



The Effect of Home-based Daily Journal Writing in Korean Adolescents with Smartphone Addiction

Hyuk Lee, Min Jae Seo,
and Tae Young Choi

Department of Psychiatry, Catholic University of
Daegu School of Medicine, Daegu, Korea

Received: 5 August 2015
Accepted: 15 January 2016

Address for Correspondence:

Tae Young Choi, MD

Department of Psychiatry, Catholic University of Daegu School
of Medicine, 33 Duryugongwon-ro 17-gil, Nam-gu, Daegu
42472, Korea

E-mail: tyoungchoi@cu.ac.kr

Funding: This study was supported by a grant of the Korean
Mental Health Technology R&D Project, Ministry of Health &
Welfare, Republic of Korea (HM14C2238).

Despite the benefits of smartphones, many adverse effects have emerged. However, to date, there was no particular approach to treat or prevent smartphone addiction. The aim of this study was to evaluate the therapeutic effectiveness of a home-based daily journal of smartphone use (HDJ-S) in Korean adolescents. Three hundred thirty five middle school students participated in this study. The severity of smartphone addiction was measured using the Korean Smartphone Addiction Proneness Scale. The ability to control smartphone use was evaluated with the Motive Scale for Smartphone Regulation. We used the Parents' Concerns for Children's Smartphone Activities Scale to measure parental monitoring and supervision of adolescents' smartphone activities. The Korean Smartphone Addiction Proneness Scale classified subjects into high risk and non-high risk for smartphone addiction, according to total scores. Forty six participants (14%) were high risk for smartphone addiction. The high risk group performed the HDJ-S for two weeks, and the same scales were subsequently assessed. After performing the HDJ-S, the total scores of the Korean Smartphone Addiction Proneness Scale decreased significantly in the high risk group ($P < 0.001$). There was a significant increase in the total scores of the Parents' Concerns for Children's Smartphone Activities Scale in the high risk group between baseline and following two weeks of treatment ($P < 0.05$). The HDJ-S was effective for adolescents with smartphone addiction and increased the parents' concerns for their children's smartphone activities. We suggested that HDJ-S would be considered as a treatment and prevention for smartphone addiction.

Keywords: Home-based Daily Journal; Smartphone Addiction; Adolescent

INTRODUCTION

Offering the advantage of obtaining information ubiquitously, the rate of adolescent smartphone addiction is rapidly increasing in Korea. According to the Ministry of Science, ICT, and Future Planning (MSIP), the number of domestic subscribers to smartphones exceeded 32.72 million people in December 2012, 37.52 million in December 2013, and 40.56 million in December 2014 (1). The total number of new subscribers to smartphones decreased slightly in 2013 as compared with the previous year, however the rate of new adolescent subscribers in the 12-19 age range increased rapidly from 11.6% to 24.6% (2).

Although clinical evidence of disease entity about smartphone addiction was not clear, the addictive nature of smartphones for adolescents has already become a serious social issue in Korea. According to Diagnostic and Statistical Manual of Mental Disorders fifth edition (DSM-5), behavioral addiction was defined as a cluster of cognitive and behavioral symptoms, including progressive loss of control, tolerance, and withdrawal symptoms like the symptoms of substance use disorders. Especially, internet gaming disorder, which is analogous to substance use

disorder and gambling disorder, was added to section 3 as conditions for further study (3).

The smartphone addiction risk rate for Koreans aged 11 to 55 years old was reported to be 11.8% in 2013, increasing 0.7% from the previous year, with the addiction risk rate for adolescents being 25.5%, 2.9 times higher than that for adults (8.9%). Since the rate of adolescent smartphone addiction has increased every year from 11.4% in 2011, to 18.4% in 2012, to 25.5% in 2013, any alternative management of their addiction is an urgent necessity (4).

Adolescents are immature in their self-control, therefore they not only show addictive behaviors much easier than adults (5), but also use smartphones for group bullying or accessing various harmful media (6). According to a 2013 survey by MISP, those with a smartphone addiction risk showed a much higher rate of negative emotions and impulsions, and were more vulnerable to negativity related to family function, satisfaction of life, and self-control (4). Therefore, aggressive intervention is required in impulsive behavior, learning difficulties, and social withdrawal that smartphone-addicted adolescents may experience.

