Users perceptive of Technology based interventions to prevent obesity

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Word Count: 3500

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ABSTRACT

Obesity is acute and growing health problem and has become an epidemic issue across the world. Weight gain problem is affecting the adolescent's at large. Around 2.1 billion people are obese worldwide. Obesity is not only a disease but a plethora of other diseases. There are other diseases associated with obesity such as stress, chronic heart and kidney problems, diabetes, high blood pressure and high cholesterol. It also leads to social stigma, isolation, depression or other mental disorders. WHO has highlighted obesity as major cause of concern for population across the world. Due to reduction of physical activity and low intake of proper diet adolescents are at higher risk of becoming obese. Technology based interventions which include web-based learning, e-learning, active video games, nutrition sessions, health tips, not only help in educating the adolescent's and increase their knowledge base, but also helps in increasing the motivation factors towards physical activity and increasing the intake of sufficient quantity of fruits and vegetables. The present literature review focuses on user perspective towards technology based interventions in preventing obesity.

INTRODUCTION

BACKGROUND

Obesity is growing and acute as well as chronic health problem and is an epidemic issue worldwide. Overweight problem or obesity has affected almost every industrialized nation. Obesity or overweight is defined by WHO as accumulation of abnormal fat or excessive fat accumulation leading to health problems. Obesity cases have increased to double numbers worldwide since 1980. Most of people live in countries where obesity or being overweight kills more people than underweight population (WHO,2016). The disease is associated with poor eating habits along with limited physical exercise leading to serious health issues (Bazzano, 2006; Hallal et al., 2006). During the present study it was found that most of Americans have poor eating habits with limited intake of recommended diets including fruits and vegetables. This is a serious issue if taken into consideration of public health as a whole, as college students would join the adults in future carrying the burden of obesity along with them (Guenther, *et al.*,(2006) and Moore, et al. (2006)) The stats include major portion of college going students, who have been found of having poor diet habits. Another cause of concern is they have limited physical activity which worsens the condition of becoming obese and becoming obese adults with serious medical health issues (Kolodinsky *et al.* & Larson *et al.* (2007)). Recent report by American.Collg,Helth.Assoc. highlights that around 245 plus students going to college out of 3500 had regular intake of fruits & vegetables per day. Rest others were found to have very minimal intake of recommended fruits and vegetables (ACHA, 2006). Regular and vigorous physical activities and exercises declines when school students go to college. This is a serious finding. It's not only restricted to any particular geographical area, but is an issue prevalent worldwide (Nelson, Gortmaker, Subramanian, & Wechler, 2007). Individuals who are obese or

having overweight problems not only are affected with this disease but also get affected with other lifestyle disorders. These include chronic heart and kidney problems, stress, mental disorders such as depression, high blood pressure and high cholesterol levels, diabetes, etc (Kottwitz, 2014). The prevalence of adolescent obesity has quadrupled in past 30 years. The figures have increases from 5 % to 21 % (Ogden, Carroll, Kit, & Flegal, 2014).

TECHNOLOGY BASED INTERVENTIONS

To cater the seriousness of problem, technology based interventions have proven to be an effective and efficient medium in preventing the adolescents from becoming obese adults. Computers have revolutionized our generations and have worldwide penetration especially among the adolescent's populace. With the invention of internet and plethora of information available on it, it happens to be a dependable medium in interventions towards prevention of diseases. No doubt people especially adolescents are bound to sit for long hours due to habit of sitting in front of computers, but it can be used in educating the same people in terms of health information available via the same medium. Several platforms associated with computers and internet & are now available which can be highly helpful in dealing with the obesity crisis. Computer & internet technology have opportunity to turn the table and can help us in preventing our future generations becoming obese. Web-based tutorials, educational websites, e-learning platforms, active video games, mobile platforms, smartphone apps all are part of technology based interventions which can help us in our fight against obesity or over-weight. During the literature survey articles and web pages from google scholar, google search engine, pubmed, science direct, online journals provide enough justification for advantage of technology based interventions in preventing obesity or over weight conditions. Research works have been published where social media platforms, e-learning platforms, web-based tutorials, active vedio

games, mobile platforms, smartphones have tremendous impact on users perspective. As most of the world populations are glued to the latest gadgets, the experience of health tips and awareness programs can have tremendous impact. This can be used to sensitize the adolescents and can help in increasing their knowledge base regarding healthy living and maintaining healthy lifestyle. Motivation factor towards healthy eating habits can be carried out using these technologies and can help in preventing the goal of making people healthy and fit for life.

