



Outcomes of Smartphone Use Dependency among Students in Selected Universities in Kiambu County, Kenya

Annastacia Syoindo Wambua¹ & Wambua Pius Muasa Ph.D²

The Catholic University of Eastern Africa, Tangaza University, Kenya

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ABSTRACT

The excessive use of smartphone has been found to affect the well-being of university students. The current study aimed to examine the outcome of smartphone use dependency among university students in selected universities in Kiambu County, Kenya. The study adopted embedded mixed method research design. The study population comprised 1,350 students, from which a sample size of 303 participants was derived using the Krejcie and Morgan formula. A simple random sampling technique was employed to select a sample size of 303 participants. The data on outcome smartphone use dependency was collected using a questionnaire. In addition, qualitative data on outcome smartphone use dependency from the key informants was collected using Interview Guide. The quantitative data was analyzed using descriptive statistics and qualitative data was analyzed using thematic analysis. The findings showed the outcome of smartphone use dependency to be mental health issues (37.1%), sleep fewer hours (48%), detachment from friends (40%) and extreme worry (25.4%). The themes for outcome of smartphone use dependency were addiction to pornography, masturbation, poor performance, gambling, femicide and sleep disturbance. The study recommends that university administration need to offer workshops and seminars to educate students on smartphone use effect on mental health challenges, coping mechanisms, and available relevant services. Also, the study recommends an environment to be created in which the students feel free to communicate their concerns and difficulties. This can be accomplished through peer support groups or mentoring programs that improve the overall students well-being. University students may need to be encouraged to spend some quality time with their friends and family rather than spending several hours on smartphone screens. Finally, efforts need to be made to encourage face-to-face encounters in the study groups rather than depending primarily on digital communication via the smartphone.

Keywords: Outcomes, smartphone use dependency, University students, Kiambu, Kenya

INTRODUCTION

Smartphone use dependency among university students has been reported to have negative implication to their mental health. Servidio (2021) investigates the mediating role of the fear of missing out and smartphone use patterns on self-control and problematic smartphone use among Italian university students. The study was conducted in Italy with 405 university students, predominantly attending psychological and educational courses. Data collection involved a paper-pencil method. Statistical analyses included Pearson correlation analysis and a structural equation model. Females showed higher scores in smartphone use patterns, self-control, and socializing smartphone use patterns, while males scored higher in information-seeking and entertainment. In China, a study was carried out by Song et al. (2022) which investigated anxiety and its relationship with sleep disturbance and problematic smartphone use among Chinese medical students during COVID-19 home confinement, a structural equation model analysis. The study was made up of 666 medical students validly answered a self-administered questionnaire. The study established that problematic smartphone use and sleep disturbance were linked to increased anxiety levels among students, which is a risk factors for mental health ($\beta=0.53$ to $\beta=0.22$, $P<0.01$). It was also found that 17.9% of the students experienced elevated anxiety. In the USA, a study conducted by Elhai et al. (2023), on problematic smartphone use and mental health problems: current state of research and future directions. The study

revealed that excessive smartphone use was linked to a decline in mental health, with students reporting higher levels of anxiety and worry.

In Nigeria, Ayandele et al. (2020) investigated addictive use of smartphone, depression and anxiety among female undergraduates: a cross-sectional study. The eligibility criteria were that respondents must be female students of the selected institutions, 16 years or older and must own a smartphone. Out of the 500 distributed questionnaires, 480 were retrieved; 82 were excluded due to incomplete responses, and 398 correctly filled questionnaires (79.6% response rate) were analyzed. The study indicated a significant association between smartphone addiction and symptoms of depression and anxiety. The results showed that 1.01% of the respondents were probable smartphone addicts and 17.34% were at-risk, while 14.32% and 16.33% manifested symptoms of anxiety and moderate-to-severe depression, respectively. Depression ($r = 0.24$, $p < 0.01$) and anxiety ($r = 0.21$, $p < 0.01$) have a significant relationship with the addictive use of smartphones.