Several studies have reported the addiction and psychopathology of smartphone use in adolescents (7), however the majority of these discuss only the status of smartphone-addicted adolescents without any information regarding the parents' concerns for children's smartphone activities. In fact, the relationship between parents and children is known to play an important role in adolescents with internet addiction (8,9), and the Committee of Communication and Media of the American Academy of Pediatrics (AAP) suggested that the family need to be actively involved in adolescent addictions to all media (10).

Regarding this issue, the government has recently been involved several times, however there was a substantial lack of therapeutic involvement. Of note, it was reported that the accessibility of realistic smartphone addiction dropped to 6.5% after experiencing the smartphone addiction prevention program and to 0.2% after addiction counseling (4). Particularly in the case of adolescents, addiction intervention outside of school has realistic difficulties. A few programs have been designed to continuously work to rectify adolescents' behavior outside the boundary of school through the writing of a home-based daily journal (11,12), nevertheless no researchers have studied the application of addiction intervention into schools. Similarly, on the subject of primary insomnia, a study was reported attempting to rectify sleep hygiene through the writing of a sleep diary by the patients themselves (13). However, no researchers have studied the application of a home-based daily journal to smartphone-addicted adolescents.

In an effort to address this issue, in August 2014, the Daegu Catholic Wee Center (which helps students adapt to school by making a connection with the school, the local education authority and the local community), set up a program named 'Home-based Daily Journal of Smartphone use (HDJ-S) for the smart vacation' in the junior high school of Daegu Metropolitan City. Students in the first to third grade of the junior high school were encouraged to write the HDJ-S with their parents for two weeks. This enhanced the parents' concerns for their children's smartphone use through family education, and strengthened adolescents' self-control through motivation to regulate their smartphone use.

The purpose of this study is to evaluate the change in smartphone addiction level, motivation to regulate smartphone use, and parents' concerns for their children's smartphone use, through the writing of a two-week HDJ-S by adolescents who were at high risk of smartphone addiction and their parents.

MATERIALS AND METHODS

Subjects

This study selected students of a junior high school located in Daegu Metropolitan City. Three hundred and thirty-five students out of a total of 421 students participated in this study, and the

mean age was 13.13 years old. Male students constituted 155 subjects and female students constituted 180.

Demographic data and smartphone use pattern

We asked the subjects to self-report in terms of five categories such as age, gender, duration of smartphone use, time on the smartphone during weekdays/weekends, and the smartphone functions mostly used. 'Phone calls', 'SNS (Twitter, Facebook)', 'Chatting (Kakao Talk, My People, etc.)', 'Games', and 'Internet' were reported as the most-used smartphone functions, and each question had an answer scale from 1, 'never used' to 5, 'very frequently used'

Scale of Korean Youth Proneness to Smartphone Addiction

Regarding smartphone addiction levels, the 'Scale of Korean Youth Proneness to Smartphone Addiction' (14), which was developed in 2011 by the National Information Society Agency (NIA) for adolescents, was used. This scale contains a total of 15 questions and estimates smartphone addiction levels of adolescents through their self-reporting to each question on a scale of 1, 'absolutely not true' to 4, 'completely true'. This scale includes items such as maladjustment to daily life, directivity to the virtual world, withdrawal symptoms, and tolerance to smartphone addiction. Subjects were defined as high risk in the following cases; when total points were higher than 42, when maladjustment to daily life was higher than 14, when withdrawal symptoms were higher than 12, or when tolerance was higher than 13. The remaining subjects were considered not at risk. Cronbach's α for this scale is 0.880.

Motivation scale for smartphone regulation

The motivation to regulate smartphone use applies to the 'Life-style 4' (15) section of the 'Therapy manual for smartphone-addicted adolescents'. This contains a total of 23 questions, and the motivation to regulate smartphone use can be evaluated through the total self-reporting points for each question from 1, 'absolutely not true' to 5, 'completely true'.

Scale of parents' concerns for children's smartphone activities

'Parents' checklist' (16) from the 'Therapy manual for smartphone-addicted adolescents' is used for parents to assess their concerns for their children's smartphone activities. This scale has a total of 7 questions with a scale from 1, 'absolutely not true' to 7, 'completely true'. If the total points are high, the parents have an interest in, and concerns for their children's smartphone activities, and we were able to compare the change in parents' concerns for their children's smartphone activities before and after performing the HDJ-S.

