Researchers across the world have tried to study various aspects related to Internet use, be it the overuse of the Internet or how and in what ways it affects people's lives. In a 2003 review of existing research on youth Internet use, Livingstone (2003) argued that research on children and the Internet must go beyond access to examine the nature of Internet use—its nature and quality, social conditions, cultural practices and personal meanings. In particular, she noted that research that combines qualitative and quantitative data is deeply needed, but rarely published.

The present research aims to fill this need by studying the prevalence and nature of Internet use in a school-based sample of adolescents. The study also investigates various psychosocial correlates of Internet use among adolescents. For this purpose 10 schools were selected across Vadodara district (Gujarat, India) as the sample for the data collection. Questionnaires were administered to 1657 school going adolescents across the 10 selected schools to study the prevalence and nature of Internet use. The present chapter is divided into three sections. Section 1 discusses the prevalence of Internet use; Section 2 discusses the nature of Internet use; and Section 3 discusses the various psychosocial correlates of the Internet use.

4.1 Section 1: Prevalence of Internet Use

4.1.1 Prevalence of Internet use among adolescents

Based on the Young's Internet Addiction Test (IAT) criteria, the results of the present study show that a majority of the participants were Below Average Users (BAUs) and Average Users (AUs) of the Internet. However, around 15% of the participants were Above Average Users (AAUs) and 0.5% of the total participants were Significantly Above Average Users (SAAUs) of the Internet.

Various studies done across India show that the prevalence rate of average users of the Internet was in the range of 34% to 74.5% and that of high Internet users was in the range of 0.3% to as high as 18% (Nalwa & Anand, 2003; Goel et al., 2013; Chathoth et al., 2013; Sharma et al., 2014; Krishnamurthy & Chetlapalli, 2015). The results of the present study fall in the range found by other researches across India. However, it was observed that there were variations in terms of the categorization of Internet use in various studies done on the prevalence of Internet use. These variations were mostly because of the tools used by the researchers. Differences in the results were also found due to the sample sizes by various researchers, the age groups of the samples and the areas from where the data was collected.

4.1.2 Prevalence and differences in Internet use among male and female adolescents

It was hypothesized that there will be significant difference in Internet use by male and female adolescents.

The results of the present study confirmed the conjectured hypothesis. The results indicate that higher a number of females were Below Average Users as compared to males. The results also indicate that more males belonged to AU, AAU and the SAAU categories as compared to their female counterparts. These findings corroborate previous studies which state that high use of Internet/ Internet Addiction is more common in males than in females (Griffiths, 1998; Chou & Hsiao, 2000; Anderson, 2001; Niemz, Griffiths & Banyard, 2005; Krishnamurthy & Chetlapalli, 2015).

Cone (2001) discusses various reasons why a gender gap exists in the use of computer technology; these issues may also relate to Internet use. For example, he suggests that schools and society encourage boys to use computers more than the girls, contributing to the latter's lack of confidence and lower usage of this technology. Boys are exposed and encouraged to play games which require energy, aggression and competition at a very young age. Video

games also involve fighting, violence, overpowering, etc., which are more appealing to males than to females. On the other hand, from a very young age girls are, taught to behave nicely and be friendly with all, follow what the elders tell them and to be compromising. These values may discourage females from playing violent video games. Therefore, girls might become disinterested in computers at an early age contributing to a gender gap in their use of this technology.

The discrepancy between male and female Internet use can also be explained in terms of other addictive substances which are more commonly used by males (Fielding, 1998). A meta-analysis of Internet addiction (Douglas et al., 2008) notes that people with a history of addictive behaviour are at a higher risk for the development of getting Internet addiction. All these factors explain the elevated rate of Internet addiction in males.

Educational statistics in India also show disparities in school enrolment rates between girls and boys that sharpen in the higher stages of education. Key indicators such as literacy, enrolment and years spent in school explain access to education and each of these indicators reveals that the level of female education in India is still low and lagging far behind, thus also contributing to gender gap in Internet use.

4.1.3 Prevalence and differences in Internet use among different grades

It was hypothesized that there will be significant differences in Internet use by adolescents across different grades, with Grade 9 users being the least and Grade 12 users being the highest users of Internet.

The results of the present study did not confirm the presumed hypothesis. The results indicated no significant differences in the prevalence and use of Internet among all the four grades. The results also indicate that the use of Internet was almost at par for all the four grades. Contrary to the results of the present study, Muthuthandavan and Christadoss (2014),

found a higher incidence of Internet use among Grades 10 and 12 as compared to Grades 8 and 9. Yang and Tung (2007) studied high school students and noted that although the prevalence of Internet addiction dropped with grade, this was not statistically significant. A number of studies across the world have studied the correlation between age and Internet addiction with varied results. For example, Karacic and Oreskovic (2017) found that the level of Internet addiction was highest in the 15-16 year old age subgroup, and was lowest in the 11-12 year old age subgroup. There was a weak but positive correlation between Internet and the age sub group (P=.004). Johansson and Götestam (2004) studied Norwegian high school students and found no relationship between age and Internet addiction.

During the course of data collection it was observed that in rural areas, there was a wide range of age differences seen in the same grade. For instance, it was seen that a 14 year old and a 17 year old were in the same grade. Therefore, in the present study grades and not age were taken into consideration.

A possible explanation for equal amount of Internet use among all the four grades may be because adolescents begin their search for future careers. Deciding what they want to do in future decides which stream they want to take up in their 11^{th} and 12^{th} grades. Also, these four years have various educational pre-requisites for qualifying for their board exams. For example, students may have to do some project work or social work before appearing for their board exams in grades 10 and 12, which may require the use of Internet equally among all the four grades. Also, there could be more Internet use among these students possibly because at this age they have achieved a greater level of independence and their free time and social activities are less controlled by their parents.

4.1.4 Prevalence and differences in Internet use among English and Gujarati medium participants

It was hypothesized that there will be significant difference in Internet use among English and Gujarati medium participants.

The results of the present study confirm the above hypothesis. The results indicate that there were more number of Gujarati medium participants who belonged to the below average users' category, while English medium participants were more in the other three categories. However, the use of the Internet by Gujarati medium participants was higher than the English medium participants in the BAUs, AUs and AAUs categories. This implies that though there were more number of English medium participants using the Internet, their daily life was less affected by the use of the Internet than the Gujarati medium participants.

