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## Research Article

### DIGITALIZATION AND CHANGING SCENARIO OF HEALTH

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#### ABSTRACT

Worldwide technology and its changes play a major role in each individual's life. The current trend of the society is to adopt every change in the field of communication technology. The mobile phones are boon of this century. The effects of digitalization with respect to health has been discussed in this article with remedial measures that can be adopted in order to have increased beneficial effects rather than addictive behaviors or altered physical and mental health conditions. The advantages include increase in knowledge about various diseases and their preventive aspects, disaster preparedness, screening of diseases and increase in the number of e-participants. The disadvantages include various elements like musculoskeletal disorders, sleep disorders, behavioural changes, internet addiction, effect on brain, trouble in cognition, obesity etc. Preventive measures for reducing the adverse effects on health can be limitation in the use of digital devices according to the place of use.

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#### INTRODUCTION

Digitalization is the using of digital devices in our day to day activities which are an integral part of our life these days. Digital devices include computers, calculators, digital watches and clocks, automotive electronic systems, and most telephones, microwave ovens, video cassette recorders, and security alarm systems. (1). The age group of 16-18 years using Smartphone's have shown a rapid rise from 5% in 2012-25% in early 2014. Recently in 2013, there were around "51 million" Smartphone users in Urban India and rate of rise from year 2012 was 90% (2). Health sector is not uninfluenced by these digital gadgets and these are becoming quite inevitable. Medical undergraduates, thought of not being much involved with technology like hard core technical streams are now-a-days rampantly using these devices. (3) In addition to telephony, modern-day mobile phones also support a wide range of other services such as text messaging, e mail, internet access, short-range wireless communications (infrared, Bluetooth), business applications, gaming and photography. Today, Smart phones with more advanced computing facilities have come into the market. (4) Hence this review article focuses the benefits and the adverse effects of digitalization on public health; solutions how to mitigate its effect on human health and life.

#### Advantages

With context to public health, the beneficial effects can be explained by the increase in knowledge about various diseases and their preventive aspects like swine flu, dengue fever, Japanese encephalitis etc. Many patients know much about the symptoms they have and the probable disease they might be having, before he visits the physician for treatment by the use of internet. This has a positive effect on health with respect to the knowledge about the disease but the information gathered might not be sufficient enough to address the disease and reach at an appropriate diagnosis. Use of digitalization also becomes significant where valuable advice regarding rare diseases and surgical procedures can be obtained from experts from any part of the world.

Medical professionals use many digital devices for ease in the diagnosis and subsequently in the treatment of many diseases. One such example is the digital glucometer which can be used to screen diabetes. It is an easy, inexpensive and less time-consuming procedure and can also be used in cases of screening camps at the community level. Those screened with a higher blood sugar level can be subjected for more accurate investigations. Another example is the use of digital device for the measurement of blood pressure; many people use it to record their own blood pressure without requiring training or visiting a healthcare delivery unit for this. By the use of a traditional sphygmomanometer for recording the blood

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pressure as this gives a more appropriate reading. Another such example is improvised technology in laparoscopic surgeries where it is possible to visualize the ongoing procedure without causing much postoperative pain. This also reduces the chances of misconduct.

**Disaster preparedness**

The usefulness of digitalization can also be traced to the prior detection and reporting of natural calamities. With the use of specific technologies, it has become possible to know an upcoming natural calamity like an earthquake, cyclone, tornado or a tsunami. By prior notification many preventive measures can be planned with respect to disaster preparedness. Houses near a sea can be abandoned, food packets can be arranged, medical team can be constructed to reach the area of need whenever necessary. Temporary shelters can be built, the cattle can be shifted to safe places so that the diseases that may result from their death and decay can be prevented. Disaster preparedness can minimize the detrimental effects of the calamity. Similarly, prior notification of high tides or heavy rainfall renders help for the fishermen and they can be advised not to go to the sea during such unfavorable conditions.

**E-participation**

With the rampant use of computers, laptops and smartphones it has been increasingly easy for e-participation in many activities. By e-participation it has become quite easy to reach a large population for their views or suggestions regarding many matters of concern. Based on the rapid development of Web 2.0 technologies and associated social media, Internet users are now enabled to create content on their own. By using political blogs or discussion forums, people express their opinion, participate in discussions or find politically like-minded individuals. (5) E- participation can be considered while conducting multicentric studies by generating a e-participation form. In cases of employment, there can be use of digitalization where in e-engagement or work from home can be optional. This will, in turn, increase compliance of the employees. Along with so many positive aspects there are detrimental effects of internet addiction and digital devices also.

