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Do gender and age jointly or individually moderate the effects of cognitive and behavioral therapies on addiction to mobile phone calling behavior?

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ABSTRACT

Mobile phone technology has gradually become a part of higher educational experience, and almost every member of the university community uses or owns a mobile phone to communicate with others. Despite the many benefits that mobile phone accrues, the excessive use of them has resulted in the problem of mobile addiction. This study examined the effects of cognitive therapy and behavioral therapy in dealing with mobile phone addiction among students. The study employed the quasi-experimental (non-equivalent) research design, with a pre-test-post-test control group. Using the stratified sampling technique, sixty participants were selected for the study. An adapted test of mobile phone dependence with McDonald's omega coefficient reliability estimates of .82 was used for data collection for both the pre- and post-test. The hypotheses were tested using a three-way analysis of covariance. Evidence from this study was that, neither cognitive therapy nor behavioral therapy was efficacious in reducing addiction to mobile phone calls among university students. It was also found that neither gender nor age moderated the effects of cognitive therapy and behavioral therapy. It was recommended that counsellors should consider other psychological therapies to reduce mobile phone call addiction.

Keywords: mobile phone addiction, mobile phone calling behavior, cognitive therapy, behavioral therapy

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INTRODUCTION

A mobile phone is a portable technological gadget that aids users in making and receiving calls, text messages, among other features, notwithstanding their location. Beal (2010) defined a mobile phone as a wireless, multifaceted, portable device that helps connect to the Internet, make calls, email, text messages among others. It is usual to see both the young and the old using mobile phones in public places, colleges, universities, churches and at home. With the advent of mobile phones, the practice of writing letters to check up on friends and relatives, travelling distances to transact business and connect with people around the globe have reduced. This is because today, most people's reliance on mobile phone subscriptions which helps them connect to anyone instantaneously via the World Wide Web has swiftly surged. Studies report that most of the people in the economically developing and developed world use mobile phones (Kalba, 2008; Teo & Pok, 2003). In the early 2000s, the majority of cell phone users were from developed countries.

According to National Communication Authority (2013), 19,000 people used mobile phones in 1992 when mobile phones were introduced into Ghana. The number of Ghanaian users in 1998 and 1999 was 43,000 and 68,000, respectively. The number surged to 24.4 million in August 2012 (Eto, 2012). Due to the rapid increase of users, it is erratic to see someone with a mobile phone. At the moment, the use of mobile phones by young people is a global phenomenon. It is no longer a technological tool but a social tool because it has virtually become inseparable in the lives of many people especially young ones.

The popularity of mobile phones among university learners can be understood for their versatility. Students frequently use it for short messaging services, phone calls, games, downloading of ringtones, picture messaging, and WhatsApp messaging. In addition, students use mobile phones to listen to music, receive videos, record conversations, make video calls, access the Internet, and use bluetooth in sharing music. These behaviors gradually condition them to the use of phones to the extent that they show symptoms of behavioral addiction. The use of the mobile phone begins to interrupt their day-to-day activities, especially academic work. While some students may experience phantom vibration or 'ringxiety' (a false belief that your mobile phone is ringing or has received a notification, even though it has not) others are likely to develop nomophobia (a situation where they experience anxiety as a result of not having access to a phone) (SecurEnvoy, 2012).

The chances are that they develop social and relationship problems as a result of their dependence on the mobile phone (Lee et al., 2014; Leung, 2008; Matusik & Mickei, 2011; Oulasvirta et al., 2012). It is also reported that many sleep with their mobile phones while checking email, Facebook, or other social network sites. Brian (2013) also reported that learners after manipulating their phones, place them under their pillow. He added that learners suffer separation anxiety when their phones are not with them. The search for identity and the enjoyment of freedom positively reinforces these behaviors. Griffiths (2000) linked behavioral addiction to non-chemical behavioral addiction which includes human-machine interaction.

According to Griffiths (2005), excessive use of mobile phones does not necessarily mean addiction. The financial cost of some applications usually differentiates pathological mobile phone usage from some forms of mobile usage. High expenditure may be indicative of mobile phone addiction. This is reinforced by James and Drennan (2005), who reported that expensive mobile phone bills are one core negative result of addictive mobile phone usage. Bratter and Forest (1985) also argued that use and addiction can be differentiated by quantitative measures rather than qualitative. Addiction is determined in terms of the effect it has on the individual's social context and not by quantity alone. Students pay much attention to their mobile phones more than any other activity. This unlimited attention and the strong urge toward mobile phone usage, the interruptions it brings in household chores and the conflict it promotes between them and their parents on the amount of time they spend on their phones are all indications of mobile phone addiction symptoms (Griffiths, 2005). The negative health impact of mobile phones on humans have been adequately documented in the research literature. Again, a lot more of the researchers have used therapeutic interventions in dealing with or managing behavioral addiction. For example, some researchers such as Malak (2018), Rizeanu (2018), Shepherd (2010), and among others have used therapeutic interventions to treat variety of behavioral addiction. Interestingly, however, many of the researchers used cognitive-behavioral therapies (CBT) for the interventions. Much as the therapeutic approach was appropriate, the researchers also desired to investigate whether each of them, that is cognitive therapy and behavioral therapy, could independently influence mobile phone call addiction among university students.