Due to lack of research on Internet use among English and other vernacular languages in India, this aspect of the present study warrants further research.

4.1.5 Prevalence and differences in Internet use among Urban and Rural participants

It was hypothesized that there will be significant differences in Internet use by adolescents residing in urban and rural areas.

The results of the present study confirm the conjectured hypothesis. Urban and rural participants differed significantly in terms of Internet use. It was seen that rural participants were more Below Average Users (BAUs), while participants in urban areas were more Average, Above Average and Significantly Above Average users of the Internet. These results are supported by Vaidya, Jaiganesh and Krishnan (2015), who found 86% of the urban participants in Pondicherry addicted to the Internet as compared to only 14% of rural participants. Similarly, Li et al., (2014) found that prevalence of Internet use among Chinese

elementary and middle school urban students (81.8%) was higher than it was among rural students (48.5%).

Bell, Reddy and Raine (2004) suggest that living in a rural area in itself has little or no influence on whether one goes online. However, low-income people in rural areas are less likely to be online than low-income people living in urban or suburban areas. Middle and upper income people in both rural and other areas are equally likely to be Internet users. At the same time, some of the gap between rural and urban areas can be explained by other demographic realities such as the fact that rural residents as a group are less wealthy and have lower levels of educational attainment as compared to those living in urban areas.

Another probable reason for the high use of Internet in the urban population is the availability of new and advanced technologies that offers more and easy access to the urban adolescent population as compared to their rural counterparts. Mobile networks have better speed and connectivity in urban areas and most of the people have 3G or 4G networks on their mobiles which give them quick access to anything and everything. With latest technology taking its time to reach the rural parts, the rural adolescent population may lag behind when it comes to using the Internet. In addition to this, it is seen that in rural areas there is usually a single Internet Service Provider and hence users have a limited choice for accessing the Internet. They do not have facilities which give them an opportunity to learn new and advanced things on the Internet. Also true is the fact that not all children in rural areas have access to computers/laptops at home and the only way to access the Internet is through mobile phones. All these factors may lead to less Internet use among rural participants.

4.2 Section 2: Nature of Internet Use

4.2.1 Years of using Internet

The results of the present study found that participants who had more experience of Internet use (more than 5 years) were more likely to be classified as AAUs and SAAUs of the Internet or as Internet addicts than those with less experience. These results are supported by similar studies done in Punjab (Kumar & Kaur, 2005), and Andhra Pradesh (Srijampana, Endreddy, Prabhat & Rajana, 2014), where it was found that 30.7% of the participants had been using the Internet for 2-4 years, 24% of them had been using it for more than 4 years, and 13.3% had been exposed to it for more than 5 years.

However, this finding contradicts Young (1996) who found that new Internet users (using the Internet for less than six months) were more prone to be Internet addicts than experienced users.

Since few researches exist which examine the relationship between the experience of using the Internet and Internet addiction, this aspect requires further research.

4.2.2 Days and hours of Internet use

The amount of time spent on the Internet has been reported to be one of the influencing factors for Internet addiction. In the present study it was observed that a majority of the AAUs and the SAAUs went online daily and most of them spent 4 or more hours surfing the net during holidays. The results of the present study also reveal that those belonging to the SAAUs category spent more than 4 hours even during their regular school days. Several studies have reported that Internet addicts tend to spend at least twice the amount of time online as non-addicts and on an average they spent 20-39 hours per week as compared to 5-9 hours spent by non addicts (Young, 1996, 1998; Chou & Hsiao, 2000). A few Indian studies

have also reported that around 5.5% to 14% of the high users spent more than 5 hours daily using the Internet (Kanaujia & Satyanarayana, 2003; Nalwa & Anand, 2003; Thanuskodi, 2013; Kumar & Kaur, 2005). Prevalence rates of high users who have been surfing the net for around 2-4 hours daily, have been reported to be around 23% to 50%.

There may be various reasons for adolescents spending more time on the Internet than on other activities. For example, when an adolescent tries to research for a particular topic, he/she may be provided with tremendous pool of information. Browsing from one page to another and then another, leads an adolescent to get carried away, sometimes forgetting what he actually was surfing. Also, the vastness of the information on the net sometimes confuses the adolescent as to what information to retain and what to let go. All this may lead him to spend more number of hours on the Internet, forgetting about other activities or household chores they may be required to complete. Also, social networking sites play a major role in individual's confidence, social anxiety and loneliness, etc. which may impact the number of hours adolescents spend in using the Internet (as discussed in Section 4.3). Adolescents who end up spending more number of hours on the Internet have been reported to have incomplete homework or finishing household chores, since the Internet seems to be more exciting than these activities.

The present study also found differences in the amount of time spent on the Internet during a regular day vis-a-vis a holiday/weekend. The results show that above average users spent almost 3-4 times more time online during a weekend/holiday as compared to on a regular school day. These results are supported by a Turkish research which found that participants used the Internet for an average of 2.5 hours daily during vacations; the time spent online was less during the regular school session (Vaizoglu et al., 2004). With education system being demanding and competitive, adolescents hardly have any time during the week to sit at the computer for long hours as compared to on weekends. It has also been observed that parents

enroll their children in various co-curricular activities throughout the week which do not permit them to use the Internet for longer durations during week days.

However, it is observed in previous literature that most studies only examined the total amount (per week) of time that adolescents spent online. Thus, further research is needed to validate these findings and to explicate the potential influence that the time of day and day per week may have on Internet Addiction.

4.2.3 Social Networking Sites (SNS) and time spent on SNS'

The Internet and Social Networking Sites (SNS) have become an integral component of many adolescents' development and life these days. There are a vast number of SNS' available for individuals to choose from with multiple factors influencing the decision to use a particular SNS. In the present study, Twitter was the most used social networking site among the adolescents followed by Facebook and other SNS such as WhatsApp, Hike and WeChat. More than half the AUs accessed these sites while around a quarter of the AAUs used Facebook daily.

