群別：外語群

參賽作品名稱：**A Study of the Effect of Smartphone Addiction in Senior High School Students in Chia-yi City**

關 鍵 詞：**smartphone addiction, factors in addiction, syndromes of addiction**

**Abstract**

 The popularity of smartphones has given great convenience to our lives, while over the past years much research have often stated that smartphone addiction has gradually become a very serious problem. Therefore, the aim of the present study attempted to explore the definition of smartphone addiction, the possible factors in smartphone addiction, as well as smartphone use and smartphone addiction of senior high school students. This research involved two types of research methods: literature review and a survey. In this study, numerous articles and books were reviewed and organized to find the definition of smartphone addiction and the factors in smartphone addiction. Furthermore, this research adopted smartphone addiction inquiry questions. 100 senior high school students who came from four different departments participated in this study. The quantitative analysis of the questionnaires was carried out through descriptive statistics in order to indicate whether the subjects were addicted to smartphones. Results of this study reported that the students had smartphone addiction slightly. Likewise, the results of smartphone addiction inquiry questions were compatible with the results of the questions of self-report of addiction. The results showed that the students had a little anxiety of using smartphone; however, it seemed that dependence on smartphone use was not serious. Furthermore, the physical condition was influenced the students the most. Moreover, the students had difficulty focusing on their studies and work, but they still followed their original planned work. Finally, using the smartphone would not affect students’ social and interpersonal relationship. To conclude, this study may be of importance in explaining the syndromes of smartphone addiction in senior high school students in Chia-yi City, as well as in providing the students, parents and teachers with a better understanding of how to prevent smartphone addiction and treat it well.

**Keywords: smartphone addiction, factors in addiction, syndromes of addiction**

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**I. Introduction**

**I.1 Background of the Study**

The digital age has come. It has had a good influence and a dramatic change on this generation. Access to absorbing the new information, communicating with others, and bordering the interpersonal relationship are totally different from what we did before. Thanks to numerous new digital and electronic inventions, the information gathering and interpersonal communication and reaction are more convenient and swiftly. So far, two big inventions in this era have brought the world the huge impulse: the Internet and the mobile devices.

Over the past twenty years, the Internet becomes the best vehicle and channel to learn the first-hand news. Additionally, with the birth of the Internet, the instant message systems and programs have gotten popular and occupied the traditional approach to information transferring and the out-of-date communication channels, such as the hand-writing letter and the traditional telephone. Likewise, the development of the mobile device has had the powerful influence. The uses of these devices are convenient and prevalent today. These devices can carry out many works and applications. More and more people surf the Internet, take the online research, and connect with family and friends by using the computer and mobile devices like the tablet and the smartphone. These two new types of technology give us the new trends and change in our living styles and ways.

 The Internet and the mobile devices have such a strong influence. In order to understand its effect, in 2013 Research, Development, and Evaluation Committee of the Executive Yuan (RDEC) did a domestic survey which was called Individual/Household Digital Opportunity Survey. It showed that approximately 60% of the people aged 12 years old or above used and had their own smartphone. Interestingly and surprisingly, the average age of smartphone users decreased. The proportion of the smartphone users who were teenagers and adolescents was the highest. The people aged from 15 years old and 19 years old accounted for 76.8%, and the people aged from 20 years old to 39 years old accounted for over 80% of the smartphone users. Furthermore, smartphone use had the highest proportion of the personal information equipment for access to the Internet (86.1%). Besides, the survey showed that nearly 40% of the Internet users were addicted seriously.

As the above survey, it clearly presented that the teenagers of this generation use the smartphone a lot and depend on it heavily. Furthermore, many teenagers started to have the addiction to consumer electronics and become the “phubber” (謝文華, 2014). We can thus infer that there are huge group of teenagers who have the serious smartphone addiction. As a result, these phenomena of the smartphone overuse lead us to try to understand whether the senior high school students in Chia-yi have strong addiction on the smartphone or not.

