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An awareness study on the health effects of modern mobile devices on the mind and level of thought of the child

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Abstract

Mobile gadgets, including laptops, PDAs, and mobile phones, have emerged as strong learning tools for both indoor and outdoor learning environments. Although there have been qualitative assessments of the usage of mobile devices in education, there haven't been any systematic quantitative analyses of the results. Today, every single person uses a cell phone. It is risky to utilize them without understanding their negative effects. There are studies on cancers caused by electromagnetic radiation from cell phones, but more research is needed, particularly on the negative physical and emotional impacts on heavy users like college students. This study examined the negative health impacts of children's cell phone use. The negative effects of technology use and how they affect children's brains and their socio-emotional, cognitive, and physical development have received a lot of attention as a result of this growth in usage. The majority of this research is in its early stages, particularly the brain-based research. Furthermore, it frequently demonstrates relatively weak correlations between technology use and kid outcomes; whether technology contributes to these outcomes is unknown, and weak effects raise concerns about children's real-world effects. Despite these problems, policymakers in many nations have established standards for children's use of technology that are frequently restriction-focused. They have been used for a variety of activities, including conducting business, having fun, and sending out emergency alerts, in addition to making it simple for people all over the world to connect.

Keywords: Cell phones; health effects, smartphones, mobile technology, health, children;

1. Introduction

Over the past 20 years, mobile computers have been steadily adopted into educational settings (Acharya, Acharya, & Waghrey, 2013). Most people now carry their own personal mini computers with remarkable computing capability, such as laptops, personal digital assistants (PDAs), tablet PCs, cell phones, and e-readers, thanks to mobile technology. One-to-one computing is a learning tool with significant promise in both traditional classrooms and outdoor casual

learning due to its significant processing power and portability, as well as its wireless communication capabilities and context-sensitive features (Ting Sung, Chang, & Liu, 2016).

In 1960s movies and television shows, it was usual to see individuals smoking. About fifty years later, with the advancement of scientific understanding on the harmful effects of cigarette smoking, the practice has mostly been restricted to outside areas, and the majority of smokers are conscious of the negative effects their behavior has on others (Adjei , 2019). This may be pertinent given the present ambiguity around the potential health risks of using a cell phone (C J , 2017).
It's difficult to find someone today who doesn't own a cell phone. The mobile phone firms have today introduced a wide range of cutting-edge phones. They come with a ton of features that serve both personal and business purposes well (C J , 2017).

Communication and learning new things are made easier by mobile phones. Mobile devices facilitate group learning and ongoing discourse regardless of one's physical location, advancing the process of knowing, which happens through conversations across settings and among different people (Wilmer, Sherman, & Chein, 2017). Through dialogue using mobile technology, students work out disagreements, comprehend the experiences of others, and develop shared interpretations of the world (Chu, Qaisar, Shah , & Jalil , 2021).

Despite considerable knowledge of the harmful health impacts of cell phones, their use has skyrocketed, particularly since they became more widely available and more reasonably priced. In a developed nation like the USA, between 86 and 90 percent of the population uses a cell phone, and a sizable portion of these are in school or attending college (Foen Ng, Che Hassan, Mohammad Nor , & Malek, 2017).

This reliance on technology has fueled worries from parents, educators, governments, and even young people themselves that social media and digital technologies are aggravating feelings of anxiety and depression, interfering with sleep cycles, encouraging cyberbullying, and distorting body image. Some nations are acting in response to these and other issues (Ting Sung, Chang, & Liu, 2016). While the UK government is examining how social media affects children's wellbeing and how much screen time is healthy, legislation in Korea prohibits kids from playing online games that require a resident registration number between the hours of midnight and six in the morning without parental permission (Fowler & Noyes , 2016).

Research on this has been prioritized by organizations like the World Health Organization (WHO). Even though studies in adults tend to demonstrate weak or non-causal associations between radiofrequency exposure and brain cancer and various head tumors, the argument over the risks of radiation exposure has become particularly prominent (Mani , 2019). There is some evidence linking increasing mobile phone use, particularly on the side of the head chosen for cell phone use, to a higher chance of developing various cancers, such as glioma, a cancer of the glial cells in the brain or spine (Organisation for Economic Co-operation and Develop, 2019).

