Influence of Smartphone Addiction & Behavioral Type of Smartphone Use on Developing Anxiety Among High School Students

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1 Introduction

Smartphone addiction (SA) is becoming an increasingly prevalent pandemic worldwide. We considered **anxiety** in the context of SA as a possibly linked factor. This consideration is justified by (Demirci,2015), which proved the likelihood of an existent positive correlation between these variables in similar population groups.

2 Problem Statement

Is there an association between smartphone addiction, behavioral type of smartphone use & prevalence of anxiety among high school students?
Aim: To measure the **prevalence** of **anxiety** among high-school students and to investigate its correlation with demographics, **SA scores** & **behavioral types of smartphone usage.**

3 Methodology

Design: A descriptive, **cross-sectional** study.

Sampling: through **convenience** sampling, 2293 high school students of grades 9-12 across the UAE have been asked to fill out a printed questionnaire of 49 questions, 1234 Questionnaires were retrieved from schools, 319 of which were discarded due to markedly incomplete responses / patterned answers, for a total of **915 responses**.

Instrument: A piloted, **49** item self administered questionnaire was designed to measure 4 main variables: demographics (3), anxiety levels (**BAI**), SA levels (**SAS-SV**) & **behavioral type** of smartphone use (behavioral constructs by Val Hooper, 2007). Responses were grouped by score.

Analysis: Completed using **SPSS 25** for descriptive & bivariate analysis, which included: chi square, t-test, ANOVA, Linear & logistic regression.

- A P-value of **<0.05** was considered statistically **significant**.

4 Results

a. Demographics:

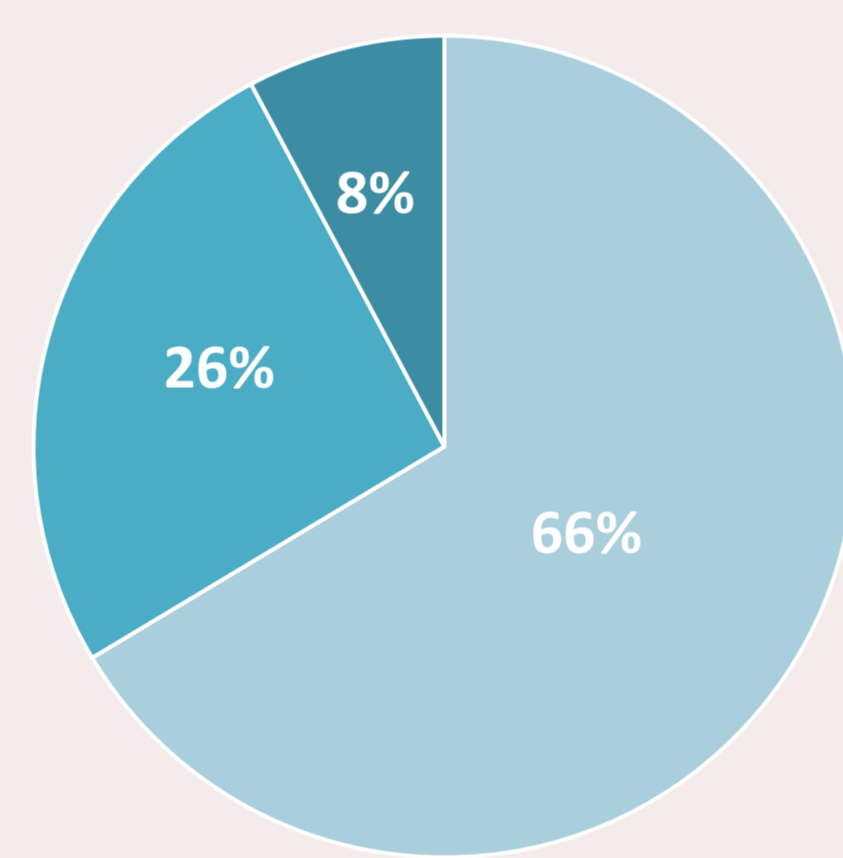| Age	Count
19 +	16
17-18	229
15-16	502
13-14	151

