is the least common in both urban and rural areas.

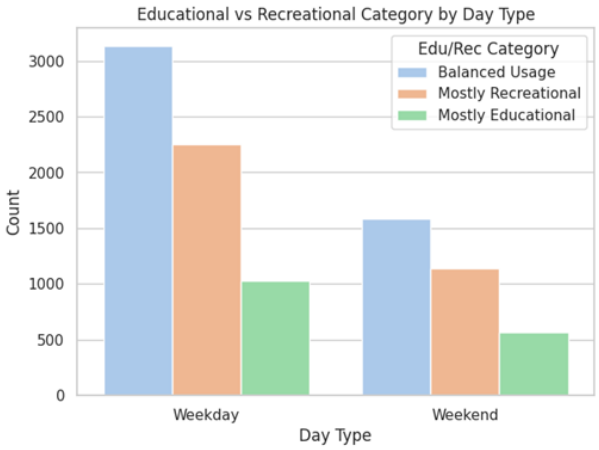
(b) Count of children by Educational/Recreational Category and Age Group

• Pre-teens mostly show balanced or recreational usage, with very little educational usage.

• Kids show a higher share of educational and balanced usage.

• Teens are mainly balanced or recreational users, with very little educational focus.





(c) Educational vs Recreational Category by Gender

- Both males and females show a balanced usage pattern as the most common.
- Mostly recreational usage is the second most frequent for both genders.
- Mostly educational usage is the least common among both.

(d) Educational vs Recreational Category by Day Type

- On weekdays, balanced usage is highest, followed by recreational and educational usage.
- On weekends, usage in all categories is lower but still follows the same order.

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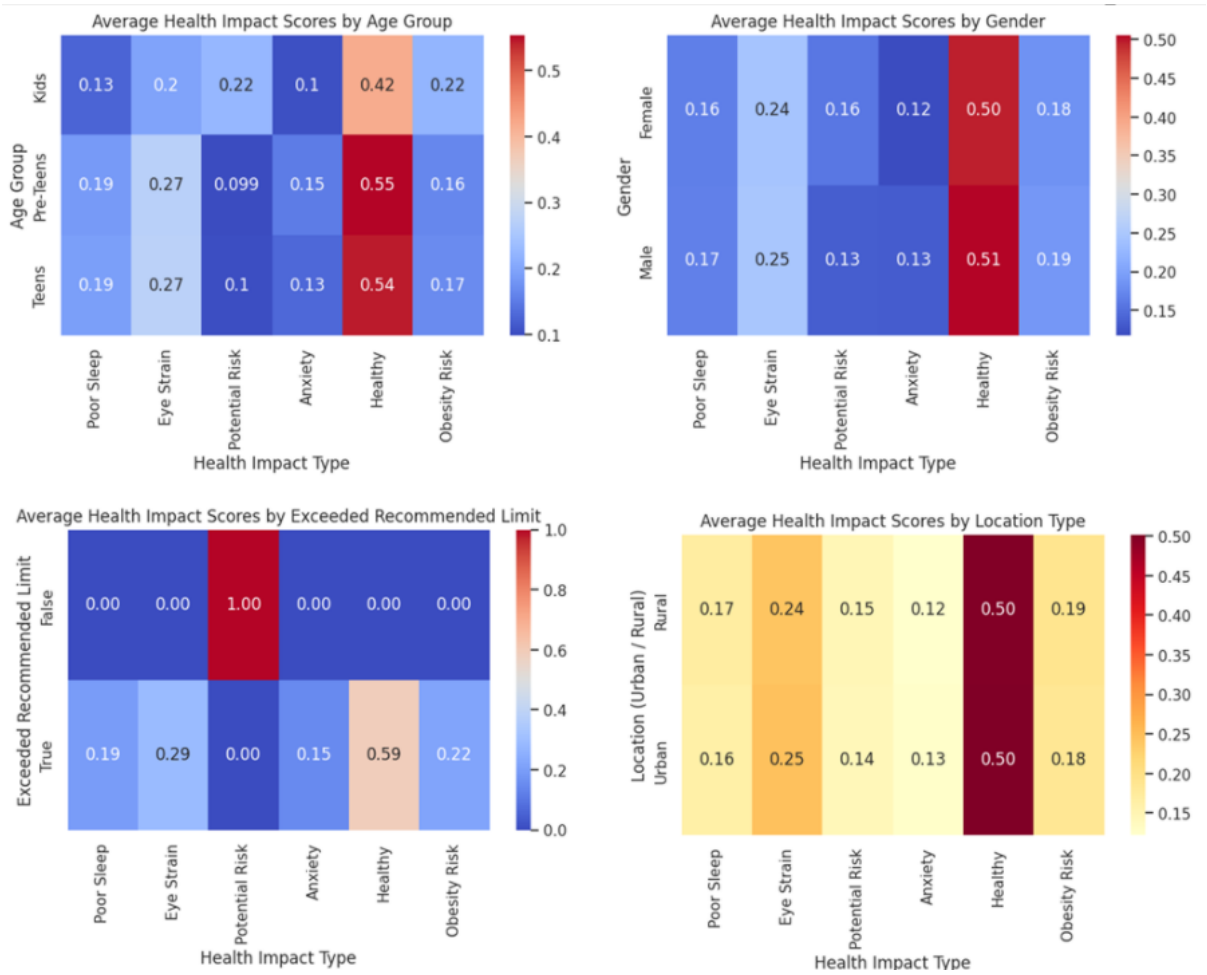
6. Health Impact Analysis



(a) Average Health Impact Scores by Age Group

- Pre-teens and teens show higher anxiety and eye strain scores than kids.
- Kids show higher obesity risk.

(b) Average Health Impact Scores by Gender

- Both males and females show similar health patterns, with minor variations.

(c) Average Health Impact Scores by Exceeded Recommended Limit

- Those who exceed the recommended limit show higher scores in poor sleep, eye strain, and anxiety.
- Users within the limit show much lower risk scores.

(d) Average Health Impact Scores by Location Type

- Both urban and rural users show similar health impact trends.
