CrossMark

Effect of sports participation on Internet addiction mediated by self-control: A case of Korean adolescents

Jae-Ahm Park [a], Mi-Hyang Park [a], Ji-Hye Shin [b], Bo Li [c, *], David Thomas Rolfe [d], Jong-Yeol Yoo [e], Stephen W. Dittmore [e]

[a] Department of Sports and Leisure Studies, Daegu University, Gyeong-San, 712-714, South Korea
[b] Department of Language and Literacy, Georgia State University, Atlanta, GA, 30302, USA
[c] Department of Kinesiology, St Ambrose University, Davenport, IA, 52803, USA
[d] Department of Family and Consumer Sciences, Central Washington University, Ellensburg, WA, 98926, USA
[e] Department of Health, Human Performance and Recreation, University of Arkansas, Fayetteville, AR, 72701, USA

ARTICLE INFO

ABSTRACT

Internet addiction among adolescents has become a major social problem. Thus, more effective Internet addiction treatment programs through sports are required. This study tried to identify the relationship among sports participation, self-control, and Internet addiction among Korean adolescents. In total, 345 students (aged 15—18 years) from two middle schools and two high schools in South Korea were analyzed using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM).

SEM indicated a significant effect of sports participation on Internet addiction mediated by self-control. The results suggest the effectiveness of and need for sport and physical activity in Internet addiction treatment programs and for other addictions as well. Moreover, sports participation has a wider variety of psychological and physical benefits unlike intervention strategies or pharmacological treatments. Thus, the adoption of sports needs to be broadened from physical development to treating diverse psychological problems among adolescents.

Introduction

Young (1998) defined addictive Internet use as "an impulse control disorder that does not involve an intoxicant" (p. 238), and suggested that this new clinical disorder of Internet addiction has similar traits as drug or gambling addictions. Internet addiction is explained as spending more than 38 h per week for pleasure in online activities and having academic, social, financial, and physical problems due to Internet use (Young & Rogers, 1998). The habit-formation of addiction explains that a low level of self-control makes people accept the current tolerance and over-consumption, even if it has larger future costs (Becker, Grossman, & Murphy, 1994; Chapman, 1998; O'Donoghue & Rabin, 1999). The incentive effect, in contrast, is likely to alleviate over-consumption as a result of a high level of self-control (O'Donoghue & Rabin, 1999). Therefore, self-control is one of the most important psychological factors affecting addiction and impulse (Baumeister, 2003; O'Donoghue & Rabin, 1999; Trimmel & Kopke, 2000).

O'Donoghue and Rabin (1999) defined self-control deficit as a time-inconsistent taste for immediate gratification for the consumption of harmful addictive products. Similarly, Baumeister (2003) found that the absence of self-control may cause addictive behavior. Trimmel and Kopke (2000) studied alcoholic patients and reported that a level of self-control is negatively related to alcohol consumption.

* Corresponding author.
  E-mail address: libo@sau.edu (B. Li).
Peer review under responsibility of Kasetsart University.

Prior studies also provided the evidence that self-control affects Internet addiction in particular (Kim, Namkoong, Ku, & Kim, 2008; Mehroof & Griffiths, 2010). Kim et al. (2008) analyzed 1,471 online game users and found that aggression and narcissistic personality traits are positively correlated with online game addiction while self-control is negatively correlated with online game addiction. Mehroof and Griffiths (2010) examined 123 university students to identify how various personality traits affect individuals' Internet gambling addictions. Their results also suggested significant relationships between online gambling addiction and aggression, self-control, sensation seeking, trait anxiety, state anxiety, and neuroticism. Specifically, self-control was negatively related to Internet gambling addictions.