There are various reasons as to why adolescents use social networking sites. One of the most common reasons is the 'fear of missing out' - "FOMO", which is very high in adolescents. The need to be in constant touch and not missing out on anything is so intense in these adolescents that they are compelled to check their Facebook and Twitter accounts very often. Another reason for adolescents using SNS is for developing their own self identity. Since adolescents are constantly worried during this phase of their lives as to who they are, the need to develop an identity is quite strong. The Internet and social networking sites provide them with a space where they can explore their identities by making blogs or profiles.
Also the fact that adolescents at this stage are experimenting with new relationships, they look for comrades or a group of friends in which they can feel a sense of belonging. The

Internet and SNS in particular, serve the dual purpose of anonymity and the need for belongingness. The Internet helps them create perfect identities/profiles, which may be fake, and help them share only those things which they feel would be accepted by others.
Social Networking Sites have captured young minds by giving them opportunities not only to interact with other people but also to play games, buy products and follow their media and sports idols as well. SNS is a medium where social awkwardness can be readily avoided and immediate feedback on personal information is available throughout the day. Indian teens are specifically getting attracted to this digitalization of social networking as it gives them an opportunity to exercise freedom of expression.

The results of the present study also show that males use SNS more than females. Males are twice as likely to use Facebook and Twitter as compared to females. Similar findings were made by Manjunatha (2013) as 71% of males in her study used SNS, while only 29% of the females used SNS. However, not much difference was seen among the two groups in terms of using other SNS such as WhatsApp, Hike and WeChat.

The results of the present study also show that nearly a quarter of the AAUs spent 1-2 hours daily visiting SNS' during a regular school day. The present study also found differences in the amount of time spent on SNS' during a weekend/ holiday and on a regular school day. It was observed that higher users of Internet spent more time on SNS' during the weekend for a longer period of time as compared to on a regular school day.

A probable cause for such differences in the amount of time spent on SNS' may be due to the fact that school curriculums are demanding and hence it may be difficult for a child to get some time to himself or herself, let alone doing any social networking. The child is busy throughout the day either completing his homework, or attending some co-curricular activities important for his academic achievements. Hence, it seems easier for a child to finish

off all his work either on a Friday or Saturday morning so that he can spend the rest of the weekend, either playing online games or engaging in social networking. However, it is observed that most studies have only focused on the total amount of time spent on SNS, and not on the particular day of time or the day of week when the use of SNS' is high or low among users. Therefore, further research is required to corroborate these findings and to explain the potential influence that the time of day or a particular day in a week may have on children using SNS.

4.2.4 Mode and Place of using the Internet

The results of the present study indicate that the most commonly used gadgets to access the Internet were mobile phones, iPads and Tablets. Aided by the convenience and constant accessibility provided by cell phones, especially smartphones, more teenagers are able to go online throughout the day. Moreover, greater affordability, especially with the launch of Reliance Jio in late 2016 mobile penetration has increased. Now affordable handsets are available with free mobile data for the lower income group as well. According to an Indian study, at an average, an individual checks his phone every 6.30 minutes in the 16 hours that he is awake (Khosla, 2013). Since there is the need to be constantly in touch with friends and to be able to communicate with them, mobile phones are a handy device for adolescents. They can send texts, photos or videos to anyone at any time of the day, without waiting to go online through a desktop or a laptop. Teenagers are also able to call up their friends more often and talk to them whenever they want.

According to the report titled 'Mobile Internet in India, published by the Internet and Mobile Association of India (IaMAI), there were around 389 million mobile Internet users in India as on December 2016 (Agarwal, 2017). Additionally the report said that "Urban India, with 51% penetration is fast reaching saturation point while rural India with 16% is the future market of

growth. While urban India grew at 9%, growth in rural India was almost three times more at 26%".

With regard to the location of Internet use, the results of the present study show that more than three quarters of the participants used the Internet at home. A few Indian studies have found that around 2.9% to as many as 16.2% of the participants used the Internet at home (Thanuskodi, 2013; Kumar & Kaur, 2005). Most of the studies done worldwide too have found that a larger percentage of middle school students chose to access the web at home or at another person's home (Gencer & Koc, 2012; Wang et al., 2012; Li et al., 2014; Muthuthandavan & Christadoss, 2014).

Apart from using the Internet at home and through mobile devices, participants tended to use Internet at various other places as well, for instance, in schools, friend's home, library and at relatives' place. A few Indian studies have found similar results where most of the participants used the Internet at places like schools, friend's place, library, cyber cafes. (Kumar & Kaur, 2005; Muthuthandavan & Christadoss 2014). Since a majority of the schools these days have computers and Internet access, students may sometimes be allowed to use the Internet in schools. It was observed that some of the schools did allow students of higher grades, i.e., 11^{th} and 12^{th} to access Internet in their computer labs or in the library for their project work. But with limited access to Internet in schools, these children were unable to surf social networking sites. Using computers at home is mainly for chatting and using SNS or for playing and downloading games, movies, etc.

4.2.5 Purpose of Internet use

The results of the present study show that the most common uses of the Internet among adolescents were playing interactive games, e-mails, chatting, social networking, Instant Messaging (IM), downloading movies and games, watching videos, online shopping,

watching news, doing homework/research, and gambling. Several studies across the world suggest that adolescents use the Internet for various purposes. For example, the most common uses of the Internet are studying/homework (73%), e-mails (59%), playing games (38%), chat sites (32%) and hobbies and interests (31%) (Valkenburg & Soeters, 2001), while a few used it for shopping as well (Nie & Erbring, 2000).

In the present study significant gender differences were observed between males and females in their use of Internet for various such purposes. For example, males were more likely than females to use social networking sites or playing single player games, while not much difference was seen in their use of the Internet for fulfilling their hobbies. Overall, it was observed that males were higher users of the Internet as compared to their female counterparts. These findings are supported by previous studies which show that men are more likely to use the Internet for many other purposes such as research and engage in online shopping (LaFerle et al., 2000; Odell et al., 2000; Weiser, 2000). For example, some authors have indicated that males may be more likely to play or download games (LaFarle et al., 2000; Odell et, al., 2000; Weiser, 2000; Nachimias et al., 2001), listen to or copy music (Odell et, al., 2000) and also use the Internet to find out about their subject of interest, (LaFarle et, al., 2000; Mandell & Muncer, 2004). The findings of the present study corroborate that males are more active as compared to females when it comes to downloading games and movies.

