Attention Deficit Caused by Excessive Screen Exposure and Its Effect on Language Focus.

KU Kuwait University

The study was conducted under the supervision of Dr.Abdullah Al-Mutairi and Eng. Aisha Alhouti.

Students: Albandri Fahid, Fatmah Alshammari.

Abstract:

The increasing use of screens among children has raised concerns about its potential impact on their attention spans. This study explores the relationship between screen time and attention levels in children, based on a survey completed by mothers. The questionnaire consisted of 10 questions focused on screen usage and attention-related behaviors observed in their children. Although the survey did not account for the children's ages, the collected data was analyzed using R programming to identify patterns and relationships. The results showed a negative correlation between prolonged screen time and children's attention levels, as reported by the participants. However, the lack of age-specific data limits the depth of the findings. This study highlights the need for further research that incorporates critical factors such as age and the type of screen content, to better understand how screen exposure affects attention in children.

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Introduction:

In today's digital age, the use of screens has become an inseparable part of daily life, especially for children. Whether through smartphones, tablets, televisions, or computers, screens provide entertainment, learning opportunities, and social interaction. However, this increasing exposure to screens has sparked concerns about its impact on children's cognitive development, particularly their ability to pay attention and focus.

Research suggests that prolonged screen time can negatively affect children's attention spans, leading to difficulties in concentration. Activities such as reading, creative play, and physical exercise, which are essential for cognitive growth, are often replaced by passive screen use. This shift raises an important question: how does excessive screen exposure influence children's ability to focus and stay attentive?

This study aims to analyze the relationship between screen time and attention deficit among children. Data was collected through a questionnaire targeting mothers, providing insights into their children's screen habits, social interactions, and engagement in alternative activities. By examining these factors, this research seeks to offer valuable recommendations for parents and educators on managing screen exposure and promoting healthier habits for children.

Data description:

This study's data was collected through a **10-question survey** targeting mothers. The survey focused on children's screen time habits, physical activity, and attention-related behaviors to understand the potential impact of screen exposure on focus.

Key Data Points:

1.**Screen Time Duration**: Hours children spend on screens daily or weekly.

2.**Social Interaction**: Whether screen time affects their communication with others (Yes/No).

3.**Physical Activity**: Weekly frequency of physical play or sports.

4.**Alternative Activities**: Parental preference for non-screen activities like reading (Yes/No).

5.**Attention Concerns**: Mothers' observations of focus issues in daily activities (Yes/No).

6.**Overall Screen Impact**: General perception of how screens influence attention.

Dataset Overview:

1.**Participants**: 103 mothers.

2.**Variables**: 6 main factors covering screen habits, activity levels, and focus.

The data provides insights into how screen time affects children's ability to focus, replacing key activities like physical play or social interactions. Analysis using **R programming** identified patterns and relationships relevant to the study's objectives.
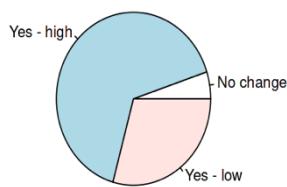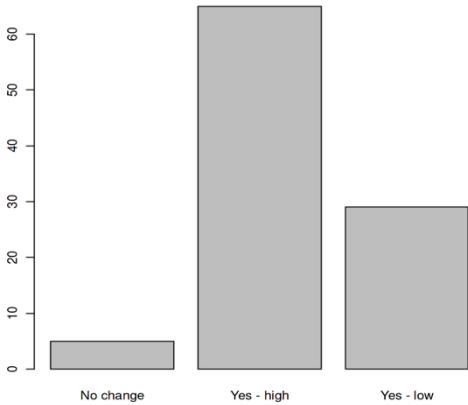
Question analysis:

2. هل لاحظت تغييرات في مستوى إنتباه طفلك بعد زيادة وقت إستخدامه الأجهزة؟ *

- ○ نعم - بشكل كبير
- ○ نعم - شكل خفيف
- ○ لا - لم ألحظ تغييرًا
- ○ غير متأكد

```
#Albandri
table(d$Q2)
barplot(table(d$Q2))
pie (table (d$Q2))

No change Yes - high  Yes - low
         5        65         29
```


From the table and pie chart:

