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Smartphone Addiction and Negative Behaviors among High School Students

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ABSTRACT. *Researchers have seen many cases in which teens have felt frustrated when internet connection was not reachable or even got anxious when their phone battery ran out. These situations have created a 21st century term, known as "nomophobia", the fear of not being able to use your mobile device, and such fear has opened up to the issue of smartphone addiction. Victims of smartphone addiction are not only exposed to physical and mental side effects such as back pain and depression, but they are also likely to perform risky behaviors. One prime example of risk, recorded New York City, is looking at smartphones while crossing dangerous streets. Through our observational data, we observed the total cases of smartphone usage found in various public locations, and afterwards recorded each phone user's body position, behavior type and behavior time. The results suggested that at most locations, about half of the people were seen using their smartphones. Additionally, more than 70% of these smartphone users were found using their phones in negative ways, such as staring at their phones head down, for a long period of time. The surveys revealed that at least 75% of students in each grade level experienced at least one of the signs of smartphone addiction. Our study shows that raising awareness can efficiently improve the quality of life in our community because not only will people be aware and informed of the issue, but they will also be inspired to stop their addictive phone behaviors.*

KEYWORDS: *smartphone addiction, negative behavior, high school students, teenagers*

1. Introduction

Although the evolution of phones marks a long history, the history of smartphone addiction has just recently begun. New social media apps and various other gaming, entertainment apps have become popular amongst adolescents during recent years, yet they quickly turned people into a nation of smartphone addicts. This issue of phone addiction continues to persist today because most apps have been coordinated and designed to ultimately engage their users. Once falling into the trap of opening the app, features like "infinite scrolling" on Instagram and Facebook, will get people hooked on their phones for hours because it continuously loads new

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content since there is no built-in endpoint. This feature has been purposely designed to reduce users' sense of control when using their phones, while increasing a sense of addiction to the app (Vox, 2018). Nowadays, smartphone addiction affects populations of various age groups, ranging from children to elderly. As a result, all groups of people can easily become victims to the negative social, mental and physical impacts that can follow from long hours of smartphone use. A study at the University of California Los Angeles showed that children from 11-12 years old, who constantly played on their phones rather than socialize with their peers, showed a lag in developing emotional and social skills. Additionally, they were also likely to experience negative mental impacts, such as stress, and depression, due to exposure to possible cyberbullying, "fear of missing out" and increased levels of GABA, which is a neurotransmitter that inhibits brain signals (Kellogg, 2014). Additionally, physical impacts include dry eyes and loss of sleep (Loria, 2014). In fact, according to The Vision Council, about 61% of Americans have experienced eye strain after using their smartphones for long periods of time (Hill, 2015).

Smartphone addiction has grown to be an important issue. The idea of being addicted to smartphones is scientifically known as nomophobia: the fear of not being able to use your cellphone or other smart devices (LaMotte, 2017). Phone addiction can also be identified through excessive use characterized by a loss of sense of time and frustration when cellphone network is unreachable (Singh Bhatia, 2008). These behaviors of fear and frustration suggest that phone addiction is a serious issue because smartphones are not intended to create stressful emotions when unable to be used. Researchers have also reported seeing more common unsafe behaviors due to smartphone addiction. In midtown Manhattan, for example, 42% of pedestrians who entered traffic during a "Don't Walk" signal were talking on a cell phone, wearing headphones or looking down at an electronic device (Weitz, 2017).

2. Methodology

The research methods that were used included observations and surveys. For observational data, we chose four common public locations: parks, restaurants, subway platforms, and the streets. For each type of location, we randomly selected a definite location (Park - Central Park (Manhattan)/Restaurant- McDonald's (Bronx)/Street - Corner between Manhattan Avenue and Greenpoint Avenue (Brooklyn)/Subway - Flushing Main Street Station (Queens). In each of these selected locations, we spent 30 minutes counting the number of individuals using their smartphones, from the total estimated population we saw within our area of observation. Then, we categorized the smartphone users upon three factors: their physical position when using their phone, the type of behavior performed on the phone and the duration of their actions. After collecting the observational data from all selected locations, we inputted the data from each location into separate SPSS files. We ran frequencies between the number of smartphone users and the number of non-smartphone users. Next, out of the number of smartphone users, we determined how many used their phone is a positive way and how many used them in a negative way. This was done by setting the "duration of smartphone usage" as

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the variable for distinguishing between negative or positive smartphone use.