It is also seen that males are given more advantage/ preference over females in using the various resources available to them, including computers or laptops. However, even today in some segments of the society, especially rural areas of India, boys are encouraged to exhibit and develop themes of power, competition and violence at an early stage in their lives. While girls may be allowed to study till graduation, they are yet expected to remain home and do household chores. Also, their time of using the Internet gets restricted due to other household

responsibilities. Playing games and using computers or Internet is mainly considered as masculine activities in these rural areas. Thus, though girls may sometimes use the Internet, it would probably be for research or homework purposes and not more, while boys may use it for playing or downloading as well.

Differences in the purpose of Internet use were studied by Vyjayanthi, Makharam, Afraz and Gajrekar (2014) and their results indicate that females outnumbered males in social networking, while males outnumbered females in multi load games. Males were also dominant in playing online games, accessing news groups, participating in discussion forums and jumping social networking sites whereas females had less online social relations and mostly communicated with their family and friends (Goodson, McCormick, & Evans, 2001).

Differences were also observed in the purpose of Internet use by English and Gujarati medium participants and by urban and rural participants. For example, English medium participants used the Internet more than their Gujarati medium participants for socializing, playing, recreational activities and downloading. Similarly, participants in the urban areas were higher users of the Internet for such purposes than their rural counterparts.

The reasons for such a discrepancy may be attributed to the fact that Internet availability is more in urban areas and the fact that English medium participants are more aware and exposed to the Internet as compared to their rural and Gujarati medium counterparts.

4.2.6 Various other aspects of the Nature of Internet use

In the present study participants reported using Internet excessively to the extent of neglecting other activities. The results also indicate that a little more than half of the participants in the AU and AAU categories tried to reduce the number of hours that they spent online. In a 2016 study by the Service for Healthy Use of Technology (SHUT) clinic at

Nimhans, 42% of the respondents reported that they postponed their work just to be online (Shrivastava, Sharma & Marimuthut, 2016). Macarie, Ştefănescu, Tebeanu and Chele (2012) report that 30.2% of their participants used the Internet excessively to the extent of neglecting other activities.

The Internet offers an enormous range of activities for all age groups. With Internet being available at our fingertips 24X7, it is very convenient to spend more time on the net. Students can watch their favourite football match or can use the Internet for studies. With sites like Netflix and Amazon Prime offering on demand entertainment, youngsters and adolescents are hooked to their computers and laptops, forgetting or neglecting other important activities. The world of the Internet is so exciting that once a person "logs- on", he forgets everything. According to Reed Hastings, co-founder and CEO of video streaming giant Netflix, Indians are the fastest in the world at binge watching, lapping up Netflix series such as Narcos, Bloodline and Marvel's Jessica Jones in just three days. (Sarkar, 2017).

The online environment offers a multitude of experiences from a psychological perspective, each with compelling features that may lead to problem behaviour (Wallace, 2001). For instance, extroverts might find themselves spending much more time on Facebook, compulsively checking it every 15 minutes to see how many 'likes' their latest post has earned. The fear of missing out—'FOMO'—can be a primary reason why some students check their social media hundreds of times, both day and night. Frequent Facebook use tends to reduce feelings of well-being in adolescents, rather than making them feel more connected and less socially anxious (Kross et al., 2013).

The results of the present study show that most of the participants in the AAU and the SAAU categories had visited websites where people discuss hurting themselves and had been to sites where ways of committing suicide are discussed. Also, a majority of these participants had

visited sites where hate messages are exchanged with a particular group or individuals. The results also indicate that most of the average users too visited sites where hate messages targeted at a particular group were exchanged. Previous literature on high Internet use has found a positive association between Internet use and suicidal ideation/attempt. The reason for such acts may be that since adolescents are constantly on the Internet, they may be victims of cyber-bullying. Children with low self esteem or low self confidence may not be able to take the hate comments that they receive from their peers. Other factors like isolation, loneliness and perceived lack of social support may make an adolescent more vulnerable to log on to the Internet and visit sites where ways of hurting themselves or committing suicides are discussed. These observations are of concern since around 50% of the students are engaging in self harming behavior and sending hate messages to others. Parents, teachers and counselors need to be equipped about this kind of nature of behavior of Internet use.

Adolescence is a critical period characterized by risk taking behaviours and increased levels of confusion and frustration. High use of Internet may lead to adverse effects on the psychological development of adolescents which may result in loneliness, depression or suicidal ideation. While online interactions provide essential social support for otherwise isolated adolescents who lack assertiveness, they may also normalize or encourage self harming and suicidal behaviour among those with these kinds of behaviours (Whitlock, Powers & Eckenrode, 2006).

It was also observed in the present research that while most of the participants did not avoid negative feelings like boredom and frustration by playing computer games, there were a few who sought computer games to avoid such negative feelings.

One possible explanation for this may be that adolescents learn the nature of avoidance with particular attention to adverse circumstances and negative feelings (McCauley, Gudmundsen,

Dimidjian & Martell, 2016). When adolescents are feeling sad or depressed, engaging in activities that minimize these feelings or allow one to get distracted from these negative feelings (e.g. spending hours playing computer games or watching TV) is a logical way of dealing with these negative feelings. Unfortunately, adolescents do not understand that this avoidance keeps them stuck in a depressive spiral. One may temporarily escape from or avoid these feelings, but in the long run, they could get addicted to such activities.

Research on Internet gaming has identified certain risk factors which may be associated with Internet gaming. These include certain personality traits, gaming motivations and structural game characteristics. According to some researchers, the personality traits most commonly associated with Internet gaming and addiction include neuroticism (Peters & Malesky, 2008; Mehroof & Griffiths 2010), aggression and hostility (Chiu, Lee & Huang, 2004; Kim, Namkoong, Ku & Kim, 2008; Caplan, Williams & Yee, 2009; Mehroof & Griffiths, 2010), and sensation seeking (Chiu, Lee & Huang, 2004; Mehroof & Griffiths, 2010). However, more research is needed to check whether a particular type of personality is likely to be associated with development of Internet Addiction.