Web-based tutorials and e-learning platforms can have self-motivation behavioral changes in the user and can teach self-management techniques to cater to the problem of obesity. During literature survey it was found that the user gets aligned to health based knowledge platforms and inculcates the habits in their lifestyle. Such web and e-learning supported by expert network can improve the treatment of millions of people. Technology based interventions (TBI) are cost effective with increasing affordability for newer technologies. The TBI can help in educating the masses and bring out a transition of more educated and knowledgeable population.

Technology based interventions includes everything that technology covers like websites, mobile platforms can be highly successful. Reason being they provide personalized and user focused interface. This means the self-guided tutorials can reach higher degree of population and that too by providing personalized and customized experience. This will impact the health standards of millions of people at one go.

Technology based interventions which include web-based learning, e-learning, active video games, nutrition sessions, health tips, not only help in educating the adolescent’s and increase their knowledge base, but also helps in increasing the motivation factors towards physical activity and increasing the intake of sufficient quantity of fruits and vegetables. It has been found

that with increase in penetration of technology devices user behavior can be changed with highly successful results. Increase in physical activity and focus towards healthy diet which includes eating recommended fruits & vegetables can be influenced through the use of mobile technologies.

MOBILE TECHNOLOGIES

Mobile technologies can help in disease management and help in improving the health condition. Mobile technologies (MT) include handheld and ultra-portable computers such as tablet PCs, hand-held video-game devices, PDAs phones, smartphones, mobile phones; PMP's, EDAs, , Smartbooks such as kindle.

These devices have plenty of inbuilt technologies which include text messaging, w.w.w. access, M-M playback and other software applications. Use of these features in educating the masses towards quality healthcare can be highly beneficial. Mobile technologies are popular due to ease of their use, varied functionality and technology capabilities. The present study under literature review highlights the use of such technologies in prevention interventions.

More than 2/3rd of population across world cherishes having mobile devices, which may be mobile phones, smartphones, and portable devices etc, as per 2009 data. Approx.4.0 trillion messages were sent and received. Mobile technologies have high rate of penetration with most of the high industrialized nations having greater number of mobile platforms as compared to population.

Mobile technologies have attention grabbing interface and is highly relevant when it comes to educate the masses. Using text messages people can motivate others towards healthy living. Governments and healthcare providers can use these mediums to run health campaigns and can

help in sensitizing the population at large pace and in greater quantity. Mobile technologies provide low cost interventions, thus makes the goal of healthcare providers easier. Popularity of mobile devices and technologies are increasing at greater pace. They have in present scenario huge penetration rate. With greater penetration of these devices people can seek help from others at greater pace and at low cost. Mobile technologies are boon for public, as they can use and send motivational messages, several tools are available which impact behavior, monitoring tools are available, all of which can be tapped appropriately and hence potrays huge opportunities for healthcare practitioners and government body. A mobile health intervention (MHI) focuses on the application of very special devices. Mobile technologies or technology based interventions help in crossing the limits of old conventional methods of educating and monitoring people towards better healthy lives. Special smartphone apps have been designed and are already available in the market with free access. These are the means through which mobile technologies can be highly helpful in fighting the increasing numbers of obesity cases worldwide (Free, 2013).

PREVELANCE OF TECHNOLOGY AMONG ADOLESCENTS

The technology has become a viable means of meeting and distributing nourishment and physical activity education. Nowadays, college pupils are the most technology bound groups in any nation, partaking high degree of computer usage (Ahern, 2007)..

