

Health Issues Related to Chronic Exposure to Digital Gadgets and Online Learning - An Analysis

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Abstract: *The prevailing pandemic situation has imposed social isolation to prevent the spread has yielded positive results globally. In India also serious attention is focused by the Central and State governments and all educational institutes are closed for more than an academic year. To continue the education system instead of face to face pedagogical system virtual mode of education was promoted. For the online or virtual mode of teaching and learning digital gadgets particularly mobile phones are maximum used. The school going children from the of KG to 10+2 class are using the online mode of class conduction. The small i - kids in the tender age are also compelled to listen the classes through mobile for hours together. But there are several complications behind the use of mobile phones for long hours. The radiations from the digital gadgets were proved to cause digital toxin to human system. Besides a lot of psychic - social environmental aberrations are caused among the children due to this mode of learning. To save the Indian children the future of our Nation from possible health and social hazards in the years to come some alternative teaching technology must be developed. With this central dogma the proposed study, a blend of review and personal data collection emphasizes the imperative need for a change in the online mode of education to school children.*

Keywords: Virtual teaching, online education, perils of mobile learning, digital toxin

1. Introduction

In the current pandemic period, a shifting from classroom learning to virtual learning gets more attraction. From the Pre - KG students in the tender age of 3 years to all adult learners in higher education have to accept this transition in educational domain. This transit from conventional pedagogical system to on - line learning may apparently look attractive, nice, cost - effective, flexibility, safe from infections and many other short term benefits. Millions of children are at increased risk of harm as their lives move increasingly online during lockdown in the COVID - 19 pandemic [1]. But its impact on the younger generation, family and society needs to be addressed in terms societal impact and health care on long run. For several thousand years our physiological system is adapted for a particular way of learning and a sudden mutational change in the education system will be accommodated by our physiological system needs an in - depth study. Learning does not mean that just a visual or audio communication behind this digital communication. In this process, the endocrine functioning, neural networking, impulse conduction, vision and brain co - ordination have to work together to recording, retaining and recalling during examinations. . The digital device used for learning must be safe also. But a lot of research work concludes that the electromagnetic radiation associated with digital gadgets including Wi - Fi, holding the device like mobile phones for a long time leadsto stress to retina and optic nerve to view the image in small screen. The master gland pituitary and dependent several other endocrine organs too get unusual stress. The sedentary stay with mobile for long hours and stress to cervical vertebrae while listening are to be analysed. A school provides structure, support, and a system of rewards and penalties to groom its students. Traditional classroom education offers the benefit of face - to - face interactions with peers which are typically moderated by a teacher. It provides children, especially those in their early

developmental years, with a stable environment for social interactions, helping them develop skills like boundary setting, empathy and cooperation. It also allows plenty of room for spontaneity, unlike a virtual learning setup [2]. A personal enquiry with 100 parents of students in various stages of learning found that 80 percent of the parents are saying their wards health, societal movements, good peer group missing and timely briskness are lost. Above all nearly 56 percent of their wards are much interested to view other social media including pornography though their mobile or other devices. [3].

This attitudinal change imposed upon the children will yield negative impact when they become teen age and post teen age stage. Nearly 38 per cent adolescent students have become addicts to social media and wasting their time. Thinkers bank gets diverted and perverted youth both boys and girls are increasing. So with despair to see the behaviour of these e - kids in another 10 to 15 years, the author feels imperative to sensitize the learners, teachers and the parents about the perils of this mode of learning. In the COVID pandemic and the necessity to keep social distancing virtual class is unavoidable. According to Lederman (4) due to the COVID - 19 crisis teachers and students were compelled to embrace the digital academic experience as the common platform online teaching - learning process [4, 5]. But in school educational system in countries like India where free government and government aided schools are dominant some alternative teaching technology without using mobile, laptop or note book or blending of other teaching technologies could have to be implemented. Most of the private schools with self - supporting system the deterioration of social value and culture are more deteriorating as their parents are afford to provide good smart mobile to their children as a status symbol. They never bother about the content their children is following in the smart phones. In view of this the present article a blend of

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review and interviewed data are made to focus the reality of internet based learning for school students.

2. Material and Methods

In the present study using standard questionnaire 100 parents of school going children were interviewed and their reply was analyzed. Also several research work and information available in social media were analysed during May 2020 to June 2021.