**I.2. Purposes of the Study**

In light of these reasons, this study had three purposes: (a) to find out what is smartphone addiction, (b) to figure out the latent and possible factors in smartphone addiction; and (c) to investigate smartphone use and addiction of senior high school student. Particularly, in the current study, we paid much attention to the vocational high school students in Chia-yi City. The reliable questionnaire was used, and a lot of related data would be collected, reviewed, organized and analyzed.

**1.3. Research Questions**

In view of the research purposes, in the current study, four major sets of research questions to be addressed in this study are as follows:

1. What is smartphone addiction?
2. What factors cause smartphone addiction?
3. Are the senior high school students addicted to the use of the smartphone?

**II. Method**

**II.1. Subjects**

100 subjects in senior high school in Chia-yi City were recruited in this study. There were 41 males and 59 females. 46 subjects were Grade 1 and 54 subjects were Grade 2. 22 subjects were senior high school (SH), 27 subjects studied in the department of Applied Foreign Language (AFL), 18 subjects studied in the department of Data Process (DT), 20 subjects studied in the department of Tourism Industry (TI), 20 subjects studied in the department of Food and Beverage Management (FBM).

**II.2. Instruments**

**II.2.1. Literature Review**

In order to understand the detailed and precise information about smartphone addiction and the factors, we collect and study the related data and information, such as books, journal articles, and news. In addition, we studied and analyzed these data, and finally we organized and presented the collective findings of what is smartphone and what the factors result in smartphone addiction.

II.2.2. Smartphone-addiction Questionnaire

One of the main data collection instruments used in this study was the questionnaire. The questionnaire consisted of two parts: background information and smartphone-addiction inquiry questions. There were 5 questions in the part of background information, including gender, departments, grade, the course of having personal smartphone, and the questions of self-report of addiction. In the second part, the smartphone-addition inquiry questions were used based on Kwon et al’s(2013a, 2013b) study. According to Kwon et al’s research, these questions which were chosen in this study were valid and reliable. Because of the differences in the circumstances and habits of using the smartphone, some of the questions were revised and added in the questionnaire in order to be suitable for the current conditions and trends of Taiwanese students. Take a question about the frequency of the use of the social media for example. The original question asked the use of Twitter in the extent to smartphone addiction. Nevertheless, the people in Taiwan seldom used Twitter rather than the other instant message and social media like Line and Facebook. Thus, the instant message, Line, was substituted for Twitter in the question of the frequency of using social media and instant message. There were total of 15 questions in the smartphone-addition inquiry questionnaire.

**II.3. Procedure and Data Analysis**

 There were three phrases in this survey study. First of all, we collected the related data and information from the Internet and the libraries, such as books, news, magazines, and journal articles. Next, after studying the related data and questionnaires, we started to designed our own smartphone-addiction questionnaire. The questionnaire of the current study was mainly based on Kwon et al’s (2013a, 2013b) design, and we tried to choose the suitable questions. The teachers and some of our classmates would take the questionnaire before it was sent. It was mainly because we wanted to make sure whether the questions of the questionnaires were appropriate for our subjects. After countless revision, the questionnaires were sent to our subjects. Finally, we collected the questionnaires and analyzed them by Excel to get our results.

**III. Findings**

**III.1. Smartphone Addiction**

The smartphone, which is invented over a few years, is a brand-new type of the cellphone with the large screen and without the dials. The smartphone can be seen as a multi-task device, as distinct from the traditional phone or cellphone which only contains single function. The functions of the smartphone are not just in the traditional and single use (i.e., giving someone a call); but it also can be used to look for the data and instantly get in touch with others.