Yes - high: 65 responses

Yes - low: 29 responses

No change: 5 responses
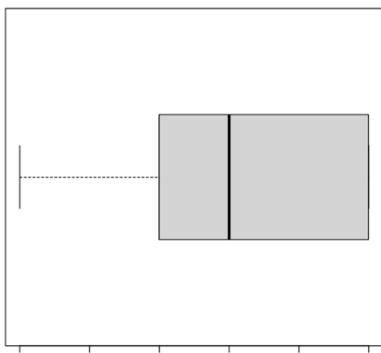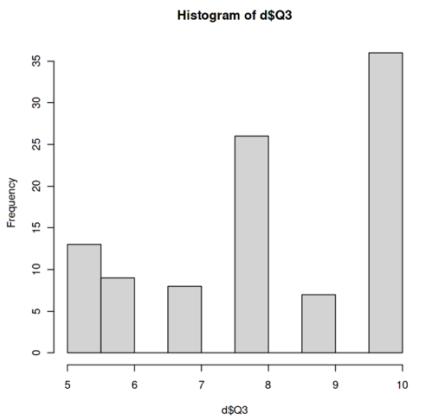
The pie chart further confirms most responses fall into "Yes - high" and "Yes - low".

This means that most parents noticed the impact on their child's attention after extended electronics usage, with a large proportion reporting significant changes. The bar plot and pie chart emphasize this trend visually, highlighting a low percentage of "No change" responses.

3. على مقياس ١ إلى ١٠، إلى أي درجة ترى أن الشاشات تؤثر على مستوى إنتباه طفلك؟ *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

Histogram of d$Q3


```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  5.000   7.000   8.000   8.141  10.000  10.000

1.77861503681537
```

1-Stem-and-Leaf Plot Shows a concentration of values around 7, 8, and 10, indicating that higher ratings are common.

2-Histogram shows the most frequent response is 10, showing strong agreement about the impact of screens on attention.
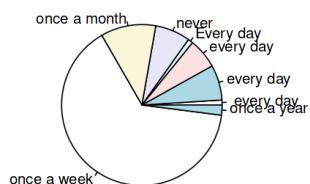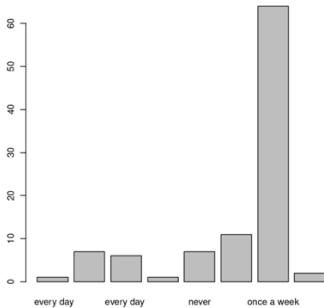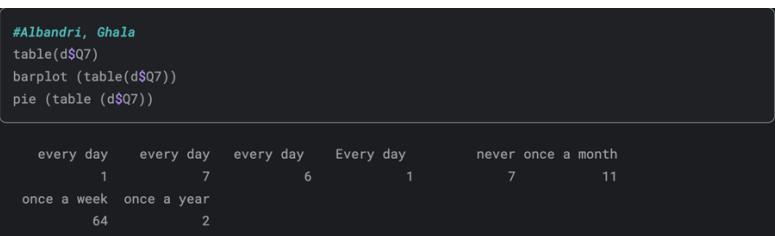
3-Boxplot shows that the data is skewed slightly to the higher end, with no outliers.

4-(IQR) shows most responses between 7 and 10.

The results demonstrate that parents perceive a strong impact of screens on their children's attention levels. Most responses are concentrated between 7 and 10, with a mean of 8.14. This suggests that parents generally agree that screen exposure significantly affects attention. Both the histogram and boxplot visually confirm this trend, while the standard deviation (1.78) indicates moderate variability in responses.

○ مرة بالأسبوع

○ مرة بالشهر

○ مرة بالسنة

○ لا أتحدث

○ Other

```
#Albandri, Ghala
table(d$Q7)
barplot (table(d$Q7))
pie (table (d$Q7))

  every day   every day   every day   Every day        never  once a month
          1           7           6           1            7            11
once a week  once a year
         64            2
```


Frequency Table:
Once a week: 64 responses.
Once a month: 11 responses.
Never: 7 responses.
Every day: Total of 15 responses
Once a year: 2 responses.

Bar Plot:
The category "once a week" shows most parents discuss content weekly.
Other categories, such as "every day" and "once a month," have much lower frequencies.
Pie Chart:
Highlights the large proportion of "once a week" responses, then "once a month" and the response "never" goes last.