The daily working routine, productivity, physical health, social interactions, and emotional well-being are all negatively impacted by excessive mobile phone use. A recent study looked at how stress is brought on by excessive mobile phone use. Cognitive emotional preoccupation is caused by the constant consumption of news and information, attention-demanding social networking sites, work activities, and various forms of entertainment (Theodora Tanil & Hooi Yong, 2019). The users' long-term memory begins to form clusters as a result of cognitive emotional preoccupation. These clusters have potent impulses that affect behavior, including mental and emotional responses (Organisation for Economic Co-operation and Develop, 2019).

2. The Objective

In light of this background, the main objective of this study was to examine the relationship between mobile device usage and health. The goals of this study were specifically as follows:

- To provide an overview of the current state of mobile device use and its impact on health, including information on who uses them, what domain subjects are taught, and what types of mobile devices are used
- To calculate the total efficiency of mobile technology integration and its impact on kids' academic success using mobile devices has an impact on your health.
- The purpose of this study is not to discourage people from using mobile phones, but to raise knowledge of the risks associated with the radiation they generate so that people can take appropriate safety measures. The increased use of mobile phones raises the possibility of electromagnetic radiation exposure risks to both humans and their offspring. Depending on how long you use your phone, these impacts could differ.
- To determine if there is a substantial difference in the level of health awareness

3. Related works

The purpose of this study was to evaluate some of the effects that children's self-perceived increased cell phone usage had on their wellbeing. And as the following some related studies:

In (Fowler & Noyes , 2016), they presented the study about the use of mobile phones is expanding globally. The effects of young users' mobile phone use on their physical, cognitive, and social health are taken into account. It is reported on a survey of 136 children aged 11 to 14 and 168 youngsters aged 8 to 11. In order to obtain more detailed information regarding reasons for using mobile phones, participants filled out questionnaires about their use of these devices. According to research, mobile phone users run the danger of developing muscular skeletal issues, radio frequency harm from keeping their phones close to their bodies, especially when they're "on the go," and decreased performance due to multitasking and sleep disruption.

In (Acharya, Acharya, & Waghrey, 2013), they proposed the study about College students from both urban and rural origins, aged 17 to 23, of both sexes, were chosen at random (those using cell phones). A self-administered, pre-tested questionnaire was given to them that covered topics relevant to a few widespread negative mental and physical health symptoms linked to cell phone use. Cell phones were owned and utilized by nearly all of the participants (96.1%), as was expected, throughout the majority of the day. The most frequent symptom was found to be headache (51.47%), followed by irritability/anger (50.79%). Other typical mental symptoms include difficulty focusing, subpar academic performance, anxiety, etc. Body aches (32.19%), eye strain (36.51%), and digital thumb (13.8%) were discovered to be common physical complaints. Driving while using a cell phone results in accidents.

In (Foen Ng, Che Hassan, Mohammad Nor , & Malek, 2017), they discussed This study looked at the degree to which students at one university in Malaysia utilize their smartphones to help their academic learning and how this correlates with their grade point average. 176 students from three academic programs tracked their daily smartphone use for learning over the course of seven days. The use of smartphones varied significantly depending on the academic curriculum. In addition, it was shown that students' CGPA decreased the more they used their smartphones for academic purposes. The findings of this study point to the necessity to assess and comprehend the educational applications of cellphones for tertiary students.

In (Shoukat , 2019), they included the study about studies on smartphone use and its effects on all teenagers have been conducted. It is by no means a recent problem. However, the rising prevalence of cell phone addiction and the unfavorable psychological and physical health of teenagers compelled me to write

this letter. Various human behaviors have been used as the dependent and independent variables in numerous studies. Some researchers compared adolescent smartphone addiction to their physical health or academic achievement, while others looked at their social interactions and psychological behavior. These articles reviewed some of the most recent studies.