3. Result and Discussion

Radiational Hazard from Digital Learning Tools

The web tools used for virtual learning includes mobile phones, laptop, i - pad, note pad personnel computers etc., Wi - Fi ambience, networking Units, Wi - Fi routers etc. The mobile phone is the major tool for on - line course to 90% - 95% of the users. Mobile phones particularly smart phones are used by many people including most of the children from the age of 3 years. The amount of radio frequency (RF) energy our body absorbs while using the mobile phone is called Specific Absorption Rate (SAR). There is a limit for the maximum RF our body can tolerate when making a call. Most experts say that the safe SAR value of the mobile phone the consumers use must be in range of 0.10 - 0.50. Although the SAR value of the mobile gadget is given in the instruction sheet, many consumers never bother about it. Even the highly branded smart phones mention the maximum SAR value of their products as 1.6 or above must be checked whether this is the limit in all phones in realistic application when 3rd generation (3G) and above that (4G, 5G) are used [6].

The safe SAR value per kg of body weight is must be less than 0.50 watts per kilogram of body weight. But most of the phones available in the market particularly the Chinese brands are above 1.3 as per their declaration in the sheet. Imagine the tolerance SAR limit for the body and children who are addict and regular users during E - learning. Many mobiles in our Indian market has SAR values above 0.5, the safe level. To avoid the harmful radiations from smart phones including i - phones, i - pad, notepad etc., Food and Drug Administration (FDA), Federal communication commission (FCC) have given several precautionary measures to protect the users. The safe distance between the device and the user, the amount of time one can use at safe level. According International Agency for research on cancer (IARC), WHO because of heavy use of mobiles with high SAR value leads to Electromagnetic hyper sensitively (EHS) [7, 8]. The EHS value varies from person to person and its impact varies with individual. It is reported that EHS increase leads to hyper reactivity in the central nervous system and imbalance in autonomic nervous system. The Federal Communications Commission [FCC] USA, advise mobile conversation to be under 30 minutes and keep the device it at a distance of a feet during video communication. Prolonged use of mobiles by children during E - learning everyday will definitely be a slow digital toxin to the wellbeing. Till today the scientific society is evading to tell the truth [9]. Further the mobile with single sim card operation reduces SAR value. Imagine whether the poor

Indian children from illiterate and first generation learners can afford to buy a handset having less SAR value.

Also whether the institutions offering e learning will allow the LKG, Pre KG, KG and lower class student to use their mobile for 1 or 2 hours a day is a serious issue. From our personal observation many women using cell phone for a longer time every day are affected by vertigo and cyber dizziness. This digital motion sickness leads to the sensation that the things around are spinning as if the room is moving, loss of balance, severe head and neck problems, nearly fainting conditions. This cyber sickness was observed in many women than men. According to Dr. Allison, Audiologist of university of Arkansas for medical sciences the use of cell phone exceeding 60 minutes per day damage the hearing function. According to a recent study Dr. Hans - Peter Hutter of the Institute of Environmental Health at the Medical University of Vienna, long duration of mobile use affect cochlea in ear and cause tinnitus with stress sleep disorder anger, anxiety and depression. Our kids on continuous exposure to cell phone antenna with high RF may develop glioma and acoustic neuroma in the long run. All the above mentioned studies were observed in adults in such situation if we allow children below the age of 10 years; definitely the child will face many problems in the future. Will our children below the age of 10 follow the safely standard for cell phone operation?

Viewing mobile platform and blue light exposure

RaivBatii in his information in Health line Sept 2, 2020 reports that blue light from cell phone, laptop or other hand held devices are toxic for the eyes. Scientists at University of Toledo , USA discovered how a blue light from digital devices lead to macular degeneration – one of the leading causes of vision loss in the united states. Macular degeneration is due to the damage in the photoreceptor in retina. The continuous look at the screen of the mobile, laptops or digital screen related blindness may rise to one tenth of the global population in 2050 according to a study published in progressive optometry. During E learning the kinds, teens and adults have to focus their eyes on a small screen or one place for a long time in close range makes many changes in vision physiology and strains to the eye. The constant focus of eyes continuously on the digital screen during online learning for a long time every day regularly throughout the academic period will definitely lead to myopia, dry eyes, tired eyes, blurred vision, poor secretions form lachrymal glands in addition to neck and back pain.

During virtual classes how many kids and children are in proper sitting – viewing postures in their home when several low income families cannot provide a study table and a chair for their kids. The high energy visible light from web tools used for learning affect the sensitively of the eyes. The constant and continuous starring at the digital divide screen, and serous brain and vision coordination to make an input of that day e - learning in the brain will definitely affect the vision in the near or long run.