Home-based daily Journal of smartphone use (HDJ-S)

The HDJ-S was developed by Tae Young Choi and the Daegu Catholic University research team in Korea, based on cognitive behavioral therapy (CBT) homework for severe internet-addicted adolescents (created by the Chung-Ang University research team in 2007) (17), and the sleep diary for children with ADHD (created by the Yeungnam University research team in 2012) (18). Subjects performed the HDJ-S for two weeks during the summer vacation from a junior high school in Daegu Metropolitan City. The HDJ-S consisted of 'time per day using the smartphone,' 'smartphone contents used,' 'locations where the smartphone was used' and 'reflective self-evaluation.' They were forced to discuss their problem with their parents and to communicate with each other on topics such as the feelings of using the smartphone and the wish of playing games. They performed the HDJ-S every day for two weeks, with a checklist regarding smartphone use. Finally, we asked them to modify their behaviors by themselves after discussing with their parents.

Statistical analysis

SPSS version 19.0 (SPSS, Inc., Chicago, IL, USA) was used in the statistical analysis for this study, and a *P* value of 0.05 indicates statistical significance. The average comparison between two groups with quantitative variables was carried out using a two-sample *t*-test, and a χ^2 test was used for the analysis of categorical data. In addition, we used a paired *t*-test to evaluate the chan-

ge in smartphone addiction level, motivation to control smartphone use, and parents' concerns for their children's smartphone activities through the writing of an HDJ-S for two weeks.

Ethics statement

This study was approved by institutional review board of the Daegu Catholic University Medical Center (DCUMC IRB approval No. CR-15-038). Informed consent was exempted by the board due to deidentified data.

RESULTS

Characteristics of the study population according to the level of the Korean Scale of Proneness to Smartphone Addiction

This study includes a total of 335 adolescent subjects, having 155 males and 180 females. Among the subjects, those not at a high risk of smartphone addiction comprised 289 adolescents and those at a high risk were 46 adolescents (Fig. 1). When comparing those at high risk with those not at risk, there was no dif-

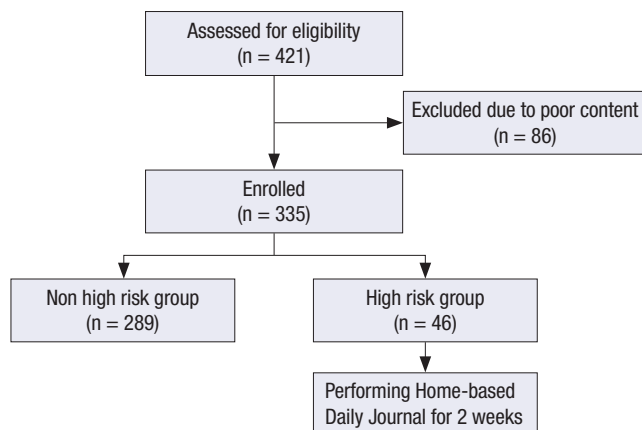


Fig. 1. Flow of subjects in the present study of Home-based Daily Journal Writing in Korean Adolescents with Smartphone Addiction.

Table 1. Characteristics of the study population according to the Korean Scale for Proneness of Smartphone Addiction

Parameters	No. (%) or Mean \pm SD (n = 335)		P value
	Non high risk group (n = 289)	High risk group (n = 46)	
Age, yr	13.12 \pm 0.81	13.22 \pm 0.89	0.461
Sex			0.008*
Male	142 (49.1)	13 (28.3)	
Female	147 (50.9)	33 (71.7)	
Duration of smartphone use			0.479
Under 1 yr	41 (14.2)	4 (8.7)	
More than 1 yr-Under 2 yr	75 (26.0)	9 (19.6)	
More than 2 yr-Under 3 yr	102 (35.3)	20 (43.5)	
More than 3 yr	71 (24.6)	13 (28.3)	
Time on smartphone use for a day, hr			
Weekday	2.67 \pm 2.05	3.46 \pm 2.05	0.016*
Weekend	3.31 \pm 2.22	4.7 \pm 3.08	0.005*
Smartphone functions mostly used			
Telephone calls	2.90 \pm 1.16	3.07 \pm 1.36	0.437
SNS (Twitter/Facebook etc.)	2.63 \pm 1.44	3.22 \pm 1.53	0.011*
Online chat (Kakaotalk/My people etc.)	3.46 \pm 1.26	3.93 \pm 1.24	0.018*
Game	2.55 \pm 1.37	2.50 \pm 1.44	0.819
Internet	3.09 \pm 1.26	3.28 \pm 1.31	0.331

SD, standard deviation.

*A statistically significant difference between groups.