In (Theodora Tanil & Hooi Yong, 2019), they presented the study about goal was to look at how having a smartphone affected undergraduates' learning and memory. 119 college students in all completed a memory exercise and the Smartphone Addiction Scale (SAS). As expected, those without cellphones outperformed those with smartphones in terms of recall accuracy. The results revealed a substantial inverse association between memory recall and phone conscious thinking, as measured by "how often did you think about your phone," but not between SAS and memory recall. Conscious phone thought significantly predicted the accuracy of memories. We discovered that having a smartphone nearby and having a high phone consciousness affects one's memory learning and recall, demonstrating the detrimental effects of having a smartphone nearby on our learning and memory.

In (Wilmer, Sherman, & Chein, 2017), they discussed the study about identify the functional domains in which there is growing evidence of a significant relationship between smartphone technology and cognitive performance, as well as the functional domains in which the scientific literature is not yet mature enough to support any firm. The review takes into consideration an expanding, though still limited, area of research exploring the potential cognitive impacts of smartphone related habits. We concentrate our review primarily on three aspects of cognition: attention, memory, and delay of gratification, which are clearly implicated in public discourse about the effects of mobile technology. We then take into account evidence regarding the broader relationships between smartphone usage and regular cognitive functioning.

In (Chu, Qaisar, Shah , & Jalil , 2021), they reposed the study about cognitive emotion preoccupation as the fundamental mechanism through which mobile phone distraction results in a decline in psychological well-being is a significant contribution to the research. Distraction-conflict theory, which shows that users with excellent attention control are better at coping with the negative effects of mobile phone distraction, supports the proposed paradigm. Utilizing statistical procedures, the data, which consisted of 914 university students in China, was examined. The findings suggest that cognitive emotional preoccupation—which has a detrimental impact on users' psychological wellbeing—had a substantial positive connection with mobile phone distraction. Our findings also show that cognitive emotional preoccupation in relation to mobile phone distraction and psychological well-being was controlled by attention control.

In (Adjei , 2019), they discussed the study about investigate how and why smartphones are used in distant learning at the University of Ghana. The survey had a total of 294 respondents and was based on the Technology Acceptance Model (TAM). For the study, a survey research design and questionnaires were used. The study's main goals were to determine how easily students thought a smartphone could be used for learning activities, how useful they thought it was for helping students achieve academically, how using a smartphone affected learning activities, and what obstacles might prevent students from using a smartphone as a learning tool.

In (Singh Yadav, 2021), they presented the study about Mobile phones today have a limitless amount of resources with several uses and advantages. Teenagers' conduct may change as a result of its excessive use, and their academic performance may suffer. This study investigates the association between teenage mobile phone use, behavioral changes, and academic accomplishment. At chosen schools in Rishikesh, Uttarakhand, India, a descriptive correlational study involving teenagers (n = 285; males: 210; females: 75) was carried out. A behavioral Likert scale was utilized to analyze the behavioral changes through self-report, and the test of mobile reliance was employed to gauge smartphone dependence. School records were used to assess academic performance, and a proportion of the results from the previous two exams was taken into account. Utilizing both descriptive and inferential statistics, the collected data were examined.

In (Mani , 2019), they discussed the study about Even though mobile phones are improving economies and society, little is understood about the negative consequences they may have on both individuals and the environment. The Life Cycle Assessment (LCA) of mobile phone technology is a growing area of research that examines the health risks to workers involved in extracting the raw materials (metals and solvents) used in their manufacture, the health risks to workers during the production of the various components (plastics and heavy metals), the risks to consumers, and the risks to the ecosystem when the phones are discarded in a landfill or burned in an incinerator.

4. Materials and Methods

This study used a correlational research design and a quantitative methodology. It sought to describe the chosen demographic traits and identify connections between smartphone use and the health of children.