Sserunkuuma et al. (2023) explored the problematic use of the internet, smartphones, and social media among medical students and its relationship with depression. The study was conducted at a Ugandan public university and aimed to investigate the association between online addiction behaviours and depression symptoms among medical students. Methodologically, a pilot study was undertaken with 269 medical students, where data were collected through a survey encompassing socio-demographic factors, lifestyle habits, online behaviours, smartphone addiction, social media addiction, internet addiction, life stressors, and depression symptoms. Hierarchical linear regression models were employed to analyse the relationships between different forms of online addiction and the severity of depression symptoms. The findings revealed that a significant proportion of medical students exhibited moderate to severe depression symptoms (16.73%). Moreover, a high prevalence of being at risk of smartphone addiction (45.72%), social media addiction (74.34%), and internet addiction (8.55%) was observed among the participants. Notably, online use behaviours and online-related addictions were found to predict a portion of the severity of depression symptoms, highlighting the potential impact of excessive internet, smartphone, and social media use on mental health outcomes among medical students. This study contributes valuable insights into the interplay between online behaviours and mental health issues among medical students in Uganda, emphasizing the need for targeted interventions and support services to address problematic internet use and its implications for depression in academic settings.

Kaniaru et al. (2020) conducted a quasi-experimental study among nursing students in two public universities in Kenya. The study aimed to identify the effects of long-term smartphone use on students' attention and learning styles. The study included a total of 811 third- and fourth-year nursing students, with a control group and an experimental group. The participants were randomly assigned to each group. Data analysis was performed using IBM SPSS Statistics, and descriptive analysis, t-tests, Mann-Whitney U tests, and Spearman's correlation test were used. The findings showed that both groups had higher-than-average levels of monophobia at the beginning of the class. The experimental group, which left their cell phones on a table in the corner of the classroom, had higher average scores in problematic smartphone use, attention, and knowledge. A relationship was found between nomophobia and problematic smartphone use. The study design was quasi-experimental, and the participants were randomly assigned to an experimental group and a control group.

A total of 124 nursing students from two public universities in Kenya took part in the study. Descriptive analysis, t-tests, Mann-Whitney U tests, and Spearman's correlation test were used for data analysis. The data collection involved the use of questionnaires, including the NMP-Q questionnaire and a knowledge test about a video on inhalation therapy. Ethical considerations were taken into account, and informed consent was obtained from the participants. The findings of the study showed that both the control group and the experimental group had higher-than-average levels of monophobia at the beginning of the class. The experimental group, which left their cell phones on a table in the corner of the classroom, had higher average scores in problematic smartphone use, attention, and knowledge. The results also indicated a relationship between nomophobia and problematic smartphone use.

Musyoka et al. (2021) conducted a study at two university campuses to investigate alcohol and substance use among first-year students. The primary aim of the study was to assess the knowledge, attitude, and

prevalence of alcohol and substance use at the beginning of university and after a 12-month follow-up survey post-intervention. The methodology employed a cross-sectional survey and a quasi-experimental design, utilizing pretest and post-test questionnaires. The study aimed to evaluate the effectiveness of a peer mentoring intervention program in preventing alcohol and substance use, comparing the reach of peer mentors using healthy technology versus a paper-based approach. The research also analysed the alcohol and substance use patterns among students identified by peer mentors and explored the experiences of mentors during the intervention delivery process. Key findings included documenting changes in mentors' attitudes pre- and post-intervention, as well as conducting focused group discussions to gather insights on the experiences of mentors using either health technology or paper-based tools for peer mentoring. This study contributed valuable insights into alcohol and substance use behaviours among university students and the impact of peer mentoring interventions in addressing these issues.

Burihani and Momanyi (2020) examined the perceptions of students, lecturers, administrative staff, and parents on mobile phone use by students at the Aljamea-tus-Saifiyah Nairobi campus. The study used a linear systematic sampling technique to select a sample of 84 students, 26 lecturers through linear, methodical sampling, and 7 administrative staff through expert sampling. Questionnaires were used to collect data from students, lecturers, and parents, while interview guides were used for administrative staff. Quantitative data were analysed using SPSS software, and qualitative data were categorized into themes to identify patterns and connections. In the findings, the authors noted that students cited reasons such as communication, academic purposes, entertainment, and social networking. Lecturers highlighted the importance of mobile phones for academic research and communication. Parents expressed concerns about excessive use affecting academic performance. Students reported using mobile phones for an average of 4-6 hours per day. Lecturers used mobile phones primarily for academic and communication purposes. Though studies have been conducted on outcomes of smartphone use dependency among students, there are limited studies with private university students in Kiambu country and therefore, the current study seeks to fill this gap.