Table 2. The mean scores of several measures before and after performing the HDJ-S

Measures	No.	Before performing HDJ-S		After performing HDJ-S		<i>t</i>	P value
		Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD		
Korean smartphone addiction proneness scale	46	36.93 \pm 4.40	33.59 \pm 4.59	5.87	< 0.001*		
Motive scale for smartphone regulation	43	70.79 \pm 17.50	71.35 \pm 16.56	-0.34	0.737		
Parents' concerns of children's smartphone activities scale	38	31.45 \pm 5.95	33.11 \pm 7.54	-2.04	0.049*		

SD, standard deviation; HDJ-S, home-based daily journal of smartphone use.

*A statistically significant difference between before and after performing the HDJ-S.

ference in age or duration of smartphone use, however the ratio of female to male, and the time using the smartphone per day was significantly higher in those at high risk (Table 1). According to the most-used smartphone functions, those at high risk spent significantly more time using Social Networking Services (SNS) and chatting than those not at risk.

The changes in mean scores of several measures after performing the HDJ-S

After performing the HDJ-S, the adolescents at high risk showed a significant decrease in smartphone addiction ($t = 5.87, P = 0.000$), however no significant change was found in the motivation scale for smartphone regulation ($t = -0.34, P = 0.737$). The change in parents' concerns for their children's smartphone activities significantly increased after performing the HDJ-S ($t = -2.04, P = 0.049$) (Table 2).

DISCUSSION

In terms of smartphone addiction in adolescents, to our knowledge this is the first study that has attempted to improve smartphone addiction, motivation to regulate smartphone use, and parents' concerns for their children's smartphone activities, using a home-based daily journal. In this study, performing the HDJ-S significantly decreased the smartphone addiction level and increased parents' concerns of their children's smartphone activities.

In those at high risk of smartphone addiction, the ratio of female to male was significantly higher. A previous study also reported that females have a more intense attachment to their smartphone and spend more time than males (19). However, this is different to a previous study of internet addiction, in which the ratio of male to female was much higher (20). This difference is assumed to be due to the fact that the characteristics of smartphones are ubiquitous in the application of social communication compared with other media such as computers. In fact, the previous study indicated that males only wanted to use the internet in their spare time, but females tended to apply it as a tool to communicate with others (21). Another previous study suggested that females scored a significantly higher smartphone addiction level, because females have socially-related motives for using smartphones compared with males who have more utilitarian and entertainment motives (22). In the present study, a significantly higher rate of SNS and chatting was found in those with high risk of smartphone addiction compared with those that were not at risk, and this could be considered in terms of gender.

Performing the HDJ-S for two weeks showed a significant decrease in smartphone addiction. Therefore, this suggests that performing the HDJ-S in smartphone-addicted adolescents can significantly reduce their addiction with limited therapeu-

tic involvement, by promoting changes in personal behavior after self-evaluation, and making them more aware of self-control and critical thinking (23). Performing the HDJ-S was similar to CBT, which replaces maladaptive coping skills, cognition, emotions and behaviors with more adaptive ones (24). In particular, due to the attempt to solve current problems and change unhelpful thinking and behavior, the HDJ-S would be effective for a variety of conditions including substance addiction and internet/game addiction. Additionally, currently requiring cognitive behavioral therapy out of school, performing the HDJ-S has taken an important step in the continuous rectification of cognition and behavior in addicted adolescents.

After performing the HDJ-S, a significant difference in the motivation to regulate smartphone use was not seen. Considering that smartphone addiction in those with a high risk has already been decreased through the HDJ-S, it is difficult to conclude that the HDJ-S does not affect motivation to regulate smartphone use. In addition, due to the fact that performing the HDJ-S faced a time limitation during the summer vacation at one junior high school in Daegu Metropolitan City, an additional long-term HDJ-S study of the motivation to regulate smartphone use may be required in the future.

A significant increase in the change in parents' concerns for their children's smartphone activities after performing the HDJ-S was verified. In a previous study, through family treatment over three weeks, the increase in the activity of the Caudate nucleus was seen by functional magnetic resonance imaging (fMRI) in game-addicted adolescents, relatively similar to smartphone addiction, which is highly related to parents' affinity (25). In addition to this, it has been shown that personal stress from environmental factors can have a negative influence on smartphone addiction, and several studies have reported that some symptoms such as depression, nervousness, physical disease, delinquency, and aggression are directly related to smartphone addiction (6,26). Therefore, if a negative relationship with parents exists in adolescence, when emotional attachment is highly important, it may pose a high risk for the development of smartphone addiction, by inducing emotional instability easier than it would in adults. Based on this, family therapy is inevitably necessary so that the HDJ-S has an important therapeutic value in the improvement of the relationship between parents and children, away from the therapeutic boundary of schools and hospitals.