On questions regarding satisfaction with life on various aspects, it was observed that a majority of the participants belonging to all the four categories were satisfied with respect to their school achievements, friends, life in general and the hobbies that they pursued. However, a few participants belonging in all the categories were dissatisfied with these aspects of their lives. There may be various reasons for their dissatisfaction. For example, it was seen that a majority of the SAAUs were dissatisfied with their school achievements and their friends. Dissatisfaction with friends may be due to factors like loneliness, social anxiety and cyber-bullying which may compel one to seek the Internet to overcome these feelings. Spending too much time on the Internet may also lead to poor results in school achievements and lack of real friendships.

The results of the present study also show that most of the participants felt that the Internet was useful to them in various aspects of their lives, for instance, in doing their homework, being in touch with their friends, learning new skill and not feeling lonely. As with all other forms of technology, Internet too has its advantages. Lei and Wu (2007) suggest that Internet use by adolescents continues to grow as adolescents are intensely interested in forming new relationships online, gaining access to information and engaging in online activities. They further mention that the expansiveness of the Internet provides an environment in which adolescents are freed from many constraints that they may encounter in the society. In a recent research it was reported that messaging sites like WhatsApp helps teenagers communicate better and to express themselves with their peers than in classrooms (Kizel, 2017). According to this research, group chats are based on trust among the members of the group and this enhances the possibility to be in contact. Further, discussions on WhatsApp groups enable the development of social environment that is warm and human.

4.3 Section 3: Effect of Internet use on various Psycho-Social correlates.

4.3.1 General Physical Health

It was hypothesized that there will be significant differences in the general physical health of adolescents who are below average users and those who are above average users of the Internet.

The results of the present study confirm the conjectured hypothesis. The study observed that there were significant differences among the BAUs, AUs and the AAUs. However, significant differences were not seen between the AAUs and the SAAUs with respect to their general physical health. The results also indicate that there were no significant differences between the average and above average users. However, the average users did differ significantly with the below average and the significantly above average users. For example, a majority of the participants belonging to the AAU and the SAAU categories reported being concerned about their physical health, felt pain in their shoulders while being online for long durations and also complained about experiencing neck pains. A majority of the SAAUs also reported that they experienced severe pain in their wrists and experienced tingling pain in their hands and legs. The results indicate that while most of the AAUs and SAAUs experienced such problems most of the times, average users of the Internet experienced these problems only occasionally. Though the differences between AAUs and SAAUs were not significant, it was apparent that the severity of the problem may be higher in the SAAU group as compared to the AAUs.

The results of the present study also indicate a significant difference in the General Health of the participants residing in urban and rural areas. Participants residing in urban areas experienced more problems in terms of their physical health as compared to their Gujarati medium counterparts. However, the study did not find any significant difference in the

general physical health of male and female, participants studying in different grades or in English and Gujarati medium.

A review of previous literature suggests, that a form of tendinitis, called Nintendinitis as one of the serious documented injuries as a result of excessive computer gaming is a sports injury characterized by severe pain in the extensor tendon of the right thumb as a result of the repeated pressing of buttons during game play (Brasington, 1990). Excessive computer use while online might similarly impact young people's eyes, back and wrists, just as adults have reported such injuries as a result of prolonged computer use (Mendels, 1999). Excessive texting is also reported to lead to a new condition called texting tenosynovitis or a text-messenger's thumb, in which repetitive use leads to pain and tenderness of the thumb (Storr, de Vere Beavis, & Stringer, 2007). Tendon injuries, the Carpal tunnel syndrome, radiation related problems, inattention, blindness and computer vision syndrome are some of the common ailments that stem from incessant mobile use (Khosla, 2013).
Research focusing on the physical risks of playing computer games also suggests that children's extended computer use may be linked to increased risks of obesity, seizures and hand injuries (Subrahmanyam et al., 2000).

4.3.2 Mental Health

It was hypothesized that there will be significant differences in the mental health of adolescents who are below average users and those who are above average users of the Internet.

The results of the present study confirm the conjectured hypothesis. The results indicate that there were significant differences among the all four groups of Internet users in the context of their mental health. The results found that a majority of the above average users and those in the SAAU category reported suffering from an inferiority complex, feeling discouraged or

worthless, being impulsive, anxiety and depressed most of the times. However, only a few of the average users reported experiencing such feelings occasionally. Since below average users used less Internet, the number of participants reporting such feelings was also less.

The results also indicate that there was a significant difference in the mental health of male and female participants, among participants of different grades and those studying in English and Gujarati medium schools. For example, males tend to be more preoccupied, felt angry and frustrated when they were unable to use the Internet and experienced more anxiety and feelings of worthlessness and hopelessness as compared to females. Similarly, it was observed that English medium participants experienced feelings of loneliness, depression and dejected more often than Gujarati medium participants. It was also observed that while equal number of participants of Grades 9, 10 and 11, felt sad and discouraged, majority of those in Grade 10 felt depressed and rejected, while those in Grade 9 scored high on anxiety.

Many researchers and clinicians have noted that a variety of mental disorders co-occur with the Internet Addiction Disorder (IAD). A study by Dong, Lu, Zhou and Zhao (2011) reported that higher scores for depression, anxiety, hostility, interpersonal sensitivity and psychoticism were consequences of IAD (as found in the present study as well). Internet addiction in adolescents has been reported to be co-morbid with depression and insomnia (Cheung & Wong, 2011), suicidal ideation (Fu et al., 2010), attention-deficit hyperactivity disorder, social phobia and hostility (Ko et al., 2009), loneliness (Morahan- Martin & Schumacher, 2000; Caplan, 2003; Whang, Lee & Chang, 2003; Özcan, & Buzlu, 2005, 2007; Eldeleklioğlu, 2008; Kim, LaRose & Peng, 2009), schizophrenia, obsessive-compulsive disorder (Ha et al., 2006), aggression (Ko et al., 2009), drug use (Gong et al., 2009), and problematic alcohol use (Ko et al., 2008).