The results show that most parents engage with their children weekly to discuss screen content, as shown by 64 responses in the "once a week" category. The next most common category is once a month, with significantly fewer parents reporting daily or annual discussions. The bar plot and pie chart clearly emphasize this trend, showing that discussions about screen content are frequent but not daily for most families.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

9. ةماعلا قئادحلا يف باعلألا وأ مدقلا ةركك ةيندبلا ةطشنألا) ؟اّيعوبسأ كلفط اهسرامي يتلا ةطشنألا ددع وه ام
* (...خلإو
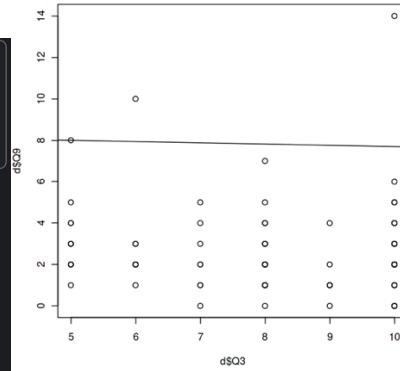
The value must be a number

```
#albandari
cor(d$Q3, d$Q9)
lm(d$Q3 ~ d$Q9)
plot (d$Q3, d$Q9)
abline(lm(d$Q3 ~ d$Q9))

-0.0695404457934165


Call:
lm(formula = d$Q3 ~ d$Q9)

Coefficients:
(Intercept)        d$Q9
   8.30039     -0.06053
```


1-Correlation Coefficient: -0.0695
2-The scatter plot shows a weak negative correlation between the screen impact on attention (Q3) and the number of weekly activities (Q9).
The data shows that the number of activities doesn't strongly affect how much parents believe screens impacting their child's attention. The relationship is weak and not significant.

The value must be a number

9. ةماعلا قئادحلا يف باعلألا وأ مدقلا ةركك ةيندبلا ةطشنألا) ؟اّيعوبسأ كلفط اهسرامي يتلا ةطشنألا ددع وه ام
* (...خلإو

The value must be a number

```
-0.213239461060421


Call:
lm(formula = d$Q5 ~ d$Q9)


Coefficients:
(Intercept)        d$Q9
    22.621      -2.413
```

```
#albandari
cor(d$Q5, d$Q9)
lm(d$Q5 ~ d$Q9)
plot (d$Q5, d$Q9)
abline(lm(d$Q5 ~ d$Q9))
```


Correlation Coefficient: -0.2132
The scatter plot shows a moderate negative correlation between the time children need to refocus (Q5) and the number of weekly activities (Q9).
There is a moderate negative correlation, suggesting that children who engage in more weekly activities may recover focus more quickly after using screens.
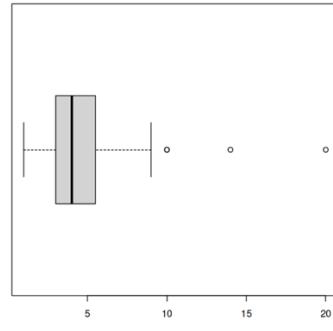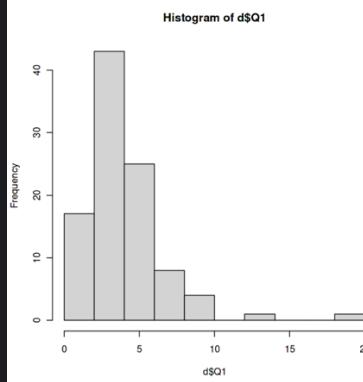
#fatemah
summary(d$Q1)
sd(d$Q1)
stem(d$Q1)
hist(d$Q1)
boxplot(d$Q1, horizontal = TRUE)

‫1. كم عدد الساعات التي يقضيها طفلك يوميًا أمام الشاشات؟ *‬

The value must be a number

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  1.000   3.000   4.000   4.551   5.500  20.000