Due to the ever-improving technology, people used the cellphone more frequently than ever before, especially the smartphone (cf., RDEC, 2013). Consequently, based on the mentioned-above descriptions, smartphone addiction can be seen as a mixture of internet addiction (Kennedy, 2013; Kwon, et al., 2013a) and cellphone addiction (Kwon, et al., 2013a). On a basis of廖婉沂’s(2008) research, cellphone addiction refers to the behavior that the cellphone user has the overuse and misuse of the cellphone, the serious psychological dependence on cellphone and the impulsive disorder. On the other hand, internet addiction is described as the fact that the Internet users misuse the Internet, is out of order, and even lead the malfunction of living (Mok, et al., 2014). The similarities between these two types of addiction are (a) misuse or excessive use of the devices, systems and programs, and (b) the psychological and physical harm and living disorder. In addition to the psychological and physical effect, several researchers ((Mok, et al., 2014;陳昱文,2014; 鐘安淇, 2013; 鄭美萱, 2007) reported that cellphone would bring forth the social and interpersonal effect on the users’ lives. These kinds of addiction would alienate their family and real-life friends.

In conclusion, we can figure out that smartphone addiction, which is strongly related to the use of the cellphone and the Internet, can be defined as the behavior that makes the users rely on the online devices largely. Thus, the users’ psychological, physical and social condition could be influenced and be hurt mostly, that is, the damage of the users health, living conditions and interpersonal relationship.

**III.2. Factors in Smartphone Addiction**

 In order to prevent the people from using the smartphone too much and offer the useful treatment, how people are addicted to the smartphone is constantly studied and viewed as a central question in terms of the diagnosis and treatment of smartphone addiction. There were a lot of the previous articles and studies (Mok, et al., 2014;陳昱文,2014; 鐘安淇, 2013; 鄭美萱, 2007) indicated that cellphone addiction and smartphone addiction, or called problematic smartphone use, contained a variety of factors, and these factors can be related to physical, psychological, social, and interpersonal aspects. By studying, reviewing and organizing these literature, the study attributed smartphone addiction to five leading factors: (a) the escape from the troubles, reality, and responsibilities, (b) me generation, (c) I share therefore I am, (d) never feel lonely, and (e) the lack of interpersonal relationship in the real world.

The first factor in smartphone addiction is about “the escape from the troubles, reality, and responsibilities.” (Mok, et al, 2014; 陳昱文, 2014) It means that the people would use the smartphone APP and internet communicative programs to inform the other people so that they cannot avoid the embarrassment, conflict and disagreement when discussing or disagreeing with others. There are three major reasons taken into a consideration: (a) they just sent the messages, opinions and suggestions without pressure; (b) they can choose what they want to read and respond what supports them; and (c) they can ignore and delete what they do not like.

Next, another factor is “me generation.” (陳昱文, 2014) It suggested that the adolescents born in 1980s to 2000s have a new type of autophilia. That is, the teenagers always consider that everything around them were extremely important and they were self-centered. The teenagers only focuses on what they like and are interested in. They do not care other things that cannot attract their attention. As a result, they is used to posting every thoughts, movement, and the little details of daily life on the Internet or their own social media, whether it is meaningful or not.

The third factor is described as the “I share therefore I am” (Mok, et al, 2014; 陳昱文, 2014). Many of the internet and smpartphone addicts lack security and expect to receive wider recognition from others. Due to the rapid development of the technology, we can immediately receive others’ attention by the Facebook’s “Like” or feedbacks in the post. Some people seldom connect and interact with others in the real world, and even they lack the interpersonal communication ability. To gain wider recognition, they believe they shared the personal information or something partly-useful with others, and they could thus capture other’s attention. Therefore, these addicts do not change their condition, but they were isolated by themselves. They only lives in their own little world.

The fourth factor is related to loneliness, called “never feel lonely” (Mok, et al, 2014; 陳昱文, 2014). It is generally true that mostly people are afraid of loneliness. The people overusing smartphone cannot stand loneness any second. The situation of isolation and loneliness is easy to result them in anxiety, depression, fear and irritation (Mok, et al., 2014). Consequently, it is their first priority for the smartphone users to check their status on the social media, which is the only outlet for them, as frequently as they can. Through the virtual and immediate connection, they can relieve their loneness. However, it is not the solution. Instead, it can cause further mental problem. That is why more and more people start checking the smartphone as they have a little bit free time.