**Disadvantages**

Recent reports indicated that some on-line users were becoming addicted to the Internet in much the same way that others became addicted to drugs, alcohol, or gambling, which resulted in academic failure (6,7) reduced work performance (8) and even marital discord and separation (9). Clinical research on behavioral addictions has focused on compulsive gambling (10), overeating (11) and compulsive sexual behavior (12).

A study done by Piyush Upadhyay in Uttar Pradesh reports high level of anxiety and depression associated with internet addiction among adolescents (13), computer dependency (14), Internet use to the point of addiction, however, can have wide-ranging adverse consequences that affect many domains of the individual’s life: interpersonal, social, occupational, psychological and physical. Perhaps the greatest negative impact tends to be on family and social life, as excessive time spent online often results in neglect of family, social activities and interests. The term ‘cyberwidow’ has been used to refer to the neglected partners of internet addicts (15). Although the merits of the Internet make it an ideal research tool, students surf irrelevant web sites, engage in chat room gossip, converse with Internet penpals, and play interactive games at the cost of productive activity (16). Obsessive video game playing has also been reported to be associated with overuse of internet (17).

However, the concept of addictive Internet use has not been empirically researched. Therefore, the purpose of this exploratory study was to investigate if Internet usage could be considered addictive and to identify the extent of problems created by such misuse.[ Can be added if appropriate]The use of internet in smartphones, laptops and computers can be both beneficial as well as a threat to health depending on its duration of use and the posture during its use.

**Adverse effect**

Many studies have reported the adverse effects of smartphones, laptops and computers on eyes, musculoskeletal disorders, sleep disorders, behavioural changes, internet addiction, effect on brain, trouble in cognition, obesity etc. Other effects can be psychosocial stress due to maladjustment in relationships. An article in Psychology Today says that the use of technology can alter the actual wiring of the brain. More than a third of children under the age of two use mobile media. That number only increases as children age, with 95% of teens between 12-17 years of age spending time online. The time spent with technology doesn’t just give kids newfangled ways of doing things, it changes the way their brains works, depicts the article (18). [Psychology today] A study in Uttar Pradesh also depicts that smartphones affect mental health adversely (19). The following table depicts the various adverse effects of smartphones and internet use on its users as depicted by various studies.

Kimberly S. Young in his published article has depicted internet addiction as a new clinical disorder (23).

Video-game-playing and Internet use, like other behaviors underlying impulse control disorders, may be considered as lying along a continuous spectrum.

**Table 1** Adverse effects of smartphones on its users

Studies	Reported Adverse effect
Vidyachathoth <i>et al</i> in Mangalore (20)	Academic work, having physical and mental health problems, and having problems in their relationship.
Association between mobile phone use and inattention in 7102 Chinese adolescents: a population-based cross-sectional study (21)	Inattention in adolescents was significantly associated with mobile phone ownership, the time spent on entertainment on the mobile phone every day, the position of the mobile phone during the day and the mode of the mobile phone at night.
Vipula Mahindrakar <i>et al</i> (2)	Adversely affects the sleeping habits
Amir Seifi <i>et al</i> (22)	Using the Internet due to its false appeal to the people slowly makes them addicted to it and can provide them the emotional and psychological needs.

As such, there is not a uniform consensus about what level of behavioral engagement constitutes a problem or an addiction. Although there has been no widely agreed-upon threshold for defining videogame-playing or Internet use as an addiction, excessive engagement involving interference in major activities of daily life has been associated with clinical and biological correlates (24).

Other adverse effects that can result from excessive use of computers, laptops and mobile phones are musculoskeletal disorders mostly presenting with backache; fatigue, increased lacrimation and burning sensation in the eye, Visual defects including refractive errors.

### Prevention

These effects can be minimized by restricting the use of such gadgets only to a limit to which they are necessary. Overuse of smartphones and internet use should be avoided to enjoy their benefits and avoid their adverse effects on public health. For achieving this; legislative measures should be implemented to restrict their use according to its requirement in respective fields, eg. internet use in banks should be permitted to a higher limit than in schools and colleges. Other than this more studies should be taken up to explore other facts about the effect of digitalization on public health and health education camps should be arranged to deliver health education on the adverse effects and the precautions that can taken for improvement of health. Psychosocial aspect of health should be prioritized as digitalization should not be a reason for broken relationships.

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