27.2% 50.1% 49.9%
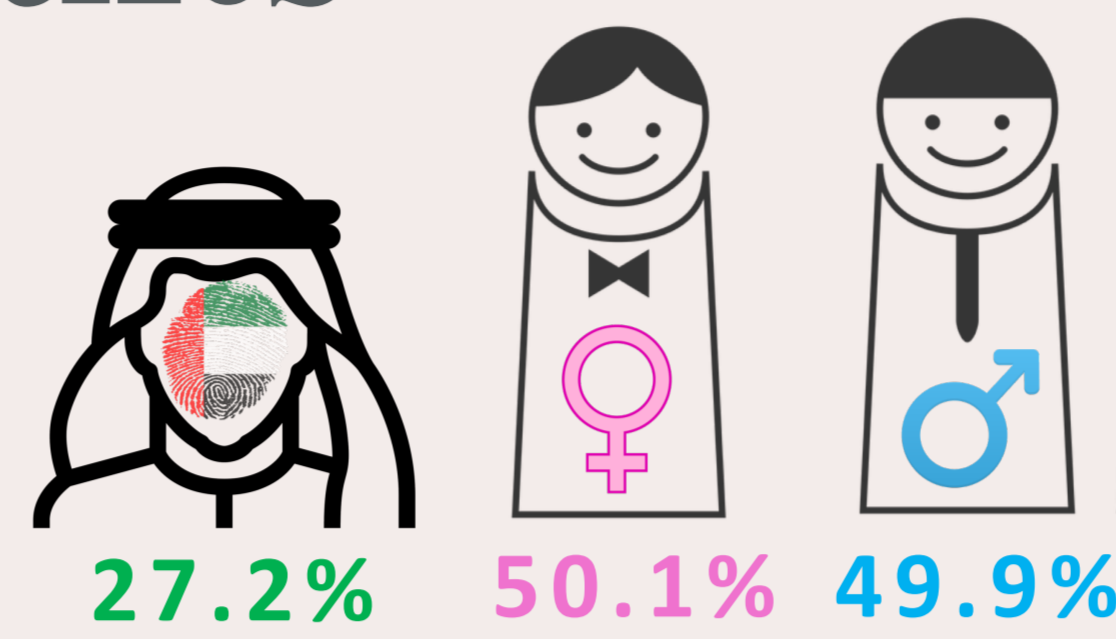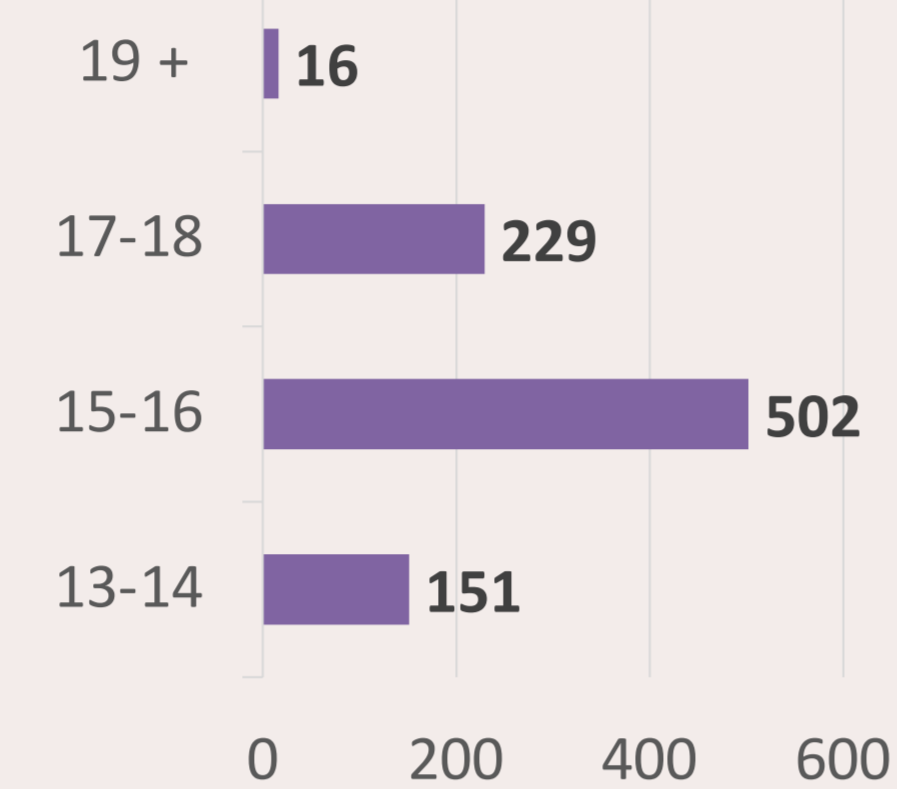
Student age groups:
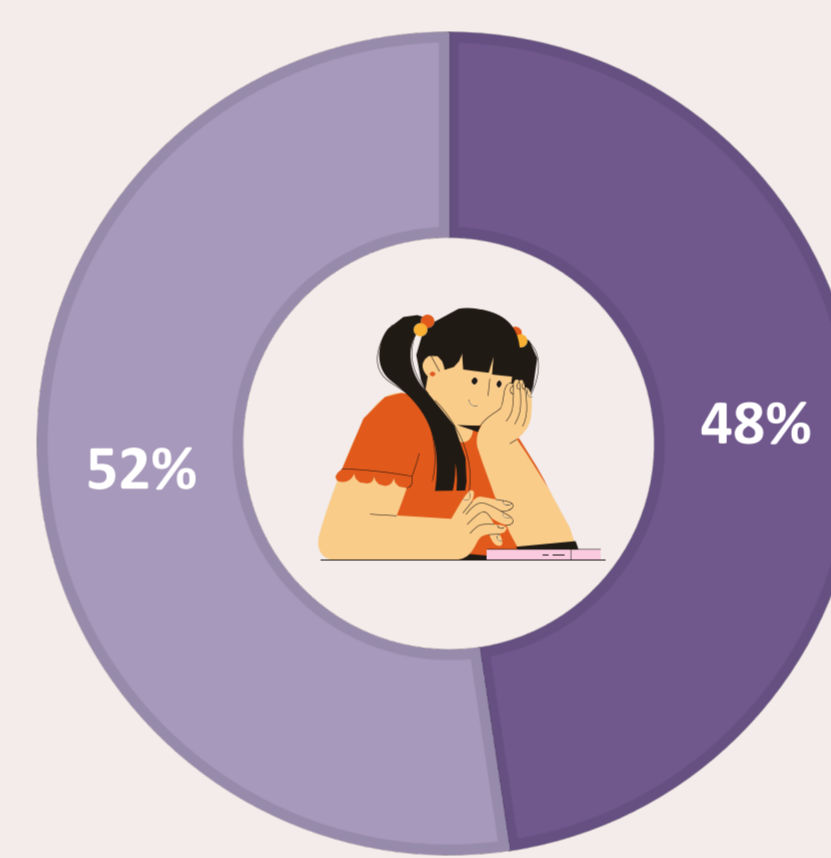- **55.9%** were aged **15-16 years**.