Eventually, the fifth factor is about “the lack of interpersonal relationship in the real world” (Mok, et al., 2014; 鄭美萱, 2007; 鐘安淇, 2013). At present, more and more people lack the ability of interpersonal relationship and have the social anxiety (鄭美萱, 2007). The interaction with others is a very difficult task for them. Nevertheless, it is impossible for them to exist in the world alone without others’ help and interaction. The indirect but useful access to building the relationship with the society is through the virtual world and interface, that is, social media, online games, and chat room. It is pretty easy for them to make friends in there. In addition, they can easily gain others’ recognition without interacting with the “real-life” person face to face.

According to the above review of the literature, smartphone addiction is composed of a good deal of factors. Basically, this kind of addiction can be divided into five major ones. Moreover, it is clear that all of the factors have the combination of various characteristics: physical, psychological, social and interpersonal aspects. Each factor contains two or more characteristics. For example, it is very obvious that the first factor “the escape from the troubles, reality, and responsibilities” have psychological, social and interpersonal aspects. Therefore, whenever the sources and factors in smartphone addiction are discussed and studied, the mixture of the physical, psychological, social and interpersonal aspects may be taken a consideration.

**III.3. Quantitative Results**

 In this section, whether the senior high school students in Chia-yi City have smartphone addiction would be analyzed and discussed. The results of the background information were presented: the course of having the personal smartphone and the questions of self-report of addiction. In terms of smartphone-addiciton inquiry questions, 15 questions would be divided into to five smartphone addiction syndromes: anxiety, dependence, physical effect, the effect of daily life, social effect on a basis of the characteristics of each question.

**III.3.1. Course of Having the Personal Smartphone**

How long the students have had their own smartphone are presented in this section before investigating and figuring out the condition of the students’ smartphone addiction.

Table 1 provides the course of having personal smartphone. In Table 1, 30 % of students had had their own smartphone 2 to 3 years. This was the highest number of all the subjects. Conversely, only 8 % of students started to use their own smartphone over five years. Furthermore, 19 % of students reported that they had had their own smartphone less than 1 year, 22 % of students used their own smartphone 1 to 2 years, and 21 % of students had the personal smartphone 3 to 4 years

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| Table 1. *The course of having personal smartphone* |
| 　 | N | Percentage |
| Less 1 year | 19 | 19.0% |
| 1 to 2 years | 22 | 22.0% |
| 2 to 3 years | 30 | 30.0% |
| 3 to 4 years | 21 | 21.0% |
| More than 5 years | 8 | 8.0% |
| Total | 100 | 100.0% |

In conclusion, it appears that the students started to have and use their own smartphone nearly one to four years. In other words, they have had their smartphone since they were the junior high school students. A few students use the smartphone when they are elementary school students.

**III.3.2. Self-report of Smartphone Addiction**

In order to understand whether the students had the self-perception about the extent to smartphone addiction, the second question in the part of background information is about addiction self-report question

The result in Table 2 showed that 75% of the students thought they had been addicted to the use of smartphone, but their symptoms were not serious but slight. They believed that the symptom of the addiction was under control. Furthermore, 21 % of students did not think they had had smartphone addiction. Only 3% of the students reported that they were seriously addicted to the use the smartphone.

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| Table 2. *Self-report of addiction* |
| 　 | N | Percentage |
| Disagree | 21 | 21.0% |
| Agree, but under control | 75 | 75.0% |
| Agree, and out of control | 3 | 3.0% |
| Total | 99 | 99.0% |

As a consequence, the result can demonstrate that over half of the students (over 78%) were addicted to the use of smartphone. However, most of them had confidence in controlling their smartphone use. Some of them believed that they did not have the problem of the overuse of smartphone addiction.