Objectives of the Study

The main objective of the study was to determine the effects of cognitive therapy and behavioral therapy on mobile phone calling addiction behaviors of students. In addition, the study examined the moderating roles of gender and age of the participants.

Research Hypotheses

The followings were hypothesized:

1. **H1:** There is a significant effect of (i) cognitive therapy and (ii) behavioral therapy on the mobile phone calling behavior of students.
2. **H2:** There is a significant difference in the effectiveness of (i) cognitive therapy and (ii) behavioral therapy in reducing mobile phone calling addiction of students based on gender.
3. **H3:** There is a significant difference in the effectiveness of (i) cognitive therapy and (ii) behavioral therapy in reducing mobile phone calling addiction of students based on age category.

Table 1. Pre-test-Post-test control group design

Treatment	Group		
	Group A	Group B	Group C
Pre-test	O_1	O_2	O_3
Treatment	X_1	X_2	
Post-test	O_4	O_5	O_6

FooterWillBeHere

METHODOLOGY

The study employed the quasi-experimental research design, with a pre-test-post-test control group. Specifically, the non-equivalent type of quasi-experimental design was utilized. With this research design, the assignment of participants to the treatment groups was solely as a result of their membership in the intact groups, but not randomization (Leedy & Ormrod, 2010). There were three groups in the study, out of which two received cognitive and behavioral therapies separately while the remaining was the control group. The study targeted all the third-year undergraduate students in the 2019/20 academic year at the University of Cape Coast, Ghana. The cluster sampling technique was used to cluster the students into four colleges, out of which three were randomly selected using the simple random (lottery) method. For each of the three selected colleges, one department was purposively selected making three in all. The selected members of the three selected departments were assigned to the three groups, for which one group received cognitive therapy intervention, the other received behavioral therapy, and the last group was assigned the control group.

Table 1 presents the nature of the group assignment and the schedules of treatment. For ethical reasons, pseudonyms such as group A, B, and C were used to present the selected departments. From **Table 1**, O_1, O_2, and O_3 represented pre-tests, X_1 and X_2 represented the f_x treatments that were implemented, and O_4, O_5, and O_6 represented post-tests. With this design, the experimental group's A (cognitive therapy), B (behavioral therapy) and C (the control group) received the pre-test and post-test. Only the experimental groups (A & B) were offered the treatment.

Regarding the actual participants used in the study, all the students in the three selected departments were initially surveyed using Choliz's (2012) adapted test of mobile phone dependence (TMD) instrument. A cut-off score of 25 or more out of 50 was used as the benchmark for identifying those with mobile phone calling addiction. Twenty participants were then selected from each of the three departments using the stratified sampling technique. Gender and age categories were used as the stratification variables. The twenty students were then assigned to their various groups. For both the pre-test and post-test, the validated adapted version of the TMD was used for data collection. The coefficient reliability of the (instrument) mobile phone calling behavior was .82 and this was estimated using McDonald's omega coefficient reliability. The interventions were carried out in 11 weeks. For each week, there were two meetings, which lasted for 50 minutes each.

The hypotheses were tested using a three-way analysis of covariance (ANCOVA). The study had three independent variables, namely, group, gender, and age category. The pre-test scores were used as the covariate in the model. The post-test scores were used as the dependent variable. The choice of ANCOVA was because of its ability to control for the pre-test scores which was used as a covariate. ANCOVA adjusts for the post-test scores based on the pre-test, then these adjusted post-test scores were compared.