METHODOLOGY

The study adopted embedded mixed method research design. The design was suitable for the current study because it aimed to examine the outcome of smartphone use dependency among university students and qualitative findings were used to support the quantitative findings. The study was carried out with three private universities in Kiambu County, located in the central region of Kenya. The study population mainly consisted of 1350 students from selected universities in Kiambu County. Through Krejcie and Morgan (1970) formula and simple random sampling, the study employed a sample size of 303 participants.

In addition, using purposive sampling, 3 university counsellors were selected to participate in the study for qualitative strand. The quantitative data was collected using a questionnaire while qualitative data was collected using Interview Guide. The questionnaire was based on a four-point Likert scale ranging from strongly disagree (1) to strongly agree (4). The lowest possible score any participant could get is 7 and the highest score any participant may get is 14. The collected quantitative data was analyzed using descriptive statistics and particularly percentages with SPSS. On the other hand, qualitative data was analyzed using narrative analysis.

RESULTS AND DISCUSSION

The study was set to examine outcome of smartphone use dependency among university students in selected universities in Kiambu County, Kenya. The demographic of the participants are presented followed by the findings of the study.

Demographic Characteristics of Student Participants

The study run descriptive statistics to understand the demographic of the participants and the results are presented in table 1.

**Table 1: Demographic Characteristics of Student Participants**

Gender	Frequency	Percentage
Male	165	58.3%
Female	118	41.7%
Total	283	100.0%
Age		
17-20	33	11.7%
21-25	198	70.0%
25-30	52	18.4%
Total	283	100.0%
Year of Study		
Less than a year	38	13.4%
1-2 years	88	31.1%
3-4 years	157	55.5%
Total	283	100.0%
Total	283	100.0%

The results in Table 1 show that most of the student participants were males 165 (58.3%), while the female participants were 118 (41.7%). In addition, most of the participants 198 (70%) were between the ages of 21-25 years, while the lowest age was 17-20 years, at 33 (11.7%). The year of study revealed that the participants within 3-4 years in the university were 157 (55.5%), while the participants less than a year in the university was 38 (13.4%). Also, three counselors from the three universities were interviewed for qualitative data with an aim of supporting quantitative findings. The counselors were all females their age ranging between 40 to 50 years.

Outcomes of Problematic Smartphone Use Dependency among Students in Selected Universities in Kiambu County, Kenya

The study was to examine the outcomes of Problematic smartphone use among students in selected universities in Kiambu County, Kenya. Descriptive statistical analysis was used for this analysis. The findings are shown in Table 2.

Table 2: The Outcomes of Problematic Smartphone Use among Students

	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
I feel stressed I have mental health concerns which are	9.2% (n =26)	37.1% (n = 105)	12.7% (n =36)	37.1% (n =105)	3.9% (n =11)



related to my way of smartphone use: like lack of self-control, anxiety and depression					
I find that, my smartphone has gradually led me to sleep fewer hours, and then I feel a lack of energy the next day.	22.3% (n = 63)	48.1% (n =136)	11.7% (n =33)	16.3% (n =46)	1.8% (n = 5)
Because of the many hours I spend each day on my smartphone I find that, I vividly suffer an unhealthy lifestyle when I am with others.	7.4% (n =21)	38.9% (n =110)	16.3% (n =46)	33.6% (n =95)	3.9% (n = 11)
My smartphone habits have led me to frequently find myself significantly alone and detached from my former friends.	12.3% (n =34)	40.6% (n =115)	11.3% (n =32)	31.8% (n = 90)	4.2% (n =12)
I believe it is my smartphone use habits that have led me to have feelings of extreme worry and most times I become irritated or short-tempered whenever I am contradicted.	7.8% (n = 22)	25.4% (n =72)	23.7% (n =67)	38.9% (n =110)	4.2% (n =12)
The most important friend in my life is not anyone in my family or fellow students but my smartphone.	9.9% (n =28)	42.8% (n =121)	4.2% (n =12)	29.3% (n = 83)	13.8% (n =39)
My own life is now dependent on what I find displayed or proposed in Smartphone videos and online friends	8.8% (n =25)	39.9% (n =113)	17.0% (n = 48)	23.7% (n = 67)	10.6% (n =30)
Valid N	283				