The normative survey method was used for the current investigation. The purpose of the survey approach is to gather in-depth descriptions of existing phonon with

the goal of using the information to either support present circumstances and practices or to come up with more clever strategies for their improvement. Survey methods' goals include analyzing, interpreting, and reporting on the state of recurring events and assessing the sufficiency of status by contrasting it with predetermined standards. The survey is a crucial research technique. It calls for knowledgeable and creative preparation, meticulous analysis, and skillful reporting of the results.

The following tools were employed in this study:
1. The prevalence of mobile phone use
2. A health risk assessment of cell phone use

Not just among teenagers, but also among other age groups, technology use is on the rise (Singh Yadav, 2021). According to research, preschoolers acquire accustomed to digital devices before being exposed to books. Increases in use and younger ages of initial access are predicted by global trends. Although the body of knowledge specifically pertaining to how children under the age of 8 use technology is relatively thin, there has been a proliferation of research exploring potential links between emotional well-being/mental health outcomes and technology use in children in response to this increase in recent years. In any case, the majority of the published research is correlational, exhibits modest effect sizes, and lacks clarity regarding the underlying mechanisms causing these results.

Because television has been around for a long time, there is a sizable body of literature examining television and kids. The effects on language skills as well as cognitive, physical, and emotional development have been studied by researchers (Shoukat , 2019). The number of researches in this area is greater than the quality, though, as many studies claim very modest effect sizes, are correlational in nature (and therefore unable to demonstrate causality), and present a great deal of contradictory "evidence" even when analyzing the same datasets. Consequently, results in this field should be evaluated with care. This section offers as a summary of some of the research on television viewing and child outcomes, as well as some of its drawbacks.

5. Results and Discussion

It was shown that many kids felt unwell as a result of the ongoing stress that cell phones produced in their daily lives. People indicated that they experienced regular headaches, neck discomfort, limb pain, back aches, redness in their eyes, and ringing in their ears on some days as a result of using their mobile devices nonstop.

According to descriptive statistics, 72% of children aged 8 to 10 have access to a mobile phone. All but one participant in the 10–12 age range (79%) owned a mobile phone. The 8 to 10-year-old participants made three to four calls on average each da, they send 10 texts every day. According to the findings, 11 to 12-year-olds make an average of 19 calls a day. With a range of 0 to 300, the 10–12 age group sends roughly 30 messages each day.

The data mentioned above show that nearly equal numbers of subjects. This was done to eliminate any potential "bias" brought on by the presumption that youngsters are more aware of the negative consequences of cell phone radiation than their engineering and other equivalents.

The best ways to structure children's screen time and how it should fit into their daily life, as well as how to understand the most recent research on these topics, may be unclear to parents and guardians as well as education and child health professionals. Coherent guidelines are therefore required in this area. The most recent and rigorous social science research should be supplemented with information from the biological sciences as well to create a more complete picture in order to develop useful and evidence-based guidelines.

Although neuroplasticity is not inherently good or negative, it is crucial to remember that it is a fundamental aspect of learning. Different results may occur depending on the size and location of the alterations. It is also important to remember that "significant brain alterations, equivalent to what is represented by the phrase ‘rewiring the brain' are unlikely." Additionally, genetic factors significantly influence how the shape of the brain changes during childhood and adolescence.

6. Conclusion

These results will aid in a better understanding of how, where, and for whom mobile device use in the learning environment will best highlight the outcomes of specific instructional strategies and expose the drawbacks of mobile device use in education. The way that individuals communicate and plan their lives has been significantly impacted by the mobile phone. This research study has shown how much time and effort this age group of 8 to 14 spends on their mobile devices. The research demonstrates that there are a variety of physical, cognitive, and social health issues related to young people's usage of mobile phones when compared to the body of literature on health risks. This implies that young users should exercise caution when engaging in excessive usage, particularly with voice calls. Many of the long-term implications are also unknown at this time. Although some information was gathered from the interviews, this study did not question directly about how much time young users spent on their mobile devices. Some of

the take-home messages recommended to the subjects to reduce and prevent the negative effects included less reliance on the device, reducing time spent talking, communicating more by texting, holding the device as far away from the head as possible, using headphones or loudspeaker technology, etc.

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