**III.3.3 Results of Smartphone Addiction**

In the part of the smartphone-addiction inquiry, there were total of 15 questions which reflected the students’ extent to smartphone addiction. These questions would be divided into five smartphone addiction syndromes: anxiety, dependence on smartphone use, physical effect, the effect of daily life, and social effect. The following parts would show the results of each question.

**III.3.3.1 Anxiety**

In terms of psychological effect on the excessive smartphone use, anxiety is one of the leading syndromes. Question 3, 5, 6, 7, and 15 were sorted as the category of anxiety.

Inquiry question 3 asked about auditory hallucinations without the company of the smartphone. The result (see Table 3) revealed that most of the students (68%) had not had the experience in auditory hallucinations even if they did not use the smartphone. Conversely, 15% of the students had such an experience but not seriously, and 17% of the students had such experience. It means that the students heard the ring sound very often. Therefore, we can conclude that that a majority of the students do not psychic and psychological problem, and they have no anxiety about missing the call.

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| Table 3. *Experiencing auditory hallucinations of smartphone sounds while not using a smartphone* |
| 　 | N | Percentage |
| Disagree | 68 | 68.0% |
| Slightly Agree | 15 | 15.0% |
| Agree | 17 | 17.0% |
| Total | 100 | 100.0% |

Table 4 responds inquiry question 5 which is related to “being stressed out when I cannot use the Internet.” The result yielded that 48.5 % of the students did not view whether they could use smartphone or not as a problem. However, some of them (25%) thought they had mild stress without connecting to the Internet. Likewise, others (26%) had great stress. Based on this result, it is clearly that, as far as the stress is concerned, students without using the Internet would have a good deal of stress.

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| Table 4. *Being stressed out when I cannot use the Internet* |
| 　 | N | Percentage |
| Disagree | 48 | 48.5% |
| Slightly Agree | 25 | 25.3% |
| Agree | 26 | 26.3% |
| Total | 99 | 100.0% |

Furthermore, the result of inquiry question 6 concerning about the power of the smartphone is displayed in Table 5. The results suggested that nearly half of the students (Slight Agree: 22%, Agree: 26%) cared whether they bring the whole charging pack in hand and charge their smartphone all the time. Otherwise, 52% of the students did not care whether they would run out of the power of the smartphone. Therefore, in terms of the concern about the power of the smartphone, there were no significant differences between these two groups of the students with various opinions.

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| Table 5. *Always preparing my charging pack to make sure that my smartphone is charged all the time* |
| 　 | N | Percentage |
| Disagree | 52 | 52.0% |
| Slightly Agree | 22 | 22.0% |
| Agree | 26 | 26.0% |
| Total | 100 | 100.0% |

What’s more, inquiry question 7 and question 15 directly inquired indirectly the anxiety syndrome of smartphone addiction. A more detailed understanding of this direct anxiety syndrome can be gained from Table 6. The result showed that there was no significant difference between the students of checking their messages and notification (Slight Agree: 30%; Agree: 31%) and those of not caring the notification from the smartphone (39%).

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| Table 6. *Constantly checking my smartphone so as not to miss conversations between other people on Line or Facebook* |
| 　 | N | Percentage |
| Disagree | 39 | 39.0% |
| Slightly Agree | 30 | 30.0% |
| Agree | 31 | 31.0% |
| Total | 100 | 100.0% |

Nevertheless, the result of the negative feelings of not using the smartphone (e.g., depression, anxiety and oversense) is depicted in Table 7. The result indicated that there were nearly half of the students (51%) who did not have such negative feelings. Moreover, 23% of the students reported they felt depressed and anxious a little without using the smartphone, and 26% of the students had strong negative feelings.