Such “e – learning vision syndrome” can be minimized by wearing eye gears or keeping the devices at a safety range and following 20 - 20 - 20 rules. A kid listen the e - class must follow 20 - 20 - 20 minutes rule while listening the

next day the parents may have to pay e - fine to the school. How many kids or their parents know the art of viewing their mobile or laptop or other device with safety by vision council, USA, 27 - 35% of Americans suffer with blue light emission syndrome due to digital devices. Blue lights are high energy light with short wave length. There are certain precautionary steps to reduce the computer vision syndrome but our digital i - kids will not follow. Scientists at University of Toledo, USA discovered how a blue light from digital devices lead to macular degenerate with parents. Parents of the e - learners to - day must closely watch the health of their kid's eye.

Neuroendocrine co - ordination

Viewing the lesson taught through online classes does not only involve the receptor organs like eye and ear, but behind it the impulse has to be conducted via the neuro system to the brain for recording. During this visual or audio learning through a small sized digital screen, Pituitary system also plays a role. Learning and memory are neuroendocrine regulated behavior. When an e - kid feels a stress due to internet problem or device problem in their or institutional source create an emotional stress. Further when there is a switch over from group learning in the rooms to isolation learning ambience cause concentration and competitive problems. Further the sedentary life at home, no physical education class at home, no energy spent as in regular school time, no peer groups, constant pressure from parents co learners, no class teachers to solve doubts in subjects like Maths or other science subjects, lack of regular program activity schedule during school going etc. are changed. This isolation without peer group friends also gives stress and endocrine related functions. Uncontrolled food intake, no energy output made many of the students in the lockdown period becomes obese also. This may lead to diabetic and other hormonal problems.

Sexual perversions

The adolescent boys and girls and even adults have become addicts to pornography sites in the internet. As parents can't track their internet usage or mobile they become victim to pornography, social network friends, addict to stressful video games, gambling, anti - social activity, You tubes, and illegal digital relationships [10]. The post recovery from such lockdown digital learnt vices after the regular class room learning will be stressful for teachers, parents and institutions. A report says many college students are purchasing sex - toys through on - line purchase [11]. There are reports in Tamilnadu about teacher misbehavior in online classes [12]. The adult stores sales are reported high during this period. It is reported India has reported 95% spike in traffic to adult sites during the early COVID period in May and June. Why online classes may not be such a good idea after all, especially for kids Online lessons have emerged as the go - to solution for schools looking to resume classes despite lockdown. But experts are worried

Mobile phone radiations and Infertility

There are many research work confirm that the radio frequency electromagnetic radiations emitted (RF - EMR) from mobile phone affect male reproductive functions [13]. Long term exposure to 900 MHZ RF radiation affected the reproductive functions in experimental animals. The RF -

EMR beyond tolerance level induces Oxidative stress in mitochondria. Dr. Amit Green and his team in Tel Aviv - Institute of Sleep and Fatigue declares that the use of smart phones and tablets reduce sperm quality. The long hours of exposure to cell phone and its close proximity during the use induces RE - EMR exposure and sperm dysfunction. Many human and animal studies have shown that spermatozoa exposed to EMR emitted by mobile phones had reduced motility, structural anomalies, and increased oxidative stress due to overproduction of reactive oxygen species. Also scrotal hyperthermia and increased oxidative stress due to EMR affects male fertility. However, these negative effects appear to be associated with the duration of mobile phone use [14].

Shift in teaching mode

The educational domain is making a lot of change in the teaching methodology. Because of the advent of Information and communication technology, even from pre KG classes to higher education made it mandatory for all its stake holders to learn the subjects through virtual classes one may think that the virtual learning using web tools are good. Yes it is true on onside but the impact of exposure to web tools used for learning can make a serious health issues in the latter days of the learner. Many are not aware of the health problems the virtual class attendees in latter part of their life. The virtual classes are having its own advantage, but in countries like us where people are not able to purchase good web tools for learning and other economic burden, un aware of precautionary health issues before attending the virtual classes are important matters to think about. How many of our kids from different economic and social background will sit in front of a web tool for listening to the class. Even now in our survey 30 - 35% of the students are attentive in listening the online classes. The teachers too from several schools are not updatave in using web tools for delivering lectures. Some deliver through already prepared texts via you tube channels or ppt. In some classes only voice of the teachers are available and not his image. It is more or less like a dump show. In such situation an intervention is needed to operate the present on line classes. Besides with several risks the students are listening to the classes conducted through online.