Table 2. ANCOVA test for effect of cognitive therapy and behavioral therapy on students' mobile phone calling addiction behavior

Source	df	Mean square	F	Sig.	Partial eta-squared(η_p^2)
Corrected model	18	42.574	1.040	.441	.313
Intercept	1	1304.496	31.866	.000	.437
Pre-test	1	.632	.015	.902	.000
Group	2	32.982	.806	.454	.038
Gender	1	206.753	5.051*	.030	.110
Age	2	12.437	.304	.740	.015
Group×gender	2	43.913	1.073	.351	.050
Group×age	4	13.146	.321	.862	.030
Gender×age	2	76.682	1.873	.167	.084
Group×gender×age	4	85.671	2.093	.099	.170
Error	41	40.937			
Total	60				

Note. *Significant, p<.05

ANCOVA is a powerful statistical procedure in the sense that it combines both analyses of variance (ANOVA) and regression models. This makes it robust in comparing across the groups of interest (Pituch & Stevens, 2016). The following assumptions were checked and adhered to normality, linearity, and homogeneity of regression slopes.

RESULTS

Table 2 presents the results of the ANCOVA test on the hypotheses. From **Table 2**, out of 60 participants in the study, 37 (61.7%) were males and 23 (38.3%) were females. There were 18 (30%) of the participants who were within the age range of 19-22 years. Also, 31 (51.7) participants were found within the age group of 23-26 years. Only 11 (18.3%) participants were 27 years and above. From the analysis of the age distribution of participants, it was found that the majority of the participants were within the ages of 23-26 years.

From **Table 2**, the results of the 3 by 2 by 3 between-groups ANCOVA showed no statistically significant interaction between group, gender, and age, $F(4, 41)=2.09$, $p=.099$, $\eta_p^2=.17$. Similarly, none of the two-way interactions, whether group and gender $F(2, 41)=1.07$, $p=.351$; group and age, $F(4, 41)=.32$, $p=.862$; and gender and age, $F(2, 41)=1.87$, $p=.167$ were statistically significant. Also, the main effect of group was not statistically significant, $F(2, 41)=.81$, $p=.454$. Based on the results of this study, there is enough evidence to uphold the null hypotheses for each of the alternative hypotheses raised. The implication is that the research hypotheses were not supported.

DISCUSSION

The findings herein indicate that neither cognitive therapy nor behavioral therapy being used independently was efficacious in reducing mobile phone calling addiction among university students. This finding contradicts Edjah and Ankomah (2020), whose study reported a significant impact of cognitive and behavioral therapies in the reduction of mobile phone addiction in general (a behavior that cut across the broad spectrum of various mobile phone addictive behaviors and not on the mobile phone calling addiction behavior as in the case of the present study) among students. Similarly, it also contradicts Hofmann et al.'s (2012) findings that cognitive therapy helps with many of life's challenges including anxiety, depression, and addiction.

It can be argued that antecedents that reinforce mobile phone calling addiction behavior may vary depending on the kind of addictive behaviors. For instance, what makes one addicted to the Internet surfing on the phone may not be the same as getting addicted to WhatsApp usage. It is, therefore, reasonable to have the same therapies function differently for different mobile phone behaviors. Invariably from the findings, cognitive interventions such as flushing out negative thoughts and behavioral interventions like positive reinforcements to unlearn unacceptable behaviors did not influence the mobile phone calling habits of students.

From the study, there was no gender difference, age difference, nor a joint difference of the participants who received cognitive therapy and behavioral therapy, compared with those in the control group. The results imply that neither gender nor age of students moderates the effectiveness of cognitive and behavioral therapies on the mobile phone calling behaviors. Maguire and Osman (2003) study corroborate the present findings by reporting that younger people used mobile phones mostly to socially interact whereas older people regarded mobile phones as a way to assist in emergencies. According to van Deursen et al. (2015), diverse social usage, greater self-regulation and stress make older people have a lower likelihood of developing addictive mobile phone behavior. Choliz (2012) also indicated that young people become dependent on the phone because of their vulnerability.

CONCLUSION

It can be concluded from the findings that the treatment of mobile phone calling addiction with the use of either cognitive therapy or behavioral therapy was not effective with students. Gender and age did not discriminate the mobile phone calling behavior of students. In other words, whether being male or female, young or old the therapies were not effective in dealing with students' mobile phone calling addiction.

Recommendations

Counsellors should consider the use of CBT to reduce mobile phone calling addiction since the therapy can complement each other to make it more effective in dealing with the addiction. The Counselling Center of the University of Cape Coast should educate students on how they can become vulnerable to mobile phone calling addiction. The Center should take advantage of the orientation programmes being organized by the Office of the Dean of Students at the beginning of every academic year to educate and support students who volunteer for

support. Counsellors in the university are encouraged to publicize at organized workshops that mobile phone calling addiction is critical for people of all ages irrespective of gender and encourage victims to come for treatment.

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REFERENCES

Beal, V. (2010). *The difference between a cell phone, smartphone, and PDA.* http://www.webopedia.com/DidYouKnow/Hardware_S

Bratter, T. E., & Forest, G. G. (1985). *Alcoholism and substance abuse: Strategies for clinical intervention.* The Free Press.