2.74837145609696

  The decimal point is at the |

   0 | 00000
   2 | 000000000000000000000000000000000
   4 | 0000000000000000000000050000000000000
   6 | 000000000000
   8 | 000000000
  10 | 00
  12 |
  14 | 0
  16 |
  18 |
  20 | 0
```


Histogram of d$Q1

Min: 1 hour
1st Quartile: 3 hours
Median: 4 hours
Mean: 4.55 hours
3rd Quartile: 5.5 hours
Max: 20 hours
Standard Deviation: 2.75
Histogram: Most responses are between 2 to 6 hours, showing a right skew.
Boxplot: Highlights outliers at 16 and 20 hours.
The data shows that the average screen time for children is around 4.5 hours per day, with most children spending between 3 to 5.5 hours. Outliers suggest that a small percentage spend significantly more time (up to 20 hours).

‫8. هل تعتقد إستخدام الشاشات يقلل من فرص التواصل الفعالة بين طفلك وأصدقائه؟ *‬

○ ‫نعم‬

○ ‫لا‬

#fatemah
table(d$Q8)
barplot(table(d$Q8))
pie(table(d$Q8))

no yes
10 89

Bar Plot: Dominated by the "Yes" category.
Pie Chart: shows most parents believe screen use negatively impacts communication opportunities.
majority of parents believe that screen usage reduces effective communication between their children and friends.
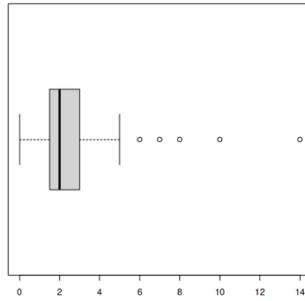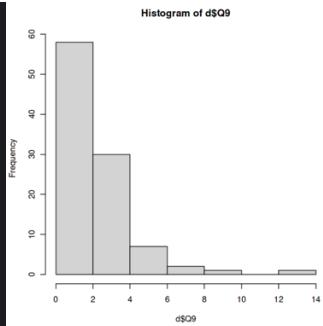
```
#fatemah,yasmin
summary(d$Q9)
sd(d$Q9)
stem(d$Q9)
hist(d$Q9)
boxplot(d$Q9, horizontal = TRUE)
```

9. ما هو عدد الأنشطة التي يمارسها طفلك أسبوعيًا؟ (الأنشطة البدنية ككرة القدم أو الألعاب في الحدائق العامة وإلخ...) *

The value must be a number

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.000   1.500   2.000   2.626   3.000  14.000

2.04333590087216

  The decimal point is at the |

   0 | 000000000000000000000000
   2 | 0000000000000000000000000000000000000000000000000
   4 | 00000000000000000
   6 | 00
   8 | 0
  10 | 0
  12 |
  14 | 0
```

Histogram of d$Q9

min : 0 activities
1st Quartile: 1.5 activities
Median: 2 activities
Mean: 2.63 activities
3rd Quartile: 3 activities
Max: 14 activities
Standard Deviation: 2.04
Histogram: Most children engage in 1 to 3 activities.
Boxplot: shows big values at 12 and 14 activities, which are likely outliers.
Most children participate in 2 to 3 activities per week, reflecting a moderate level of engagement in organized or physical activities.
Outliers suggest that a small group participates in more activities.

1. كم عدد الساعات التي يقضيها طفلك يوميًا أمام الشاشات؟ *

The value must be a number
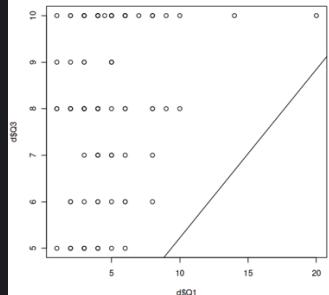
3. على مقياس ١ إلى ١٠، إلى أي درجة ترى أن الشاشات تؤثر على مستوى إنتباه طفلك؟ *

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

```
0.234406120025824


Call:
lm(formula = d$Q1 ~ d$Q3)


Coefficients:
(Intercept)         d$Q3
     1.6016       0.3622
```

```
#fatemah
cor(d$Q1, d$Q3)
lm(d$Q1 ~ d$Q3)
plot (d$Q1, d$Q3)
abline(lm(d$Q1 ~ d$Q3))
```

Correlation Coefficient: 0.2344
The scatter plot shows a weak positive correlation between screen hours (Q1) and the screen impact on attention (Q3).
Even though, the relationship is weak, there is evidence that children who spend more time in front of screens experience greater attention-related challenges.