Adolescence is a stage of life in which adolescents have to deal with a lot of changes including those to their bodies, increased autonomy and relationships with peers and parents. Hence loneliness is quite common and intense during adolescence (Brennan, 1982). Lonely and depressed individuals turn out to have a higher preference for online interaction as they consider online communication as the "Prozac of social communication", relatively less risky and easier than face to face communication due to its anonymity (Morahan-Martin & Schumacher, 2000; Meerkerk, van den Eijnden, Vermulst, & Garretsen, 2007). The Internet, with all its anonymity and cluelessness, provides a platform to adolescents who are grappling with who they actually are. Research suggests that adolescents' loneliness is related to peer relations (Storch, Brassard, & Masia-Warner, 2003) as well as to self-esteem, family strengths and to mother-adolescent communication (Brage, Meredith & Woodworth, 1993). Degirmencioglu (1995) found that adolescents who had a cohesive and highly interconnected friendship network reported less loneliness, less depressed moods and more support from their friends.

Some studies have suggested that Internet addiction may also contribute to anxiety and stress in adolescents (Egger & Rauterberg, 1996). During this stage of life, major decisions regarding careers have to be made and hence adolescents' experience a lot of anxiety and stress. A few Indian studies have found Internet Addiction positively correlated to depression, stress and anxiety (Yadav, Banwari, Parmar& Maniar 2013; Panicker & Sachdeva, 2014). Their results imply that the more addicted a student was to the Internet, the more stress and anxiety he had. Those who suffer from anxiety and stress often have immense trouble interacting and communicating with others in a healthy, positive and meaningful way. These human characteristics are viewed as important determinants of Internet Addiction and some adolescents use this medium to cope with their stress and anxiety. It involves cognitive task

avoidance and engaging in activities with the implicit goal of distraction from the things one is supposed to do (Davis, Flett & Besser, 2002).

4.3.3 Social Health

It was hypothesized that there will be significant differences in the social health of adolescents who are below average users and those who are above average users of the Internet.

The results of the present study confirm the conjectured hypothesis. The results indicate significant differences among the BAUs, AUs and the AAUs, while no significant difference was observed between the SAAUs and the other three groups. For example, it was seen that a majority of the AAUs and SAAUs experienced social anxiety, lack of confidence and lack of companionship. They seldom felt there were friends who really understand them or to whom they can turn to in their difficult times. It was also observed that these participants were comfortable talking to only those people that they knew really well and most of the times were worried about performing anything new in front of others. Whereas, it was observed that the BAUs and the AUs were more comfortable doing new things in front of strangers, had cordial relations with their friends and family and did not lack self confidence. The results also indicate that those who were high on Internet use had low self-esteem, unhealthy familial and friendly relationships, feelings of introversion and insecurity, etc. Significant differences were observed in the social health of participants in English and Gujarati medium schools and in those residing in urban and rural areas. For example, it was seen that Gujarati medium participants faced more problems with their self confidence and self esteem than the English medium participants. This may probably be due to the lack of adequate exposure in terms of opportunities which build up their confidence level or self esteem.

Similarly more problems related to social health were seen among urban participants as compared to rural participants. Social anxiety, lack of companionship, lack of social support and less cordial relationships were observed among urban participants.

Previous researches on Internet addiction and its impact on social health have found that adolescents with high Internet use were significantly more likely to report dysfunctional and/or problematic familial relationships (Tsitsika et al., 2011). Various studies have indicated that both family dynamics and parenting styles are closely related to the development of Internet Addiction among adolescents (Yen et al., 2007; Weinstien & Lejoyeux, 2010). Particular parenting styles, which are either unsupportive or confrontational, have been associated with the development of Internet Addiction (Wells & Mitchell, 2008; Yen et al., 2009). Moreover, adolescents' perception of dysfunctional intra-familial relationships as well as dissatisfaction with such relationships have also been correlated to the development of Internet Addiction (Bernardi & Pallanti, 2009; Lam et al., 2009).

The results of the present study also indicate that those who were above average users of the Internet reported feelings of isolation and troubled relationships with their friends and families. Literature review on the high use of Internet (Internet Addiction or Compulsive Internet Use) and its possible impact on the social health have associated problematic peer relations and consequent social isolation as one of the factors in the development of Internet Addiction (Huang & Leung, 2009). Earlier authors have suggested that social isolation plays an important role in Internet dependence (Sanders et al., 2000). Social isolation or lack of social support from family or friends has also been thought to lead to problematic Internet use (Davis, 2001). Thus, people having feelings of social isolation, less social support and small social networks may more readily develop dependence on Internet activities.

Adolescents perceive the Internet as a platform of anonymity and that they can socialize with anyone across the world without revealing who they actually are. The Internet proves to be very useful for adolescents who experience social anxiety since they can maintain their anonymity on the net. Some of them do not fear doing anything new on the net since people do not know them or judge them by what they post online. Also, during this stage, adolescents tend to experiment with new, intimate relationships, especially with the opposite sex. The Internet provides a wide and unlimited range of people and groups with which one can interact and befriend. In order to fulfill their needs of intimacy and belonging, and to fill the void of lack of social support, or to overcome their anxiety, these adolescents tend to get hooked on to the Internet and social networking sites in particular, for longer periods of time. Research findings show that a large number of adolescents experimented with identity on the Internet by pretending to be someone else (Çetin & Ceyhan, 2014). Adolescents often tend to act being more intelligent, less shy and imaginary people on the Internet. Adolescents also reported that they experimented with identity to get to know people more easily and to speak with them more easily. Utilization of the Internet for the purposes of game playing and socialization may contribute to the development and further manifestation of Internet Addiction (Jang, Hwang & Choi, 2007).

Kim and Davis (2009) define low self-esteem as a function of perceived rejection, abandonment, or indifference by a significant other; thus, self-esteem should be related to problematic Internet use. Earlier studies have showed that self-esteem is correlated with Internet dependence (Armstrong, Phillips, & Saling, 2000; Yang & Tung, 2007; Douglas et al., 2008; Ko et al., 2009 ; Kim & Davis, 2009), and regression analysis in many studies have shown that low self-esteem significantly predicted Internet dependence (Kim & Davis, 2009; Meerkerk, van den Eijnden, Franken, & Garretsen, 2010 ; Bozoglan, Demirer, & Sahin, 2013). Those with low self-esteem had higher hours of Internet usage (Armstrong et al.,

2000; Douglas et al., 2008). Thus, low self-esteem should predict susceptibility to Internet dependence. Although many researchers have investigated the relationship between self-esteem and Internet dependence, only a few have focused on how self-esteem is related to Internet dependence.