Brian, S. J. (2013). Two days with no phone. *Scholastic Action, 37*, 4-6.

Choliz, M. (2012). Mobile phone addiction in adolescence: The test of mobile phone dependence (TMD). *Progress in Health Science, 2*(1), 33-44.

Edjah, J. O., & Ankomah, F. (2020). Influence of gender and marital status on mobile phone addictive behaviors of students exposed to cognitive and behavioral therapies. *The International Journal of Humanities and Social Studies, 8*(11), 58-64. https://doi.org/10.24940/theijhss/2020/v8/i11/HS2011-021

Eto, D. (2012). *Over 24 million mobile phone subscribers in Ghana.* http://www.Itnewsafrica.com

Griffiths, M. (2000). Does internet and computer "addiction" exist? Some case study evidence. *Cyber Psychology and Behavior, 3*, 211-218. https://doi.org/10.1089/109493100316067

Griffiths, M. D. (2005). A components model of addiction within a bio-psychosocial framework. *Journal of Substance Use, 10*, 191-197. https://doi.org/10.1080/14659890500114359

Hofmann, S., Asaani, A., Vonk, I., Sawyer, A., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: A review of meta-analyses. *Cognitive Therapy Research, 36*, 427-440. https://doi.org/10.1007/s10608-012-9476-1

James, D., & Drennan, J. (2005). *Exploring addictive consumption of mobile phone technology.* http://smib.vuw.ac.nz:8081/anzma2005/

Kalba, K. (2008). The adoption of mobile phones in emerging markets: Global diffusion and the rural challenge. *International Journal of Communication, 2*, 631-661.

Lee, Y. K., Chang, C. T., Lin, Y., & Cheng, Z. H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior, and technostress. *Computers in Human Behavior, 31,* 373-383. https://doi.org/10.1016/j.chb.2013.10.047

Leedy, P. D., & Ormod, J. E. (2010). *Practical research: Planning and design.* Pearson.

Leung, L. (2008). Linking psychological attributes to addiction and improper use of the mobile phone among adolescents in Hong Kong. *Journal of Children and Media, 2*(2), 93-113. https://doi.org/10.1080/17482790802078565

Maguire, M., & Osman, Z. (2003). Designing for older inexperienced mobile phone users. In *Proceedings of HCI International.* Lawrence Erlbaum Associates.

Malak, M. Z. (2018). Internet addiction and cognitive behavioral therapy. In O. Senormanci, & G. Senormanci (Eds.), *Cognitive behavioral therapy and clinical applications* (pp. 183-199). IntechOpen. https://doi.org/10.5772/intechopen.71277

Matusik, S. F., & Mickel, A. E. (2011). Embracing or embattled by converged mobile device? Users' experiences with a contemporary connectivity technology. *Human Relations, 64*(8), 1001-1030. https://doi.org/10.1177/0018726711405552

National Communication Authority. (2013). *Mobile data subscription.* http://www.nca.org.gh/73/34/News.html

Oulasvirta, A., Rattenbury, T., Ma, L., & Raita, E. (2012). Habits make smartphone use more pervasive. *Personal and Ubiquitous Computing, 16*(1), 105-114. https://doi.org/10.1007/s00779-011-0412-2

Pituch, K. A., & Stevens, J. P. (2016). *Applied multivariate statistics for the social sciences: Analysis with SAS and IBM's SPSS.* Routledge. https://doi.org/10.4324/9781315814919

Rizeanu, S. (2018). Cognitive-behavioral therapy for gambling addiction. In O. Senormanci, & G. Senormanci (Eds.), *Cognitive behavioral therapy and clinical applications* (pp. 161-181). IntechOpen. https://doi.org/10.5772/intechopen.72671

SecurEnvoy. (2012). *66% of the population suffer from nomophobia the fear of being without their phones.* https://www.securenvoy.com

Shepherd, L. (2010). Cognitive behavior therapy for sexually addictive behavior. *Clinical Case Studies, 9*(1), 18-27. https://doi.org/10.1177/1534650109348582

Teo, T. S. H., & Pok, S. H. (2003). Adoption of WAP-enabled mobile phones among internet users. *Omega, 31*(6), 483-498. https://doi.org/10.1016/j.omega.2003.08.005

van Deursen, A., Bolle, C. L., Hegner, S. M., & Kommers, P. (2015). Modeling habitual and addictive smartphone behavior: The role of smartphone usage types, emotional intelligence, social stress, self-regulation, age, and gender. *Computers in Human Behavior, 45*, 411-420. https://doi.org/10.1016/j.chb.2014.12.039

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