Health issues

The kids from the pre KG kids at tender age to the adults doing higher education spend more than 3 hours to 6 hours to listen the lectures or teaching given via web tools. Sometimes they may have to sit continuously or with intermittent intervals. The web tools used by them include PC, Laptop computers, i pads, mobile phone or other electronic gadgets. More than 60 percent of the students use android / apple phones. The students sit in front of the device that is giving health problems in the long run. The Wi - Fi ambience too is hazardous for long time and long term exposure. If a family has 2 - 3 children in a family is attending the online classes in small rooms in the house stimulate the entire room with unseen radiating electromagnetic wave clouds. All the tools used by the students (Mobile phones, Notepad, L pad, PC, Laptop, Wi - Fi routers, Wi - Fi units) etc. emits electromagnetic radiation and heat. Continuous exposure to the web tools, electronic pollutants may induce many hormonal changes,

physiological changes, biochemical alterations and even cellular modifications particularly in young girls and kids. There are many scientific reports about the perils of radiation from mobile phone, Wi - Fi, Computer, note pad or other devices [15].

General defects in Online Learning

Online learning is increasing in popularity each year because of its flexibility, unlimited array of option, multimedia option, reduced cost etc. But reality many of the advantages believed is not real. Regarding cost cut, in many schools they have increased the additional burden of online teaching fees. Education methods are changing today. After the advent of Information and communication technology (ICT) web based education is dominating in all academic and other sectors. The replacement of class room teaching with virtual learning the human intimacy between teachers and the students are folds higher.

Further thousands of teachers are going to lose their jobs. The major problem in our garden system of education is un - matching between theory and practical classes. Without practical for the taught theory subjects in science domain is a severe waste and we will produce theoretical graduate without seeing or operatory an instrument. Virtual classes cannot replace face – face class in several aspects. It is an offshoot of distance learning education programme. It was introduced in 1800s by the University of London. One line education has made many educational school owners as multimillionaire. For example if 1000 students are studying in a school having courses from pre KG to higher secondary state board, Metric, ICIS, CBSC, International and others, an average minimum annual income will be around 10 Crores of rupees. If classes are conducted through online, there is no need for a student – teacher ratio. An expert can handle many classes at their convenience or telecast their preparation through you tube, What's App or other sources. Ultimately with a very less expenditure for payment for teachers, and administrative workers educationalists have become entrepreneurs. If classes are conducted virtually there is no need to spend money to maintain playground, class room, wash room, transport, electricity bills and hostel expenses etc. So with a mere 10 x 10 feet class room with audio - visual facility each school is going to earn money, at the cost of the livelihood of teachers, and health of the stake holders. So the psycho - social balancing and other domains are to be analyzed in depth. From private schools having pre KG classes to higher secondary classes has now taken their online classes as a tool for their advertisement and pocket – filling source. What about the fate of millions of children from villages and tribal settlement learning in government and government aided schools? Most of the self - supporting school has made education as a business like a multinational company earning several lakhs of rupees without tax. Most of the schools in addition to regular fees demands fees from students under several other heading like books, magazines etc. Further the final marks for 10th and 12th students are decided by the schools only and it has led to corruption and many parents are on the move to purchase the marks. If so what will be the quality of education during the pandemic period and on what basis they will be admitted in professional courses without any real screening tests. So the virtual education at school level in our Nation has reduced

the progress of talented students from poor socio - economic set up and made many students a mere mark buyers not a mark scorers.

4. Conclusion

In the changing digital revolution –e learning has become inevitable. For virtual classes different types of operation gadgets like, mobiles, tabs, laptops, desk tops are used. But many children of low economic strata prefer mobile units to other devices. The Wi - fi and other supporting devices of low budget range are used by many. The continuous exposure to the radiations from digital gadgets, light and constant vision in a small screen can induce changes in the pituitary system that controls several other endocrine systems. So the continuous exposure to electronic devices affects endocrine system and related reproductive system besides vision. All on - line users are advised to use standard devices and follow 20 - 30 minutes work and 10 minutes relaxation. Also the distance between the screen and the eyes must be as per health standard. Keeping lap top close to genital system is also dangerous to reproductive system.

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