1. ؟كم عدد الساعات التي يقضيها طفلك يوميًا أمام الشاشات *

The value must be a number

4. ؟كم مرة في الأسبوع تلاحظ إن طفلك يواجه صعوبة في التركيز أثناء المهام الدراسية *

The value must be a number

0.0422723263571604
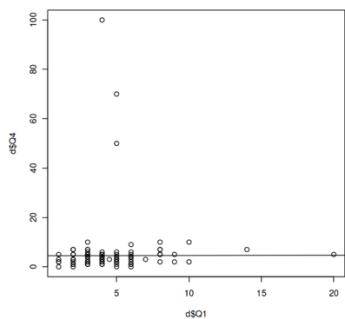
```
Call:
lm(formula = d$Q1 ~ d$Q4)

Coefficients:
(Intercept)          d$Q4
   4.496840       0.009144
```

```
#fatemah
cor(d$Q1, d$Q4)
lm(d$Q1 ~ d$Q4)
plot (d$Q1, d$Q4)
abline(lm(d$Q1 ~ d$Q4))
```


Correlation Coefficient: 0.0422
The scatter plot shows an extremely weak positive correlation between screen hours (Q1) and weekly difficulties focusing on school tasks (Q4).
The data suggests virtually no relationship between screen hours and doing school tasks, as the correlation is very close to zero.

The value must be a number
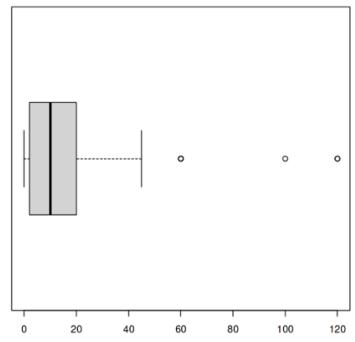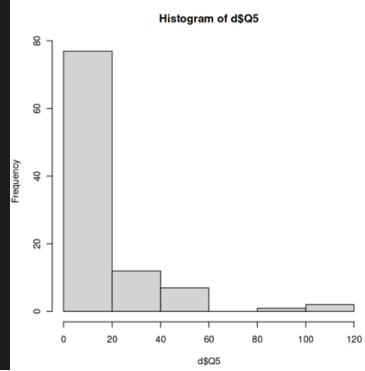
```
#ghala
summary(d$Q5)
sd(d$Q5)
stem(d$Q5)
hist(d$Q5)
boxplot(d$Q5, horizontal = TRUE)
```

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   0.00    2.00   10.00   16.28   20.00  120.00

23.1269965068834


   The decimal point is 1 digit(s) to the right of the |

   0 | 000000111111111111111122222222234555555555555577700000000000000000005555
   2 | 000000000000007
   4 | 055
   6 | 00000
   8 |
  10 | 0
  12 | 00
```


Histogram of d$Q5

Min : 0 minutes
1st Quartile: 2 minutes
Median: 10 minutes
Mean: 16.28 minutes
3rd Quartile: 20 minutes
Max: 120 minutes
Standard Deviation: 23.13
Histogram: most responses fall between 0 and 20 minutes.
Most children need around 10 to 20 minutes to refocus after screen use. However, some of them require longer times, skewing the average higher.
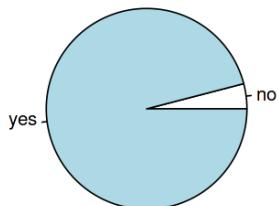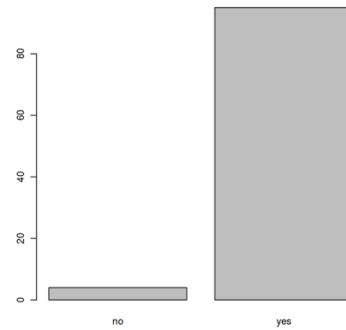
* هل تعتقد أن الأنشطة البديلة (مثل القراءة) أكثر فائدة لتطوير اللغة من إستخدام الشاشات؟ 10.

○ نعم

○ لا

```
#ghala
table(d$Q10)
barplot(table(d$Q10))
pie(table(d$Q10))

no yes
 4  95
```


Bar Plot and Pie Chart: show that the majority answered "Yes".
A strong consensus (approximately 95%) exists among parents that alternative activities, like reading, are more beneficial for language development compared to screen use.

* على مقياس ١ إلى ١٠، إلى أي درجة ترى أن الشاشات تؤثر على مستوى إنتباه طفلك؟ 3.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

* كم دقيقة يحتاج طفلك للعودة للتركيز بعد إستخدام الشاشات؟ 5.

The value must be a number