Differences in the medium of instruction and area of residence may be attributed to the prevalence of Internet use. Since the prevalence of Internet is high among English medium participants and those residing in urban areas, there is a possibility that these participants score low on social health as compared to their Gujarati medium and rural participants.

4.3.4 Sleeping Habits

It was hypothesized that there will be significant differences in the sleeping habits of adolescents who are below average users and those who are above average users of the Internet.

The results of the present study confirm the conjectured hypothesis. It was observed that there were significant differences in the sleeping habits of participants who were below average users and those who were average or above average users of the Internet. Those who were above average Internet users reported not having fully rested sleep, feeling drowsy during the day due to lack of sleep, often experiencing jerks in their limbs during sleep and they also woke up feeling depressed or unhappy more often. While the below average and average users of the Internet reported having fully rested sleep and did not have any difficulty falling asleep or during their sleep.

Significant differences were observed in the sleeping patterns of males and females and those studying in English and Gujarati medium participants. The results indicate that males had more complaints of disturbed sleep, difficulty falling or staying asleep and felt drowsy during

the day as compared to females. Similarly, English medium participants reported having disturbed, dissatisfied sleep and felt drowsy during the day.

These findings are consistent with previous literature where high Internet use has been associated with irregular sleep patterns, insomnia, sleep apnea and nightmares (Kim et al., 2010, Choi et al., 2009). Chen and Gau's (2016) study demonstrates the temporal relationship between early and middle insomnia predicting Internet Addiction and subsequently predicting a disturbed circadian rhythm.

A possible explanation for Internet overuse during adolescence may be biological factors. The biological changes that occur during this stage are related to changes in adolescent sleep patterns, (called the delayed phase preference) and result in older adolescents going to bed later at night and also getting up later in the morning (Carskadon, Vieira, & Acebo, 1993). Adolescents may utilize this delayed bedtime to surf the net or visit social networking sites until they fall asleep. Since schools usually start early in the morning, sleeping late results in reduced sleep on school days. It has also been reported that adolescents sleep later on weekend nights and get up even later on weekend mornings in order to catch up with the chronic shortage of sleep that occurs during the week (Tarokh & Carskadon, 2008).

The results of a delay in falling asleep and dislocation of hours to begin and end sleep resulting from nocturnal computer use directly reflect on daily behaviour. Studies reported in literature have concluded that exchanging sleep at night by sleep during the day, even in the presence of a reasonable amount of sleep over a 24-hour period, is not enough to produce a good neurobehavioural performance compared to a night's sleep (Bulck, 2004; Van Dongen, Mainslin, Mullington & Dinges, 2003).

It has been observed that the presence of media (television or the Internet) in a child's bedroom delays bed time and wake-up time. Such children spend less time in bed and are

seen to be more tired the entire day as compared to those who do not have access to any form of media in their bedrooms (Bulck, 2004). Not sleeping or sleeping for just a few hours and not the required number of hours for proper sound sleep, may lead to impairments during wakefulness (Carskadon, 1990; Carskadon et al., 1993; Carskadon et al., 1997; Carskadon et al., 1998; Carskadon, Acebo & Jenni, 2004).

Differences observed in the sleeping patterns of male and female adolescents may be due to playing video games or using a computer before going to sleep. This has been associated with later bedtimes (Eggermont & Van den Bulck, 2006; Oka, Suzuki & Inoue, 2008), shorter total sleep durations (BaHammam, Bin Saeed, Al-Faris & Shaikh, 2006; Eggermont & Bulck, 2006; Oka et al., 2008), later waking times on weekends (Oka et al., 2008), increased daytime tiredness (Eggermont & Bulck, 2006) and poor overall sleep quality (Mesquita and Remião, 2007). While males are more into playing computer or video games, there is a high possibility that they have more disturbed sleep patterns as compared to females.

4.3.5 Eating Habits

It was hypothesized that there will be significant differences in the eating habits of adolescents who are below average users and those who are above average users of the Internet.

The results of the present study confirm the above hypothesis. The results indicate significant differences in terms of the eating habits of BAUs, AUs and AAUs. However, significant difference was not seen between the AAUs and the SAAUs. Results indicated that majority of the SAAUs and the AAUs reported not having meals with their families, often skipping meals or hardly feeling hungry during dinner time. The results also show that these participants seldom had wholesome meals and often munched on something while they were using the computer. Whereas, the BAUs and the AUs reported having proper wholesome

meals and did not skip their meals. Significant differences were also observed between both the genders, different grades and among English and Gujarati medium participants in terms of their eating habits. For example, it was observed that males tended to skip their meals in order to be online and preferred munching while on the Internet. Similarly, English medium participants reported skipping their meals in order to be online and did not have their meals with the family. The findings of the present study are supported by various previous researches where Internet addiction has been associated with adverse effects on several lifestyle related factors in adolescents. For example, Kim et al., (2010) found that high-risk Internet users eat smaller meals, have less of an appetite, skip meals, and snacked more than their potential-risk and normal-risk Internet user counterparts. Moreover, the diet quality of high-risk Internet users is poorer than that of potential-risk Internet users and no risk Internet users. Similar results were found by Kim and Chun (2005) who found a high incidence of skipping meals by Internet addicts. The high frequency of skipping meals, especially dinner, could be related to frequent snacking or munching while at the computer.

In the present study also it was observed that those who were above average users of the Internet tended to skip meals, preferred munching something while sitting on the net and more often did not have a proper time to have their meals, i.e., they had their meals whenever they felt like having them. Also, most of the participants reported feelings of heaviness in their stomachs while at the computer.

Savige et al., (2007) have also reported that adolescent heavy snackers skipped dinner more frequently than their non- or light-snacker adolescent counterparts. Bulck and Eggermont (2006) found that 25.3% of their sample was at an increased risk of skipping meals since they played computer games 4 times a week. However, those who played computer games for more than 4 times in a week were 10 times more likely to skip a meal. They also found that a

quarter of these participants ate faster at least once in a week in order to watch their favourite show on television or to play computer games.