b. Prevalence:

- High anxiety was more evident in females (44.9%) vs males (22%).
- Overall **Mean** SAS score was **27.19**, females' **mode** score (**36**) was higher than males' (**25**).
- Dependent, Habitual & mandatory types of use were the most prevalent.
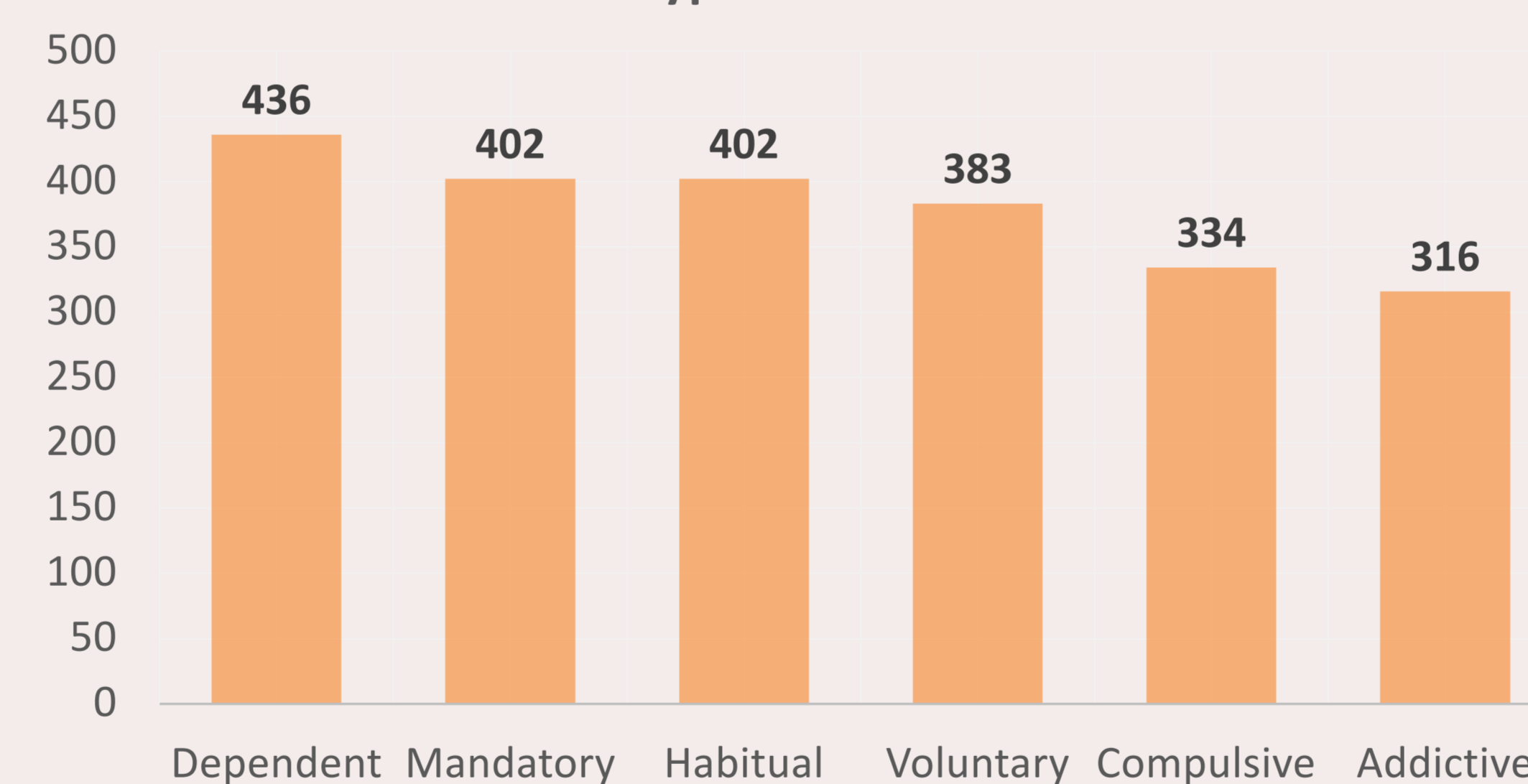
ANXIETY LEVELS