For the questionnaires/survey, a total of ten questions were asked to teenagers attending the Bronx High School of Science regarding their smartphone usage. For example, two images were shown with different scenarios. Scenario A included individuals in a restaurant using their smartphones with friends. Scenario B included individuals eating and talking without the presence of smartphones. Participants were asked which scenario he or she encounters the most often. In addition, we asked three different grade levels beginning with the freshmen population to the junior population. Each grade level had two homerooms randomly selected and the surveys were distributed and conducted during that time. We ran crosstabs on SPSS to see the association between the questions on the survey indicating signs of addiction and their behavioral responses in social areas. Thus, an index was created for the first four questions on the survey that show signs of addiction and an index for the last four questions depicting scenarios in social settings was created. Furthermore, from the signs of addiction index that was created from questions one to four, frequencies were ran on SPSS to indicate the percentage of the sample size from each grade level experienced signs of addiction. The people we studied in our field of research were from all age groups. In fact, with the observational data in the park, subway, restaurant, and street, we recorded the number of people using their phones, and this information was able to account for the actions of all types of age groups, ranging from a child using their ipad, to an adult using their smartphone. In addition, we were also able to study adolescents since the survey was conducted at a high school; specifically 114 adolescents were surveyed.

3. Results and discussion

Our hypothesis was that individuals with signs of smartphone addiction were more likely to be influenced to use their smartphones in social areas and that these smartphone users are also expected to reflect negative behaviors. According to the results, out of all the smartphone users at the restaurant and on the street, 100% reflected a negative behavior while using their devices, which means that they played with their phones for a long period of time. Levels of addiction and behaviors in social areas for the Junior data set regarding smartphones are significantly associated (Table 1), Chi Square (20) = 41.472, $p<.05$. Similarly, for the Sophomore data set, levels of addiction and behaviors in social areas regarding smartphones are significantly associated (Table 2), Chi Square (12) = 37.875, $p<.05$.

Table 1. Junior Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	41.472[a]	20	.003
Likelihood Ratio	42.197	20	.003
Linear-by-Linear Association	14.463	1	.000
N of Valid Cases	45		

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Table 2. Sophomore Chi-Square Test

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.875[a]	12	.000
Likelihood Ratio	41.452	12	.000
Linear-by-Linear Association	3.956	1	.047
N of Valid Cases	36		

a. 20 cells (100.0%) have expected count less than 5. The minimum expected count is 1.11.

Table 3. Freshmen Index of Addiction

Index Addiction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	11	25.6	25.6	25.6
	1.00	20	46.5	46.5	72.1
	2.00	6	14.0	14.0	86.0
	3.00	5	11.6	11.6	97.7
	4.00	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

Table 4. Junior Index of Addiction

index addiction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	5	11.1	11.1	11.1
	1.00	9	20.0	20.0	31.1
	2.00	11	24.4	24.4	55.6
	3.00	12	26.7	26.7	82.2
	4.00	8	17.8	17.8	100.0
	Total	45	100.0	100.0	

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From the Freshmen data set, 74.4% of the sample size said that they experienced at least one sign of smartphone addiction (Table 3). From the Junior data set, 88.9% of the sample size said that they experienced at least one sign of smartphone addiction (Table 4). As a result, the increase in percentages of the sample size may be because of the overwhelming stress of college and a greater workload.