Almost 93% of adolescents in the USA have access to a computer, 78% have cell phones of which 47% have smartphones, and 23% have a tablet computer. Adolescents being high grade users of these technologies offer huge opportunities to the healthcare providers in providing quality health education. Media channels, you-tube videos, video games have huge impact on these generations. Plenty of opportunities lies which can be tapped in efficient manner to deal

with adolescent obesity. Some technologies which are available for the benefit of people in dealing with obesity crisis have been mentioned ahead. The basic advantage of these technologies is that adolscents have huge behavioral associated attachment with them. Using mobile interface and other portable technologies in changing a behavior towards healthy living can be highly achievable aspect. This is the opportunity which requires to be tapped effectively as well as efficiently.

NEWER TECHNOLOGIES

There exist a new wrist-worn physical activity measurement monitor which can aid in prevention and management of lifestyle diseases such as obesity. Awareness drive on mobile platforms can be conducted so that people could access new devices which are helpful in building healthy lifestyle.

(Carter, 2017) in his paper discusses about the market of newer devices available for public use. Accelerometers to estimate energy expenditure are available in markets. Recently, technology has advanced, enabling inclusion of a (PPG) sensor in such devices to measure obesity related heart diseases such as measuring heart rate. The data from this sensor can enable more accurate estimations of energy expenditure.

SMART technologies are available which can help in boosting self-monitoring habits among the people. Such devices impact the behavior of people making them health conscious and thus preventing the occurrence of major life threatening diseases which in our cases is obesity among others.

METHOD SELECTION

For the purpose of study keyword search such as mobile technology intervention in treating diseases, novel technological interventions in treating obesity, users perspective in technological intervention towards prevention of obesity was carried out. The search results were carried out in google search engine, EMBASE, PUBMED, SCIENCE DIRECT.

Almost 59 search results were studied having papers from varied journals and websites. It was found during literature survey that most of the research results find technology based interventions efficient and effective towards minimizing the risk of obesity and increasing the motivation towards physical activity and intake of fruits and vegetables or in other sense intake of balanced diet. It was found that web-based tutorials and e-learning platforms really result in changing of attitude of adolescents and help in fighting obesity through self-motivation platform. Internet is highly useful tool and using it effectively to fight obesity leads to tremendous better results as it was compared to past. Users are aligned to internet more these days and are motivated to videos and sessions exposed through their internet experience. The literature review completely emphasizes the research to be carried out in the present area to bring more clarity in understanding the perspective of users towards technology based interventions in reducing and preventing obesity.

RESEARCH METHODOLOGY

A Qualitative Research Methodology was carried out. Literature review from journals and research articles were included in the present study. Obesity is major cause of concern for adolescents. Using technology based intervention in preventing obesity is highly practical keeping in view as large numbers of adolescents are using certain kind of technology interface.

Thus penetration of health information through web-based tutorials, e-learning, active vedio games is huge. This will have huge impact on behavioral changes and bring a habit of quality life among the adolescents.

INCLUSION & EXCLUSION CRITERIA

INCLUSION

- For the purpose of study Adolescent population was selected with in the age bracket of 12 to 19. Reason being the adolescents will become adults in future and obese adults are major health issue. If the problem is addressed earlier, the future generations can be controlled from becoming obese adults.
- Latest research papers were included for the study with in the past ten years with current year as latest criteria.
- Technology based intervention included in this study are Mobile technologies, web-based tutorials, e-learning platforms, active-video games. Obesity related studies were included for the present study.

EXCLUSION

- Children and adult obesity studies were excluded from the present study.
- Older research papers more than ten years old were excluded from the study.
- Diseases other than obesity were excluded from the present study.