As seen in Table 2, this study examined the outcomes of problematic smartphone use among students. Findings in item one revealed that 37.1% (n = 105) of the students agreed that they felt stressed that they have mental health concerns which are related to their way of smartphone use: like lack of self-control,

anxiety and depression, while 37.1% (n =105) of the students disagreed. On the second item, 48.1% (n =136) of the students agreed that their smartphone had led them to sleep fewer hours, and then they felt a lack of energy the next day, while 1.8% (n = 5) of the students strongly disagreed.

On the third item, 38.9% (n =110) of the students agreed that because of the many hours they spent each day on their smartphones they found that, they vividly suffered an unhealthy lifestyle when they are with others, while 3.9% (n = 11) of the students strongly disagreed. On the fourth item, 40.6% (n =115) of the students agreed that their smartphone habits had led them to frequently find themselves significantly alone and detached from their former friends, while 4.2% (n =12) of the students strongly disagreed. On the fifth item, 38.9% (n =110) of the students believed that their smartphone use habits had led them to have feelings of extreme worry and most times became irritated or short-tempered whenever they were contradicted. 4.2% (n =12).

With regard to the sixth item, 42.8% (n =121) of the students agreed that the most important friend in their life's life was not anyone in their family or fellow students but their smartphone, while 4.2% (n =12) of the students were not sure. On the seventh item, 39.9% (n =113) of the students agreed that their life was now dependent on what they found displayed or proposed in Smartphone videos and online friends, while 10.6% (n =30) strongly disagreed.

University counselors were able to provide their opinions on smartphone behaviours. When asked about what they thought of the outcomes of problematic smartphone use among students they have interacted with. In the interview, one of the counselors shared:

Addiction to the use of smartphones. Addiction to pornography, masturbation, gays and other forms of abuse of sex. Poor performance due to too much time spent on Smartphones. Trade e.g. Forex to make money which affects them. Gambling. Lack of spirituality. Unhealthy relationships end up being abused. Online writing to get income to go for gambling which ends up endangering their lives. We have lost students to femicide who were dated on phones and established relationships on phones. On the date of the first physical meeting, they are lured to booked houses where they are killed and their body parts mutilated (P2, female, 20th September 2024).

Another counselor added:

Sleep disturbance, some students share that they sleep few hours at night watching movies at night. Some have deteriorated in their academic performance due to overspending too much on their smartphones and cannot balance time to study and time they spend on their smartphones watching other things than studying. Others have developed withdrawal behaviors, had fewer face-to-face activities and found it hard to interact with their friends as they used before, they are always on their smartphones (P3, female, 21st September 2024).

In this study, 37.1% (n = 105) of the students agreed that they felt stressed that they have mental health concerns which are related to their way of smartphone use. These findings were supported by the findings of Song et al. (2022) who conducted a study in China and established that problematic smartphone use and sleep disturbance were linked to increased anxiety levels among students, which is a risk factor for mental health. The study demonstrates the positive association between problematic smartphone use and mental health, which can lead to elevated risks of anxiety and sleep problems among students. In addition, 38.9% (n =110) of the participants of the current study showed that due to the many hours students spend on their smartphones, they agree that they vividly suffer an unhealthy lifestyle when they are with others. The current findings were consistent with the findings of Twenge and Campbell (2023) who reported that students spend an average of 7 to 10 hours per day on their smartphones, with a considerable portion of this time occurring during social interactions. This usage often displaces physical activities and face-to-face communication.

The current findings were consistent with findings of Tandon et al. (2023), who reported increased smartphone use is linked to decreased physical activity levels and engagement with others. Students who

engage heavily with their smartphones report significant lower rates social encounter with others. The participants (40.6% (n =115) of the present study further agreed that their smartphone habits have led them to frequently find themselves significantly alone and detached from their former friends. The relationship between smartphone habits and detachment from others has become a significant area of study, particularly concerning how excessive smartphone use can lead to feelings of isolation and decreased quality of interpersonal relationships. Moreover, the findings were in alignment with findings of Rosa et al. (2023) who hold that heavy smartphone use is associated with a decline in face-to-face interactions, leading to feelings of social isolation. Students who spend more time on their devices report less satisfaction with their social lives. While smartphones facilitate online communication, they can also create superficial relationships. Studies indicate that students may prioritize digital interactions over meaningful in-person connections, contributing to feelings of loneliness (Primack et al., 2023). In addition, the findings are further supported by findings of Elhai et al. (2023) who highlighted that individuals who rely heavily on their smartphones for social interaction are more likely to experience depressive symptoms and feelings of loneliness, further detaching them from meaningful human relationships.