The purpose of the research was to show prevalence of smartphone addiction in the society we live in today and how it has affected our daily behaviors. According to our research findings, the survey results showed that more than 70% of students from each grade, experienced at least one sign of nomophobia, suggesting that there is a prevalent number of people experiencing smartphone addiction. Additionally, the survey crosstab results showed a strong association between signs of smartphone addiction and negative behavioral responses regarding smartphone use. This is a significant result because not only does it address the prevalence of the issue, but it also suggests the severity of the problem. In fact, all those people that we recorded using their phones in a negative way, are on the path of experiencing possible eye vision and posture problems, as well as possible mental and social problems, in the near future. Furthermore, we learned that about 42% of pedestrians had entered traffic during a “Don’t Walk” signal in New York City. When conducting our field of research, we saw a few cases of people crossing the street, head down, looking at their phones.

The survey also included a question demonstrating the likeliness of individuals to use an app that would limit the amount of time spent on smartphones. The hypothesis was that teenagers are aware of the problem of cellphone addiction and are willing to get help to change. However, out of the total Freshmen sample size, 20.0% of the population agreed that if they had access to an app that would help against smartphone addiction, they would use it (Table 5). However, the majority of Sophomores and Juniors disagreed against the usage of an app to limit their smartphone addiction with 41.9% and 25.6% respectively (Table 6&7)

Table 5. App Frequency for Freshmen

Use of app against smartphone addiction if had access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neither agree nor disagree	18	41.9	45.0	45.0
	strongly disagree	4	9.3	10.0	55.0
	disagree	5	11.6	12.5	67.5
	agree	8	18.6	20.0	87.5
	strongly agree	5	11.6	12.5	100.0
	Total	40	93.0	100.0	
Missing	System	3	7.0		
Total		43	100.0		

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Table 6. App Frequency for Sophomores

Use of app against smartphone addiction if had access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neither Agree nor Disagree	10	27.8	32.3	32.3
	Strongly Disagree	1	2.8	3.2	35.5
	Disagree	13	36.1	41.9	77.4
	Agree	4	11.1	12.9	90.3
	Strongly Agree	3	8.3	9.7	100.0
	Total	31	86.1	100.0	
Missing	System	5	13.9		
Total		36	100.0		

Table 7. App Frequency for Juniors

Use of app against smartphone addiction if had access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neither Agree nor Disagree	10	22.2	23.3	23.3
	Strongly disagree	9	20.0	20.9	44.2
	Disagree	11	24.4	25.6	69.8
	Agree	10	22.2	23.3	93.0
	Strongly agree	3	6.7	7.0	100.0
	Total	43	95.6	100.0	
Missing	System	2	4.4		
Total		45	100.0		

4. Conclusion

From the data gathered by the surveys, content analysis, and observational data, smartphone addiction has increased greatly throughout the years with rising technological advancements. According to survey findings, there was a strong association between the levels of addiction and the behaviors in social settings. A recommended solution to the issue of smartphone addiction is raising awareness about the problem. This recommended solution currently exists in countries like South Korea (Kim & Jee, 2015), where its science ministry now requires internet addiction classes to be taught in schools, particularly focusing on internet addiction with smartphones. However, raising awareness is not just limited in the form of teaching lessons in schools. In fact, in places like Sydney, Australia, the community has initiated a day dedicated to turning off technology for five hours, known as International Moodoff Day on Feb. 24.

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This solution of raising awareness on smartphone addiction can also be adapted in the community of New York City because many organizations who help with cases of smartphone addiction, already exist around America. Awareness campaigns, posters and lessons can be adapted in schools, around the streets of New York and on the internet. A personal challenge that we might face before implementing our recommendation is the possible cost needed to spread awareness. We need to get together and work with the school, parents, the city, and other related organizations to raise funds as well as create posters, classes, and even campaigns to spread awareness.

Some groups of people that may oppose to our recommendation may be people who work in the technology industry, especially in social media and gaming companies. This is because raising awareness about smartphone addiction blames social media and entertainment apps to be the main reason of addiction. Once aware of this problem, people may cut down their use on these apps, and possibly delete them overall, which can financially hurt these companies. To make it a win-win situation, we recommend developing free apps that can help with smartphone addiction for both android and apple users. According to our study, the earlier we develop and promote the apps among high schools, the more likely they are to use the apps to get rid of the smartphone addiction.

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