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| Table 7. *Feeling depressed, anxious, or oversensitive when I am not able to use my smartphone* |
| 　 | N | Percentage |
| Disagree | 51 | 51.0% |
| Slightly Agree | 23 | 23.0% |
| Agree | 26 | 26.0% |
| Total | 100 | 100.0% |

All in all, the students had anxiety, and even depression, as they used or could not use their smartphone. Analyzing these results carefully and in-depth, we can conclude that these students did not directly report that they had anxiety of smartphone use (see Table 6 and 7), while the results indirectly implied that they were anxious, either slightly or severely, as they could not use the smartphone or were using it. It is consistent with the their self-report of addiction.

**III.3.3.2. Dependence on smartphone use**

The second part of smartphone addiction syndromes is about dependence on the smartphone, including inquiry question 9, 10, 13, and 14. When asked the daily electric charge of the smartphone, as can be seen in Table 8, the results indicated that 43% of the students who could use the smartphone all day long without charging. 18% of the students reported that sometimes their smartphone cannot last for one whole day; moreover, there were 37% of the students whose fully charged battery did not last for one whole day.

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| Table 8. *My fully charged battery does not last for one whole day* |
| 　 | N | Percentage |
| Disagree | 43 | 43.9% |
| Slightly Agree | 18 | 18.4% |
| Agree | 37 | 37.8% |
| Total | 98 | 100.0% |

 In Table 9, the result about the expected time of using smartphone showed that 35 % of the students had better control of using the smartphone. Relatively, 28 % of them showed that they sometimes overuse their smartphone under their plan. Nevertheless, 36% of the students use their smartphone irregularly. It is obvious that approximately half of students have better control of smartphone use, whereas the others did not have proper control

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| Table 9. *Using my smartphone longer than I had intended* |
| 　 | N | Percentage |
| Disagree | 35 | 35.4% |
| Slightly Agree | 28 | 28.3% |
| Agree | 36 | 36.4% |
| Total | 99 | 100% |

 In addition, the result of the extent to missing smartphone use (see Table 10) demonstrated that 48% of the students could not miss to use smartphone even if they did not or were able to use it. There were 28% of the students who slightly missed to use smartphone and 24% of the students who strongly wanted to use the smartphone again as they did not or could not use it.

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| Table 10. *I will miss to use smartphone when I do not or cannot use the smartphone* |
| 　 | N | Percentage |
| Disagree | 48 | 48.0% |
| Slightly Agree | 28 | 28.0% |
| Agree | 24 | 24.0% |
| Total | 100 | 100.0% |

Finally, inquiry question 14 asked whether the students always take their smartphone in hand. As shown in Table 11, most of the students (Slight Agree: 20%; Agree: 44%) brought their smartphone in hand no matter where they were or they would go. Oppositely, only 36% of the students did not bring their smartphone all the time.

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| Table 11. *I always take my smartphone in hand* |
| 　 | N | Percentage |
| Disagree | 36 | 36.0% |
| Slightly Agree | 20 | 20.0% |
| Agree | 44 | 44.0% |
| Total | 100 | 100.0% |

The results of these analyses have implications that are the mirror image of the extet to the smartphone users’ dependence on smartphone use. Apparently, dependence on smartphone use is not the profound effect and syndrome that can influence on every student. Half of the students did not rely on the smartphone, others depended on it slightly, and still others needed it heavily. Therefore, it is not the main effect for the students.

**III.3.3.3. Physical effect**

In addition to psychological effect (i.e., anxiety and dependence on smartphone use), physical effect, one of main syndromes and effects, is analyzed in this study.

Inquiry question 2 and 12 were classified as the physical effect. Inquiry question 2 is about the self-perception and physical condition on inadequate sleep and tiredness of the overuse of the smartphone. As indicated in Table 12, it was similar to the preceding result showing that there were 46 % of the students without such the problem of inadequate sleep or tiredness. Moreover, 23 % of the students slightly lacked sleeping and felt tired by reasons of the use of the smarphone. Moreover, one-third of the students (31%) believed that they themselves had no enough sleeping and felt tired.