Aspects of adolescents' lives that could mediate the inevitable weight gain during adolescence includes increasing or decreasing levels of physical activities (e.g., because of their involvement in or dropping out of organized sports) or increasing levels of sedentary activities, such as watching television and using the Internet. Sedentary pursuits such as playing computer games and sitting on the Internet for hours are also believed to be contributing to obesity or overweight in adolescents (Subrahmanyam et al., 2000).

Although there is limited research that documents a relationship between obesity and computer use, evidence does exist that obesity in children is linked to excessive television watching, that is, 5 or more hours per day (Gortmaker et al., 1996). As children spend increasing amounts of time in front of computer screens—in addition to time spent in front of television screens—they are likely to increase risks of obesity (Hill & Peter, 1998). Constantly sitting in one position for long hours, along with other lifestyle factors such as eating junk food in large portions and decreased physical exercise, leads to fat accumulation in the body resulting in obesity.

Proper nutrition and healthy eating habits play a crucial role in physical development and growth during adolescence. Malnutrition and unhealthy eating habits may lead to improper growth of a child and may make him underweight. It is therefore important for adolescents to form healthy dietary habits in order to grow and develop properly.

4.4 Conclusion

The Internet has become a very powerful tool of information and communication. As a developing country India has been embracing technological changes at a fast pace. Availability of high speed Internet and mobile phones have made lives easier for adults as

well as adolescents. Even the young children prefer to play online games rather than playing outdoor games and mingling with other children of their age. As with all other forms of technology, the Internet too has its pros and cons. Problems arising out of excessive Internet use have been studied across the world; these have also been found to be an emerging public health issue. Various research findings have highlighted that excessive use of the Internet adversely affects one's physical health, mental health and social well-being. However, there are limited studies establishing the prevalence of Internet addiction in India. Globally, a number of studies have tried to analyze risk factors associated with Internet addiction and the results of the present study provide evidence to support the findings of prior research in an Indian context. The results of the present study imply that 39.8% participants belong to the Below Average Users category. With the development of the technology, it is necessary for these participants to be aware of the uses of the Internet and develop an aptitude to use the same. Majority of the participants', 44.8%, belonged to the Average Users' category, which implies a healthy use of the Internet. While, there were around 15% participants who belonged to the AAUs and the SAAUs, which may be called the groups at risk for the development of Internet Addiction. More care and preventive measures need to be taken for these adolescents having multiple risk factors. Parents should be aware of their adolescents' online activities, so it may be necessary for health practitioners to educate parents about what is available and occurring on line. Lastly, adolescents need to be better informed on how to best use the Internet. We take it for granted that adolescents are savvy users of this technology, when it is not yet fully known how they make use of the Internet and how they incorporate information from the Internet into their lives. Online media literacy skills are necessary and should be developed among adolescents to make the best use of the Internet.

4.5 Implications

The present study has significant implications for parents, teachers, school counselors, health experts and care takers of children/adolescents. The implications of the study are summarized as below:

- The study identified the prevalence and nature of Internet use among gender, grades, medium of instruction in schools and in urban and rural areas. The findings can be utilized by parents, teachers and counselors to understand extent of Internet use among adolescents.
- The findings help in understanding the nature of Internet use in adolescents in terms of the number of hours spent surfing the net and what they do on the Internet. The findings will help parents, teachers and school counselors in understanding the purpose for which adolescents use the Internet and what on the Internet has them hooked for longer durations.
- The present study also identified the effect of Internet overuse on various health aspects of adolescents. These findings will help health practitioners, parents and teachers educate their children on the advantages and disadvantages of the Internet. They can create awareness on the use and abuse of the Internet.
- Knowing about the physical and mental health effects of Internet overuse on adolescents can help parents, teachers and other care givers apply intervention strategies to curb the use of the Internet by adolescents. For example, parents and other care givers can fix a time when the children are allowed to surf the net. A proper schedule of eating meals at the right time and sleeping at the right time will help children curb their use and not get addicted to the net.

- Knowing about the purpose of Internet use among adolescents can help parents, teachers and other care takers take adequate measures to compensate/replace Internet use with something in the real world that will help adolescents stay away from the virtual world.
- Additional steps to establish browsing centres, cyber cafés and mobile network towers in rural areas can be taken to bridge the gap and facilitate Internet use in these areas.
- The findings of the present study will also help administrators or teachers in conducting Internet literacy skills workshop for students in need.
- Administrators and educational personnel can take adequate measures to create awareness about various Internet sources, like e-journals, e-books and encyclopedias, in rural areas, which can impact the educational achievements of adolescents through Internet literacy programmes.

4.6 Limitations

- The present study was restricted to adolescents studying in Vadodara District only. Therefore, the results of the present study cannot be generalized for the entire adolescent population in India.
- Although a comparison was drawn among adolescents studying in English and Gujarati medium and those residing in urban and rural areas, the number of participants was not equal. There was not a fair representation of the English medium, Gujarati medium, urban and rural participants as a whole. Thus, the study results cannot be generalized to the entire English medium population or an entire Gujarati medium population.
- The present study focused only on negative health effects of Internet use and not the positive impact that it has on the adolescents.

4.7 Directions for Future Research

With the experience and findings obtained from this research, the following suggestions are offered for future research in this area:

- Additional research can be carried out using an equal number of participants from English and Gujarati medium schools and from rural and urban areas.
- Further research can be done to check the potential influence of a particular time of a day and a particular day in a week on Excessive Internet use.
- More research can be done to understand the causes that lead adolescents to use the Internet excessively.
- Additional research can be carried out to study the effect of Internet use on school adolescents' performance.
- Research can be carried out to study the prevalence of Cyber-Bullying among adolescents and the ways or coping strategies used by victims of cyber bullying.
- Further research can be conducted to study the usefulness of technology and of the Internet in particular.
- Additional research can be carried out to explore how Internet experiences or exposure to online information affects knowledge about health, attitudes and behaviour of adolescents.
- The efficacy of delivering Internet based therapies and prevention programmes can be another area of study.
- Research can be conducted to assess if certain personality factors are associated with the development of Internet Addiction.