Sports participation has many advantages of psychological and physical well-being such as decreasing anxiety, depression, and stress (Hassmén, Koivula, & Uutela, 2000; Salmon, 2001; Scully, Kremer, Meade, Graham, & Dudgeon, 1998; Warburton, Nicol, & Bredin, 2006). Specifically, prior studies have shown the effect of physical exercise and sport participation on self-control. Jonker, Elferink-Gemser, and Visscher (2011) analyzed 622 adolescents consisting of 428 elite athletes, 140 regional athletes, and 54 non-athletes. They found that adolescents who actively participate in sport indicated a higher level of self-control than those not engaged in sport. Therefore, the amount of time training in sports was positively associated with a higher level of self-control (Jonker et al., 2011).

Oaten and Cheng (2006) identified the effect of regular physical exercise on self-control. They examined a four-month physical exercise program with 24 undergraduate students. Participants were separated into two groups, with the first group joining the four-month physical exercise program directly and the second group waiting two months without exercise then joining a two-month physical exercise program. After four-month's investigation, Oaten and Cheng (2006) found that participants who were assigned to the first group improved their level of self-control more than participants in the second group. They concluded that physical exercises improved the participants' level of self-control, which was related to performance of their tasks and study. In addition, during the physical exercise program, the consumption of alcohol, caffeine, and smoking was also significantly decreased in both groups (Oaten & Cheng, 2006).

In another study, Jonker, Elferink-Gemser, Toering, Lyons, and Visscher (2010) investigated 292 students (aged 12—16 years) consisting of 128 elite soccer players and 164 non-athletes and found that the elite soccer players indicated a higher level of self-control than non-athletes.

Therefore, based on the details above, this study tried to identify the effect of sports participation on Internet addiction mediated by self-control among Korean adolescents.

Methodology

Sampling and Data Collection Procedure

In total, 388 students from two middle schools and two high schools in South Korea were invited to participate in a survey using the convenience sampling method. Of the 388 copies of the questionnaire distributed, 43 were discarded due to missing values resulting in 345 usable surveys. Of the research participants, males accounted for 17.7 percent and females accounted for 82.3 percent. Most students used the Internet 1—2 h daily (40.9%). Approximately 45 percent of the students did not participate in almost any physical activity. Participants' demographic information is presented in Table 1.

Instrument

A questionnaire measuring the research constructs and participants' demographic information was distributed. To measure Internet addiction, 18 items with six sub-factors consisting of disturbance of adaptive functions (3 items), addictive automatic thought (3 items), withdrawal (3 items), virtual inter personal relationship (3 items), deviate behavior (3 items), and tolerance (3 items) were adopted and modified from the Korean scale for Internet addiction self-diagnosis that was established by the Korean A for Digital Opportunity and Promotion (2003). In previous studies, the Korean scale for Internet addiction self-diagnosis has been found to have acceptable reliability, with Cronbach's alpha coefficients ranging from .76 to .85 (Oh, 2010; see Table 2). Items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicated a higher level of Internet addiction.

In total, 6 items for self-control were drawn from Song (1998) who established a self-diagnosis scale for self-control by developing and translating the Self-Control Rating Scale (SCRS) for children (Kendall & Wilcox, 1979).

Table 1
Demographic information ($n = 345$)

Variable	Category	Number	Upper limit
Gender	Male	61	17.7
	Female	284	82.3
Age	15	147	42.6
	16	47	13.6
	17	72	20.9
	18	79	22.9
Daily Internet usage (hours a day)	<1	101	29.3
	1—2	141	40.9
	3—4	81	23.5
	5—6	21	6.1
	>7	1	.2
Sport participation frequency	Almost nonet	155	44.9
	1—2 days/week	92	26.7
	3 days/week	32	9.3
	4—5 days/week	48	13.9
	6—7 days/week	18	5.2
Sport participation intensity	Very light breathing	31	9.0
	Light breathing	81	23.5
	Moderate breathing	170	49.3
	Heavy breathing	59	17.1
	Very heavy breathing	4	1.1
Sport participation duration	<10 min	41	11.9
	20 min	106	30.7
	30 min	106	30.7
	40 min	40	11.6
	>50 min	52	15.1

Table 2
Subscales adopted in the measurements

Subscale	Researcher	Cronbach's alpha
Disturbance of adaptive functions (3 items)	Oh (2010)	.85
Addictive automatic thought (3 items)		.81
Withdrawal (3 items)		.85
Virtual inter personal relationship (3 items)		.81
Deviant behavior (3 items)		.76
Tolerance (3 items)		.83
Self-control (6 items)	Song (1998)	.82

In Song's study (1998), the scale indicated acceptable reliability with a Cronbach's alpha coefficient of .82. A 5-point Likert-type response format was used with values ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores reflect a higher level of self-control.