```
#ghala
cor(d$Q3, d$Q5)
lm(d$Q3 ~ d$Q5)
plot (d$Q3, d$Q5)
abline(lm(d$Q3 ~ d$Q5))
```
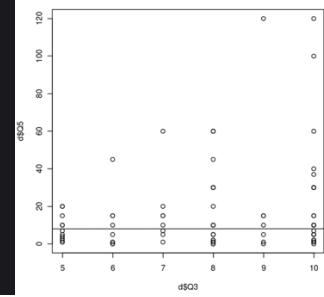
```
0.160758821585685


Call:
lm(formula = d$Q3 ~ d$Q5)


Coefficients:
(Intercept)        d$Q5
    7.94010      0.01236
```


Correlation Coefficient: 0.1608
The scatter plot and regression line show a weak positive correlation between the screen impact on attention and the time needed to refocus.
As attention impact increases, refocusing time tends to increase.
The weak positive correlation suggests that children experiencing greater attention impacts from screens may take longer to refocus.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

4. ؟ةيساردلا ماهملا ءانثأ زيكرتلا يف ةبوعص هجاوي كلفط نإ ظحلات عوبسألا يف ةرم مك *

The value must be a number

0.13900622163111
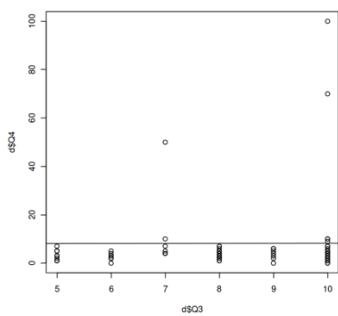
```
Call:
lm(formula = d$Q3 ~ d$Q4)

Coefficients:
(Intercept)        d$Q4
    8.02721      0.01946
```

```
#ghala
cor(d$Q3, d$Q5)
lm(d$Q3 ~ d$Q5)
plot (d$Q3, d$Q5)
abline(lm(d$Q3 ~ d$Q5))
```


Correlation Coefficient: 0.1390
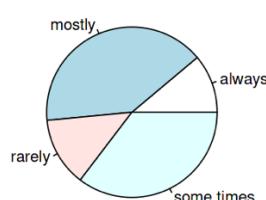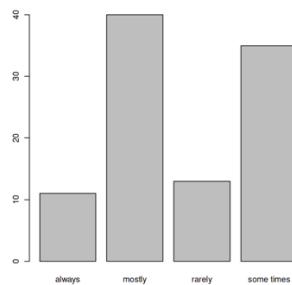
The scatter plot and regression line show a weak positive relationship between the screen impact on attention and weekly focus issues. There is a weak positive correlation, indicating that screen-related attention issues may slightly contribute to difficulties in focusing on school tasks.

6. ؟تاشاشلا مادختسا نم ةرتف دعب ةيلزنملا تابجاولا ءادأ ءانثأ تتشتي كلفط نإ دجت ةرم مك *

○ اًردان

○ اًنايحأ

○ اًبلاغ

○ اًمئاد

```
#Yasmin
table(d$Q6)
barplot(table(d$Q6))
pie(table(d$Q6))

  always    mostly   rarely some times
    11        40        13        35
```


Bar Plot: "Mostly" is the most frequent and "Sometimes" is the next most frequent response.

Pie Chart: Shows most that report their children are "mostly" distracted.
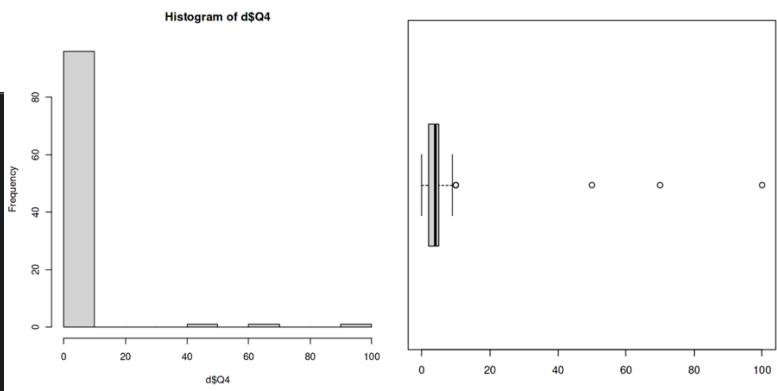
Most parents observe that their children are mostly distracted while doing homework after screen time.

The value must be a number