8%
26%
66%

■ Low ■ Moderate ■ High

DEPENDENT TYPE OF USE

52% 48%

■ Present ■ Absent

Prevalence of Types of Use in 915 Students

Type	Count
Dependent	436
Mandatory	402
Habitual	402
Voluntary	383
Compulsive	334
Addictive	316

c. Correlations:

- Dependent, compulsive, habitual & addictive were highly correlated with SAS scores, addictive behavior being the strongest effector by a B factor of 4.973.
- Voluntary use was correlated significantly (p0.022). Can predict decreased addiction score by a factor of **-0.98**.

Factor	Significance	Exp(B) factor	95% CI for Exp(B)	
			Lower	Higher
SAS	.002	1.038	1.013	1.063
Gender	.000	2.312	1.686	3.172
Addictive type of use	.092	1.357	.953	1.931

5 Discussion

- Since overall prevalence of **moderate-severe Anxiety** levels combined was **33.6 %**, [much higher in **females** compared to males], we conclude that the female gender is a risk factor for developing anxiety, which is consistent with female **genetic composition** (Lewinsohn, et. al 1998).
- Predominance in females can also be owed to the inherent **metacognitive state** of thinking in girls, leading to higher **Type 2** "negative" **worry** levels, versus Type 1 worry that's prevalent in boys, who have lower anxiety levels. (Bahrami F, et. al 2011).
- Students with higher SAS-SV scores have had **higher scores on Beck's Anxiety Scale**. Such an association can be partly explained by "**reassurance seeking**" & "**Fear of Missing Out**" **pathways** suggested in (Billieux et al., 2015a)'s explanation of anxiety.
- We remain skeptical regarding **age's contribution** to anxiety. We believe that a **study with a larger age reach** may find higher prevalence of mental disorders amongst adolescent populations.

Limitations: onset of quarantine caused the loss of many student responses, population wasn't fulfilled.
- Population wasn't normally distributed age wise.

6 Conclusions

SA had a mild positive correlation with developing anxiety. Females had higher levels of SA & anxiety compared to males. The addictive subtype of smartphone use was more predictive of SAS score compared to other types of behavioral use; we suggest an indirect relation of such use with developing higher anxiety levels.

Recommendations:
- To investigate the prevalence of **other mental disorders** within a larger population & assess the need for intervention.
- To allocate resources (counseling services, classes, interventions) **within reach of high school students** to reduce anxiety's prevalence, **especially in girls**.
- To design and implement programs that shed light on the **effect of smartphones** on students' quality of life & **relate anxiousness** with additive use of smartphones, conveying this effect to students in hopes of improving their habits of use.

References

1. Demirci K., Akgönül M., Akpinar A. Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. Journal of Behavioral Addictions. 2015;4(2):85–92.
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4. Kuss, D., Griffiths, M., Karila, L., Billieux, J., 2014. Internet addiction: A systematic review of epidemiological research for the last decade. Curr. Pharm. Des. 20, 4026-4052.