Sports participation was measured using frequency, intensity, and duration that were adopted from Cho, Kwon, and Jeon's study (2010). The frequency question asked "During a week, how often do you participate in sports or physical exercise in your free time?". The frequency of sports participation was categorized into: almost none, 1—2 days/week, 3 days/week, 4—5 days/week, and 6—7 days/week. A 5-point Likert-type response format was used with values ranging from 1 (almost none) to 5 (6—7/week). The intensity of sports participation was categorized into very light breathing, light breathing, moderate breathing, heavy breathing, and very heavy breathing based on the amount of energy or effort expended in performing the activity. A 5-point Likert-type response format was used with values ranging from 1 (very light breathing) to 5 (very heavy breathing). The duration of sports participation was categorized into 10 min, 20 min, 30 min, 40 min, and more than 50 min. A 5-point Likert-type response format was used with values ranging from 1 (almost 10 min) to 5 (more than 50 min). The mean score of frequency, intensity, and duration was used for the analysis. Higher scores reflected a higher level of physical exercise and sports participation.

Data Analysis

Data were analyzed using AMOS version 20.0 and SPSS version 20.0 for Windows. In order to identify the relationships among sports participation, self-control, and Internet addiction; Structural Equation Modeling (SEM) was employed. The researchers used a two-step process (Anderson & Gerbing, 1988). A confirmatory factor analysis (CFA) was conducted to examine the psychometric properties of the measurement model before employing SEM. To examine the overall model fit, the following fit indices were assessed: χ^2/df (<5.0), the Root Mean Square Error of Approximation (RMSEA) (<.08), the Standardized Root Mean Squared Residual (SRMR) (<.08), and the Comparative Fit Index (CFI) (>.90) and the reliability of the constructs was evaluated through Cronbach's alpha, being more than .70 (Hair, Black, Babin, & Anderson, 2010). Discriminant validity was assessed based on Anderson and Gerbing's (1988) suggestion that if the confidence interval ($\pm$two standard errors) around the correlation estimate between the two factors does not include 1.0, it would have discriminant validity.

A bootstrapping procedure with 500 bootstrap samples and a 95% confidence interval (CI) was conducted to test the mediating effect of self-control on the relationship between physical education and Internet addiction (Zhao, Lynch, & Chen, 2010). Additionally, to test the moderation effect of gender and age, an independent t-test and one-way analysis of variance were employed.

Results

Confirmatory Factor Analysis

Cronbach's alpha ranged from .632 (deviate behavior) to .814 (addictive automatic thought). Although exceeding the .70 criterion is commonly used for research (Nunnally & Bernstein, 1994), prior studies also suggested a .60 cut-off (Churchill, 1979; Nunnally, 1978). Thus, all scales were deemed reliable. The standardized loadings ranged from .48 to .85. Nine items had loadings below the suggested .70 threshold (Nunnally & Bernstein, 1994). However, items were retained since previous studies suggested that they are theoretically relevant to their respective constructs (for example, Cha, 2012; Kim & Im, 2013; Song, 1998). The estimated correlations between the latent factors were not excessively high (e.g., >.85). In addition, the confidence interval ($\pm$two standard errors) around the correlation estimate between the two factors did not include 1.0. Therefore, it should have discriminant validity (Anderson & Gerbing, 1988). The final measurement model indicated an acceptable fit with SRMR = .044; RMSEA = .062; CFI = .940, [χ^2 (120) = 278.903, $p < .001$], χ^2/df ratio = 2.324 (Hair et al., 2010). The summary of basic statistics, factor loadings, and Cronbach's alpha are presented in Table 3.