```
#Yasmin
summary(d$Q4)
sd(d$Q4)
stem(d$Q4)
hist(d$Q4)
boxplot(d$Q4,horizontal=TRUE)
```

Histogram of d$Q4


```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
  0.000   2.000   4.000   5.869   5.000 100.000

12.7051704601456

  The decimal point is 1 digit(s) to the right of the |

  0 | 00001111111111112222222222222222233333333333333334444444444555555555+16
  2 |
  4 | 0
  6 | 0
  8 |
 10 | 0
```

Min: 0

1st Quartile: 2

Median: 4

Mean: 5.87

3rd Quartile: 5

Max: 100

Standard Deviation: 12.71

Histogram: Most responses are between 0 and 5, but there is an outlier at 100.

Boxplot: Shows an outlier, making the distribution right skewed.

most children face focus difficulties 2 to 5 times per week, an extreme outlier at 100 shows either a misunderstanding in reporting. This skews the mean to 5.87, which does not represent the majority.

```
#yasmeen
cor(d$Q1, d$Q9)
lm(d$Q1 ~ d$Q9)
plot (d$Q1, d$Q9)
abline(lm(d$Q1 ~ d$Q9))
```
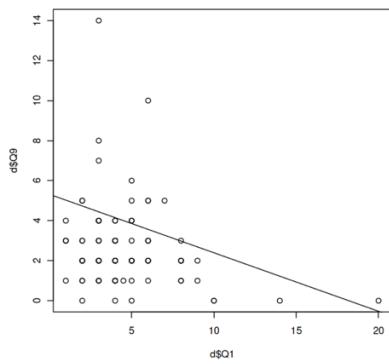
```
-0.21737199895548


Call:
lm(formula = d$Q1 ~ d$Q9)

Coefficients:
(Intercept)          d$Q9
    5.3184       -0.2924
```


Correlation Coefficient: -0.2174

The scatter plot and downward-sloping regression line indicate a weak negative correlation between screen time and weekly activities. As screen time increases, the number of weekly activities tends to decrease slightly.
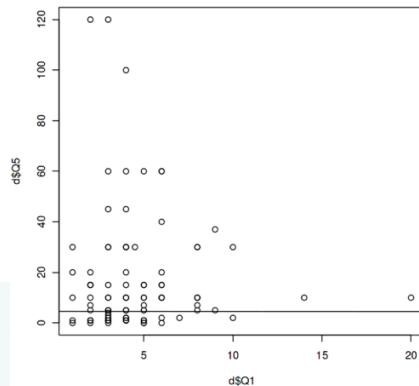
There is a weak negative relationship, suggesting that children who spend more time on screens may participate in fewer weekly activities.

* كم عدد الساعات التي يقضيها طفلك يوميًا أمام الشاشات؟ .1

```
The value must be a number
```

* كم دقيقة يحتاج طفلك للعودة للتركيز بعد إستخدام الشاشات؟ .5

```
The value must be a number
```

-0.0225418787187848

```
Call:
lm(formula = d$Q1 ~ d$Q5)

Coefficients:
(Intercept)        d$Q5
   4.594124   -0.002679
```

```
#yasmeen
cor(d$Q1, d$Q5)
lm(d$Q1 ~ d$Q5)
plot (d$Q1, d$Q5)
abline(lm(d$Q1 ~ d$Q5))
```

Correlation Coefficient: -0.0225
The scatter plot shows no significant relationship between screen time (Q1) and refocusing time (Q5).
The correlation between daily screen hours and the time required to refocus is almost zero, indicating that screen time does not strongly influence refocusing duration.

Conclusion:

The results of this study highlight a clear link between the amount of time children spend in front of screens and their ability to focus on other tasks. While too much screen time generally seems to lower their concentration, the type of content and how it's used also play a big role in the impact.

What this suggests is that it's not just about how long children are using screens, but also about what they're engaging with. This study encourages parents and educators to think carefully about managing screen time, focusing on content that promotes learning and development rather than just entertainment.

Ultimately, the findings offer valuable insights that can help adults create a healthier balance for children, guiding them toward activities that enhance both their attention span and overall cognitive growth.