LITERATURE REVIEW

(Chen, 2014) in his review article studied about the efficacy of T-B-I in preventing obesity among adolescents. In his paper the author emphasized on advantages of T-B-I in preventing obesity as most of the adolescents are technology savvy and have access to one or other technology gadgets. The age groups of 12 to 19 are high users of mobile gadgets and computers. Including health related topics through web-based tutorials, e-learning, and active video games will have high grade of attraction for them. It will help them in changing their habits through increased knowledge base regarding healthy habits. For the purpose of study, the author included studies between years 1990 to 2014. In his result the author found that almost 42.8 % studies found that technology based intervention lead to significant decrease in body mass index (BMI), a marker to study obesity as defined by WHO. In his study, (Chen, 2014) found that 4 Intnt. based interventions lead to significant decrease in BMI and percentage fat reduction. Plus two active video games interventions lead to significant decrease in adolescent obesity. Six out of eleven studies found improvement in physical activity outcomes among the internet based and video game based technology interventions. Even the results emphasized reduction in sedentary lifestyle among adolescents with the use of technology based interventions. 5 of the 7 studies recommended enhancement in psychosocial role in adolescents using the technology-based – interventions (T-B-I). However, the literature currently available is insufficient to examine the impact of technology-based obesity prevention interventions.

(Lucas, 2015) mentioned in his paper published in Elsevier the importance of eHealth initiative in controlling the obesity among adolescents. eHealth initiative helps in building self-monitoring practices and self-motivation practices among the poor population. The author suggests eHealth

which is a kind of technology based intervention effective in dealing with obesity crisis or other chronic health related issues.

(Free, et al., 2013) studied the effectiveness of mobile technologies in intervention of disease management. He found sufficient data which emphasizes that mobile technologies can help in proper disease management and lead to better obesity management as an understanding.

(Franko, et al., 2008) studied the efficacy of Internet based education program in building motivation factors towards physical activity, and towards healthy nutrition intake habits. In his study he examined the effectiveness of internet based learning platform named, Mystudentbody.com. He found it is highly effective medium in providing nutrition knowledge and enhanced the behavioral changes among the adolescents or college going students.

(Singh, et al., 2016) studied the mobile apps significance in educating masses towards healthy lifestyle. Though the results showed limitations in mobile apps reach due to technological reasons, the author explained the efficacy of mobile apps in preventing major diseases including obesity. Hence, since adolescents are highly accustomed to mobile apps and its usage. A app for health tips would be beneficial in building motivation towards physical activity as well as intake of recommended fruits and vegetables.

(Hendrikx, et al., 2017) studied a comparative study of Philips health watch among the 29 participants. The health watch helped in studying total energy expenditure estimation. It was found within the 15 % of predefined equivalence margin in reference to portable indirect calorimeter. The health watch can provide valuable data in terms of total energy spent. Thus it's a self-monitoring device which can give inputs to the user regarding the outcome of his physical

activity. This is highly valuable in controlling obesity. Noting down total energy spent after vigorous physical activity can help in managing the obesity effectively. Thus, it's one of the advantages of technology-based interventions in preventing obesity.

(Carter, et al., 2017) studied the application of mobile apps in changing the behavioral attitude towards weight loss. He found significant results which showed that mobile apps really resulted in subsequent weight loss.

(Malley, et al., 2014) studied the efficacy of mobile app in adolescent obesity management. His research found that the adolscents found the app very useful and user friendly. The app scored above the satisfaction criteria and this gives us a input that such technology based interventions are highly popular, practical and useful in dealing with obesity crisis among the adolescents which is present cause of concern.

(Karppinen, et al., 2016) studied the change in health behaviors of users using web based e-learning platforms. The author studied web based information system in changing the behavior of user. Two frameworks were used to measure the outcomes, which were, Persuasive system design and behavior change support system. It was found during the study the persuasive based softwares have huge impact in changing user behavior and thus this technology can be used in interventions related to prevention of obesity.

RESULTS

During the extensive nine literature review it was found that technology based intervention towards obesity prevention is a novel area which requires a solid research. The literature review doesn't prove direct relationship between obesity prevention and technology based intervention. However, this is a grey area which the literature review supports to be studied further.

TIMESCALE AND RESOURCES REQUIRED

A full academic year is required to study the research work effectively. The research work also needs participants who can carry out a qualitative study of adolescents in the given area. Volunteers are required to complete the study along with access to technologies included in the study.

PUBLICATION

The research work upon completion shall be published in Adolescent Health, Medicine and Therapeutics (A.H.M.T.) Journal. A.H.M.T. in Dovepress journal would be appropriate to publish the present work. The journal is highly applicable for the present study as it has broad areas of criteria for a paper to be published and mainly deals with health related interventions.

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