Structural Equation Modeling

The final structural model (Figure 1) was estimated with the total sample ($n = 345$). The model fit for the data was good: χ^2 (268) = 500.273, $p = .000$; χ^2/df = 1.867; CFI = .926; SRMR = .051; RMSEA = .050. In the final structural model, physical activity had a significant influence on self-control ($\beta = .154$, $p < .05$) and self-control had a significant influence on Internet addiction ($\beta = -.142$, $p < .05$). In addition, sports participation had a significant influence on Internet addiction mediated by self-control ($\beta = -.022$, $p < .01$). Nevertheless, only 2 percent of the variance in Internet addiction was accounted for by physical activity and self-control requiring further research. A summary of the final structural model is presented in Table 4.

Discussion

This study tried to identify the relationship among sports participation, self-control, and Internet addiction in order to provide valuable data for theoretical and practical implications of sports in Internet addiction prevention and treatment programs. As we expected, the results indicated

Table 3
Summary of basic statistics, factor loadings, and Cronbach's alpha

	M	SD	λ	α		M	SD	λ	α
DAF1	1.61	.863	.851	.810	DIB1	1.38	.672	.730	.632
DAF2	1.38	.710	.715		DIB2	1.10	.391	.516	
DAF3	1.39	.743	.746		DIB3	1.33	.688	.612	
AAT1	1.58	.825	.762	.814	TOL1	1.47	.785	.743	.781
AAT2	1.53	.807	.833		TOL2	1.37	.713	.810	
AAT3	1.65	.929	.733		TOL3	1.33	.712	.683	
WID1	1.20	.539	.756	.790	SCT1	3.24	.879	.617	.790
WID2	1.24	.592	.660		SCT2	2.99	1.073	.551	
WID3	1.27	.623	.819		SCT3	2.92	1.023	.531	
VIR1	1.19	.555	.798	.671	SCT4	2.68	1.015	.569	
VIR2	1.70	.910	.478		SCT5	2.72	.960	.720	
VIR3	1.19	.550	.816		SCT6	3.03	1.018	.738	

Note. M = mean, SD = standard deviation, λ = factor loading, α = Cronbach's alpha, DAF = disturbance of adaptive functions, AAT = addictive automatic thought, WID = withdrawal, VIR = virtual interpersonal relationship, DIB = deviate behavior, and TOL = tolerance, SCT = self-control
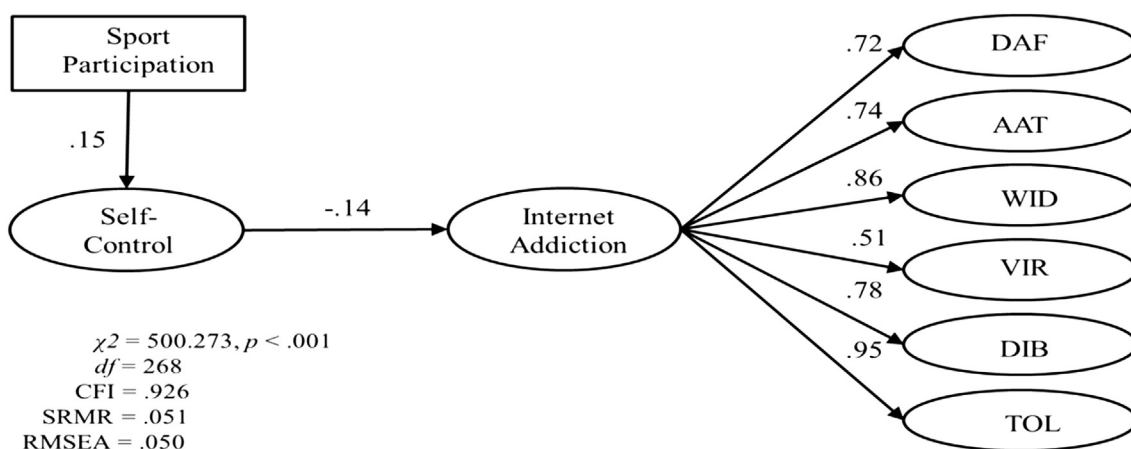

Figure 1 Proposed structural model
Note: Solid lines indicate significant paths at $p < .05$. Values shown next to the solid lines are standardized regression coefficients

that sports participation negatively affected Internet addiction mediated by self-control.