The current study also showed that 25.4% (n =72) of the students believe it is their smartphone use habits that have led them to have feelings of extreme worry and most times become irritated or short-tempered whenever contradicted. This resonates with findings by Ravindran et al. (2023), who found that constant notifications and alerts from smartphones can lead to heightened anxiety levels. Students report feeling overwhelmed by the need to stay connected and respond promptly to messages, contributing to feelings of extreme worry (Ravindran et al., 2023). This study's finding is also related to the finding by Elhai et al. (2023) which revealed that excessive smartphone use was linked to a decline in mental health, with students reporting higher levels of anxiety and worry.

The finding of this study agrees with that of Ayandele et al. (2020) in Nigeria. The study indicated a significant association between smartphone addiction and symptoms of depression and anxiety. Additionally, 42.8% (n =121) of the students in the current study held that the most important friend in their life was not anyone in their family or fellow students but their smartphone. Smartphones have become essential tools for students, serving multiple functions that facilitate their academic and social lives. One possible key reason why smartphone use is particularly important among students is getting access to Information. McCoy and Theis (2023) contend that one of the reasons students hold strongly on their smartphones is that they provide instant access to vast amounts of information. Students can research topics, access academic journals, and use educational apps to enhance their learning. This immediacy supports effective learning and helps students stay informed. There is the factor of social connectivity. Smartphones help maintain social ties, which are crucial for emotional well-being and support. Maintaining friendships and participating in social networks can reduce stress and enhance the college experience (Pantic, 2022).

The current study found that 39.9% of the students also stated that their life was somehow affected by what they find displayed or proposed in smartphone videos and online friends. The findings of the current study confirm the findings by Twenge and Campbell (2023) in the USA. The study found that 48% of the students felt their life was dependent on smartphones. Life dependency on smartphones and students is complex. Smartphones have become integral to students' daily lives, often used for essential activities like communication, navigation, and scheduling. This dependency can lead to a decreased ability to function without these devices (Roberts & David, 2023). Przybylski and Weinstein (2022) maintain that students increasingly rely on smartphones for social interaction, using messaging apps and social media to stay connected. While this fosters relationships, it can also create a sense of obligation to be constantly available, contributing to anxiety and stress.

The relationship between smartphone use and mental health, particularly regarding stress among students, has garnered significant attention in recent research. The evidence highlights that smartphone habits can lead to substantial detachment from meaningful relationships and increased feelings of isolation. While smartphones offer convenient communication tools, their overuse may undermine the quality of interpersonal connections, evidence suggests that smartphone use habits are closely linked to feelings of extreme worry among students. Factors such as constant notifications fear of being left out of social media engagement, and sleep disruption play significant roles in exacerbating anxiety (Ravindran et al., 2023).

CONCLUSION

The study concluded that smartphone use dependency among university students comes with negative outcomes in areas of mental health. Smartphone use dependency had caused them to regularly feel alone and disconnected from their previous acquaintances. Also, the students thought that their smartphone usage habits had caused them to experience considerable concern and that they frequently became agitated or short-tempered when contradicted. In addition, students stated that the most significant friend in their lives was not someone in their family or other students, but their smartphones. Furthermore, students agreed that their lives were now influenced by what they saw exhibited or advocated in smartphone videos and online friends. To mitigate these effects, interventions focusing on responsible smartphone use and promoting healthy coping strategies may be beneficial for students. The dependency on smartphones among students reflects a significant shift in how they interact with the world. While smartphones enhance connectivity and access to information, they also present challenges, including distractions, mental health concerns, and potential addiction. Balancing smartphone use with healthy habits is essential for maintaining well-being in academic settings. Future research should examine causes of smartphone dependency, including academic pressure, loneliness, social influence and personal habits.

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