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| Table 12. *Feeling tired and lacking adequate sleep due to excessive smartphone use* |
| 　 | N | Percentage |
| Disagree | 46 | 46.0% |
| Slightly Agree | 23 | 23.0% |
| Agree | 31 | 31.0% |
| Total | 100 | 100.0% |

 The other question is about the physical damage mentioning the physical aches, headache and blurred vision. In Table 13, the result presented that the frequency of the students who did not have headache or blurred vision (56%) were more than those who have such syndromes but not seriously (18%) and those who have severe physical damages (24%) when they overuse the smartphone.

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| Table 13. *Experiencing lightheadedness or blurred vision due to excessive smartphone use* |
| 　 | N | Percentage |
| Disagree | 56 | 57.1% |
| Slightly Agree | 18 | 18.4% |
| Agree | 24 | 24.5% |
| Total | 98 | 100.0% |

With regard to physical effect, we can be viewed it as the important syndrome for the senior high school students. The physical damage (e.g., headache and blurred vision) is less influential than the physical condition (e.g., tiredness and inadequate sleep). Thus, smartphone addiction affects the physical condition and the users should focus on it much.

**III.3.3.4. The effect of daily life**

Another effect of smartphone addiction is about influencing on the addicts’ livings. In this section, we call it “the effect of daily life.” There are three questions of smartphone addiction inquiry questionnaire. They are inquiry question 1, 4 and 11.

Inquiry question 1 asked about difficulty in class, assignments and works due to using the smartphone. Table 14 showed that most of the students (46%) had no difficulty in concentrating in class, assignments and work. 25% of the students believed they were slightly affected in class and work by reasons of the use of the smartphone. 29 % of the students had strong influence on smartphone use when they were studying, doing homework and working. Thus, it was apparent that over half of the students had a hard time paying a little and much attention to their studies and work. We can briefly conclude that students had difficulty in concentration owning to smartphone use, but some were seriously and others were not.

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| Table 14. *Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use*  |
| 　 | N | Percentage |
| Disagree | 46 | 46.0% |
| Slightly Agree | 25 | 25.0% |
| Agree | 29 | 29.0% |
| Total | 100 | 100.0% |

The next is a direct question related to the living change, that is, whether the user will never give up using my smartphone even when my daily life is already greatly affected by it. As indicated in Table 15, the result showed that there were not seemingly differences between three opinions. Students who would give up using the smartphone and those who would not give up using the smartphone, respectively, accounted for 31%. 38% of the students reported that, when affected by the overuse of the smartphone, they were likely to give it up, but might not.

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| Table 15. *I will never give up using my smartphone even when my daily life is already greatly affected by it* |
| 　 | N | Percentage |
| Disagree | 31 | 31.0% |
| Slightly Agree | 38 | 38.0% |
| Agree | 31 | 31.0% |
| Total | 100 | 100.0% |

Eventually, inquiry question 11 asked whether the users would miss planned work because of smartphone use. The result (see Table 16) showed that over half of the students (59%) believed they would not forget and not miss any planned work despite the use of the smartphone. Some of them (20%) indicated that they sometimes forgot what they should do, and 21% of them reported that they frequently missed their work or plan.

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| Table 16. *Missing planned work due to smartphone use* |
| 　 | N | Percentage |
| Disagree | 59 | 59.0% |
| Slightly Agree | 20 | 20.0% |
| Agree | 21 | 21.0% |
| Total | 100 | 100.0% |

 On a basis of these results, most of the students reported that they were not affected by the smartphone. On the other hand, some of the students have mild or strong problems of the daily life because of smartphone use and addiction. These results, thus, implied that some part of the students had influence on their daily life. They need to pay considerable attention to it and they have to try to solve this problem.