Although many prior studies reported an effect of sports participation on self-control (Jonker et al., 2010, 2011; Oaten & Cheng, 2006) and the effect of self-control on Internet addiction (Kim et al., 2008; Mehroof & Griffiths, 2010), there has been no examination linking these two groups of studies. Thus, the result of this study provided the theoretical linkage between sports participation and Internet addiction through self-control. In addition, the results also emphasize the importance of employing sports

in Internet addiction treatment programs. Most Internet addiction treatment programs are mainly based on intervention strategies, which are used for substance addiction (Weinstein & Lejoyeux, 2010).

Previous studies suggested that counseling programs and cognitive behavior therapy can be applied to Internet addiction treatment (Hall & Parsons, 2001; Kalke & Raschke, 2004; Shek, Tang, & Lo, 2009; Young, 2007). Young (1998) suggested a more detailed treatment guide for Internet addiction such as practicing for the equivalent time of Internet use, external stoppers, setting goals,

Table 4
Summary of final structural model

Predictor	Direct effects		Indirect effects			
	b	b*	b	b*	95% CI	
					LL	UL
Sport participation → Self-control	.102*	.154				
Self-control → Internet addiction	−.143*	−.142				
Sport participation → Internet addiction			−.015**	−.022	−.035	−.003

Note. Bootstrapping sample size = 500. CI = confidence interval, LL = lower limit, UL = upper limit. **$p < .01$, *$p < .05$, b = unstandardized regression weight, b* = standardized regression weight

abstinence, reminder cards, personal inventory, support groups, and family therapy. On the other hand, a pharmacological treatment was also regarded as one of the possible treatments for Internet addiction (Han et al., 2009). Through the 8 weeks of pharmacological treatment, the level of Internet use was significantly reduced in a group of 62 Korean children having Internet game addiction. However, "it is currently impossible to recommend any evidence-based treatment of Internet addiction" (Weinstein & Lejoyeux, 2010, p. 281). Moreover, the use of pharmacological treatment has potential disadvantages such as a recurrence of the problem and the high cost of medication. Therefore, the need to establish more effective and practical Internet addiction treatment programs is emphasized.

Based on the results of this study, sports and physical exercise programs can be combined with existing intervention strategies or pharmacological treatment for Internet addiction. Especially for adolescents, the physical education class in school can be used to prevent and lessen Internet addiction by modifying and adopting self-control development programs. For example, individual sports requiring a high level of performance are more effective than team sports to develop self-control, and coaches or teachers need to provide sufficient support and feedback to gain maximize benefit (Jonker et al., 2010; Pintrich & Zusho, 2002; Van de Wiel, Szegedi, & Weggeman, 2004; Williams, Donovan, & Dodge, 2000). Moreover, dealing with Internet addiction through sports participation has a lot of additional psychological and physical benefits such as decreasing anxiety, depression, and stress (Hassmén et al., 2000; Salmon, 2001; Scully et al., 1998; Warburton et al., 2006).

Conclusion

This study found a significant effect of sports participation on Internet addiction mediated by self-control. The results identified the effectiveness of and need for sport and physical exercise in Internet addiction treatment programs and for other addictions as well. In addition, sports participation has a wider variety of psychological and physical benefits unlike an intervention strategy or pharmacological treatment. The importance of sport is emphasized and the adoption of sport needs to be broadened from physical development to treating diverse psychological problems in adolescents in school.