There are a few limitations of the present study. Firstly, the applied self-reporting was not standardized for the motivation to regulate smartphone use or for parents' concerns for their children's smartphone activities. This study was based on the "Therapy manual for smartphone-addicted adolescents" announced by the Ministry of Gender Equality & Family (MOGEF), and it would be considered to have more meaningful results if a standardized scale is developed. Secondly, with the limitation

of self-reporting scales, there is the possibility of a reduced or magnified report of the adolescents' ideas or symptoms (27). To address this problem, we attempted to obtain objective information by allowing parents to be involved with the HDJ-S, however the confidence in the information is limited because a clinician was not directly involved. Thirdly, due to the fact that the time performing the HDJ-S was limited to only two weeks, the effects of a long-term HDJ-S study may be required. Considering that previous studies regarding home-based journals performed for the purpose of pedagogy were longer than 15 weeks, we could expect additional therapeutic effects in smartphone-addicted adolescents after performing the HDJ-S for longer than two weeks. Lastly, due to the fact that the study was carried out in just one junior high school, the subject sample cannot accurately represent the entire population.

Many issues about smartphone addiction have been developed mostly in Korea, and the reports in other country have been still limited. Although a number of researchers wouldn't recognize the severe situations of smartphone addiction, pharmacological treatment, cognitive behavior therapy, family therapy, motivational interviewing and camp programs based on internet gaming disorder have been applied. Unfortunately the evidence of these treatments is still insufficient (28-30). For this reason, a systemized treatment guideline for smartphone addiction was not developed yet. Therefore, we insisted that the HDJ-S could be very helpful in the treatment of adolescent addictions in an actual clinical situation, because performing the HDJ-S in smartphone-addicted adolescents can significantly reduce their addiction with limited therapeutic involvement, away from the therapeutic boundary of schools and hospitals. Additional long-term studies should be performed with a more aggressive therapeutic intervention.

DISCLOSURE

The authors have no potential conflicts of interest to disclose.

AUTHOR CONTRIBUTION

Study concept and coordination: Choi TY. Study design: Choi TY, Seo MJ. Data collection and analysis: Choi TY, Seo MJ, Lee H. Writing manuscript: Lee H. Discussion and manuscript revision: Choi TY, Seo MJ, Lee H. Manuscript approval: all authors.

ORCID

Hyuk Lee <http://orcid.org/0000-0003-4716-3360>
 Min Jae Seo <http://orcid.org/0000-0001-5163-7771>
 Tae Young Choi <http://orcid.org/0000-0003-2677-9297>