**III.3.3.5. Social effect**

The last but not least syndrome is relevant to the social effect, or the effect of interpersonal relationship. Therefore, inquiry question 8 asked whether the subject has feeling that my relationships with my smartphone buddies are more intimate than my relationships with my real-life friends. Table 8 presented that the responses of the students’ social effect. It is obvious that the percentage of students who believed they still have good relationship with their family and friends in reality (63%) were far higher than those who have little difficulty in building relationship with real-life persons (18%) and those who cannot connect with or develop the relationship with others (18%). As a result, it can imply that so far the social effect is not the leading problem and difficulty for the students.

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| --- |
| Table 8. *Feeling that my relationships with my smartphone buddies are more intimate than my relationships with my real-life friends* |
| 　 | N | Percentage |
| Disagree | 63 | 63.6% |
| Slightly Agree | 18 | 18.2% |
| Agree | 18 | 18.2% |
| Total | 99 | 100.0% |

**IV. Discussion and Conclusion**

 This study has attempted to account for what is smartphone addiction, to figure out the possible factors in smartphone addiction, and to explore smartphone use and smartphone addiction of senior high school student. In this study, literature review, data analysis and their results are reported each research questions.

Research question 1 was about the definition of smartphone addiction. After reviewing the related studies, we find out that smartphone addiction is a mixed addiction that combines internet addiction with cellphone addiction. Therefore, smartphone addiction can be defined as a kind of behavior that makes the users rely on the smartphone so much that the smartphone users have the damage of their health and living conditions and strong influence on their physical, psychological and social conditions.

Research question 2 was addressed the factors in smartphone addiction. The current study revealed five factors: (a) the escape from the troubles, reality, and responsibilities, (b) me generation, (c) I share therefore I am, (d) never feel lonely, and (e) the lack of interpersonal relationship in the real world. All of these factors were related to the users’ psychological, physical and social condition. Further, each factors can cause serious addicted syndromes and influences on the smartphone.

Research question 3 asked whether the senior high school students addicted to the use of the smartphone. The results of the questionnaire analysis presented that most of the students had had their own smartphone for 1 to 4 years. Moreover, most of the students had the addiction syndromes slightly.

Based on smartphone addiction inquiry questions, we found out five smartphone addiction syndromes: anxiety, dependence on smartphone use, physical effect, the effect of daily life, and social effect. In terms of anxiety, the students had a little anxiety of using smartphone. Next, dependence on smartphone use seems not to be the serious syndrome for the students. The third syndrome was the physical effect. We find out that the physical condition like tiredness and lack of sleep influenced the students more than the physical damage like headache and blurred vision. What’s more, the effect of daily life presented different outcomes; the students had difficulty concentrating on their studies and work, but they still follow their original planned work. Finally, using the smartphone would not affect students’ social and interpersonal relationship.

The most important finding from these data and results suggests that most of the students in senior high school in Chia-yi City have smartphone addiction, but the addiction syndromes are not serious. This outcome is fairly consistent with that of the self-report of addiction. Therefore, these findings in self-report of addiction and smartphone addiction inquiry questions support the claim, reported above, that students do understand their own difficulty in smartphone use. They also know how serious their syndromes are. Therefore, we can realize that the students in senior high school in Chia-yi have clear and accurate perception of the extent to their smartphone use.

The discussion will open on a warning note: The students have accurate perception of their smartphone use, while they may be addicted to smartphone use increasingly as long as they spend more time using smartphone. Therefore, we still have to draw much attention to their smartphone use. So far they do not suffer from severe syndromes, but they may have the serious addict if they keep on using the smartphone without limitation and control. For these reasons, the parents and the teachers should spend more time taking care of children and students’ smartphone use. Sometimes, the parents and teachers must teach the students how to use their smartphone correctly and how to raise their self-perception of smartphone addiction. The preceding factors in smartphone addiction, which were organized in this study, should also let the students know, and thus they can avoid increased risk of smartphone overuse and smartphone addiction. On the other hand, the students themselves must also learn the pitfalls of smartphone overuse in order not to get addicted to it as easily and quickly as they can to ruin their own studies and even lives.

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