REFERENCES

1. Ministry of Science, ICT and Future Planning (KR). The demographics of domestic subscribers to smartphones: 2014. Available at <http://www.msip.go.kr/web/msipContents/contents.do?mId=MTQ2> [assessed on 6 December 2015].
2. Korea Internet & Security Agency. Analysis of domestic smartphone use pattern. Available at <http://www.kisa.or.kr/uploadfile/201306/201306101747173061.pdf> [assessed on 6 December 2015].
3. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 5th ed. Arlington, VA: American Psychiatric Association, 2013.
4. National Information Society Agency (KR). The survey on the side effect of internet addiction: 2013. Available at http://www.nia.or.kr/bbs/board_view.asp?boardid=201408061323065914&Order=020403&id=13174 [assessed on 6 December 2015].
5. Gladwin TE, Figner B, Crone EA, Wiers RW. Addiction, adolescence, and the integration of control and motivation. *Dev Cogn Neurosci* 2011; 1: 364-76.
6. Sansone RA, Sansone LA. Cell phones: the psychosocial risks. *Innov Clin Neurosci* 2013; 10: 33-7.
7. Seo MJ, Choi TY, Woo JM, Kim JH, Lee JH. A comparative study of smartphone and internet addiction on adolescent psychopathology. *J Korean Soc Biol Ther Psychiatry* 2013; 19: 154-62.
8. Ko CH, Wang PW, Liu TL, Yen CE, Chen CS, Yen JY. Bidirectional associations between family factors and internet addiction among adolescents in a prospective investigation. *Psychiatry Clin Neurosci* 2015; 69: 192-200.
9. Jang JH. The impact of parent's rearing attitudes on internet addiction among adolescent: the needs of internet use as mediating variable. *Korean J Couns* 2004; 5: 113-28.
10. Council on Communications and Media (US). Children, adolescents, and the media. *Pediatrics* 2013; 132: 958-61.
11. Oh SM. The effects of writing a learning journal on elementary students' English achievement and self-directed learning ability [master's thesis]. Seoul: Seoul National University of Education, 2014.
12. Chang J. Developing self-directed learning by keeping English reflective journals. *J Res Ins Curriculum Instr* 2009; 13: 697-716.
13. Jernelöv S, Lekander M, Blom K, Rydh S, Ljótsson B, Axelsson J, Kaldo V. Efficacy of a behavioral self-help treatment with or without therapist guidance for co-morbid and primary insomnia--a randomized controlled trial. *BMC Psychiatry* 2012; 12: 5.
14. Internet Addiction Prevention Center (KR). Development of Korean smartphone addiction proneness scale for youth and adults. Available at https://www.iapc.or.kr/info/mediaAddc/showInfoMediaAddcDetail.do?article_id=ICART_0000000003777&board_type_cd=A1 [assessed on 6 December 2015].
15. Department of Education, Seoul National University. Individual Counseling Manual for Smartphone Addiction. Seoul: Ministry of Gender Equality & Family, 2013, p14.
16. Korea Youth Counseling & Welfare Institute. Parent Education Program Manual for Smartphone Addiction. Seoul: Ministry of Gender Equality & Family, 2013, p7.
17. An DH, Lee YS, Sin YC, Jung SA, Jung ES, Kim JW, Lee JY, Choi TY. Business for Treatment & Rehabilitation of Serious Internet Addiction. Seoul:

- Korean Academy of Child & Adolescent Psychiatry, 2007.
18. Lee SH, Seo WS, Sung HM, Choi TY, Kim SY, Choi SJ, Koo BH, Lee JH. Effect of methylphenidate on sleep parameters in children with ADHD. *Psychiatry Investig* 2012; 9: 384-90.
 19. Geser H. Are girls (even) more addicted?: some gender patterns of cell phone usage. Available at http://socio.ch/mobile/t_geser3.pdf [assessed on 6 December 2015].
 20. Rees H, Noyes JM. Mobile telephones, computers, and the internet: sex differences in adolescents' use and attitudes. *Cyberpsychol Behav* 2007; 10: 482-4.
 21. Weiser EB. Gender differences in internet use patterns and internet application preferences: a two-sample comparison. *Cyberpsychol Behav* 2004; 3: 167-77.
 22. Roberts JA, Yaya LH, Manolis C. The invisible addiction: cell-phone activities and addiction among male and female college students. *J Behav Addict* 2014; 3: 254-65.
 23. Ramli A, Joseph L, Lee SW. Learning pathways during clinical placement of physiotherapy students: a Malaysian experience of using learning contracts and reflective diaries. *J Educ Eval Health Prof* 2013; 10: 6.
 24. Young KS. Cognitive behavior therapy with internet addicts: treatment outcomes and implications. *Cyberpsychol Behav* 2007; 10: 671-9.
 25. Han DH, Kim SM, Lee YS, Renshaw PF. The effect of family therapy on the changes in the severity of on-line game play and brain activity in adolescents with on-line game addiction. *Psychiatry Res* 2012; 202: 126-31.
 26. Seo CM, Lee JH, Choi TY, Kim JH, Shin IH, Woo JM. Study for relations between smart-phone addiction level and Korea youth self report. *J Korean Soc Biol Ther Psychiatry* 2012; 18: 223-30.
 27. Achenbach TM. Manual for the Child Behavior Checklist/4-18 and 1991 Profile. Burlington, VT: Department of Psychiatry, University of Vermont, 1991.
 28. Jäger S, Müller KW, Ruckes C, Wittig T, Batra A, Musalek M, Mann K, Wöfling K, Beutel ME. Effects of a manualized short-term treatment of internet and computer game addiction (STICA): study protocol for a randomized controlled trial. *Trials* 2012; 13: 43.
 29. Miller WR, Rollnick S. Motivational Interviewing: Preparing People to Change Addictive Behavior. New York, NY: Guildford Press, 1991.
 30. Liu C, Liao M, Smith DC. An empirical review of internet addiction outcome studies in China. *Res Soc Work Pract* 2012; 22: 282-92.