Limitations

The limitations of the study included geography, sex, and sampling methods. The participants for this study were selected from two high schools in South Korea and as such, could possibly limit the study results compared to a full population survey of all Korean high school students. Furthermore, with approximately 83% of the respondents being female, a high percentage of girls in the study is also a limitation; a more equal representation of males and females would be ideal. Finally, the sampling method of convenience presents limitations. Two high schools were selected, and as such, cannot necessarily be generalized to the entire South Korean high school population.

Future Research

This study highlights some interesting findings, but it also opens the door to further research opportunities. For example, what is it about sport that helps adolescents enhance and gain self-control? Leadership, excellence, teamwork, and discipline are all highly-prized values in sports. Can these values be generalized to a direct link with self-control? It would also be interesting to look at Internet addiction through the lens of a chemical addiction professional. As more youths are exposed to technology at younger ages, the propensity for Internet addiction has the potential to rise, and as such, the world will be faced with the task of interrupting the cycle of addiction.

Conflict of interest

There is no conflict of interest.

References

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411—423.

Baumeister, R. F. (2003). Ego depletion and self-regulation failure: A resource model of self-control. *Alcoholism: Clinical and Experimental Research, 27*(2), 281—284.

Becker, G. S., Grossman, M., & Murphy, K. M. (1994). An empirical analysis of cigarette addiction. *The American Economic Review, 84*(3), 396—418.

Cha, E. J. (2012). A study on factors influencing middle school students' cyber delinquency. *Journal of Adolescent Welfare, 14*(3), 1—27.

Chapman, D. A. (1998). Habit formation and aggregate consumption. *Econometrica, 66*(5), 1223—1230.

Cho, M., Kwon, W. D., & Jeon, Y. B. (2010). Are Korean secondary school girls physically active during leisure time? *Health Care for Women International, 31*(3), 244—257.

Churchill, G. A., Jr. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 64—73.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River, NJ: Pearson.

Hall, A. S., & Parsons, J. (2001). Internet addiction: College student case study using best practices in cognitive behavior therapy. *Journal of Mental Health Counseling, 23*(4), 312—327.

Han, D., Lee, Y., Na, C., Ahn, J., Chung, U., Daniels, M., et al. (2009). The effect of methylphenidate on Internet video game play in children with attention-deficit/hyper activity disorder. *Comprehensive Psychiatry, 50*(3), 251—256.

Hassmén, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: A population study in Finland. *Preventive Medicine, 30*(1), 17—25.

Jonker, L., Elferink-Gemser, M. T., Toering, T. T., Lyons, J., & Visscher, C. (2010). Academic performance and self-regulatory skills in elite youth soccer players. *Journal of Sports Sciences, 28*(14), 1605—1614.

Jonker, L., Elferink-Gemser, M., & Visscher, C. (2011). The role of self-regulatory skills in sport and academic performances of elite youth athletes. *Talent Development & Excellence, 3*(2), 263—275.

Kalke, J., & Raschke, P. (2004). Learning by doing: 'Initiated abstinence', a school based programme for the prevention of addiction. Results of an evaluation study. *European Addict Research, 10*(2), 88—94.

Kendall, P. C., & Wilcox, L. E. (1979). Self-control in children: Development of a rating scale. *Journal of Consulting and Clinical Psychology, 47*(6), 1020—1029.

Kim, Y. S., & Im, J. I. (2013). An effect of the participation in sport activity of adolescents on the Internet addiction. *Youth Culture Publishers Forum, 37*, 115—140.

Kim, E. J., Namkoong, K., Ku, T., & Kim, S. J. (2008). The relationship between online game addiction and aggression, self-control and narcissistic personality traits. *European Psychiatry, 23*(3), 212—218.

Korea Agency for Digital Opportunity and Promotion. (2003). *The scale for Internet addiction self-diagnosis (K-scale) and preventive education program*. Seoul, South Korea: Author.

Mehroof, M., & Griffiths, M. D. (2010). Online Gaming Addiction: The role of sensation seeking, self-control, neuroticism, aggression, state anxiety, and trait anxiety. *Cyber Psychology and Behavior, 13*(3), 313—317.

Nunnally, J. C. (1978). *Psychometrictheory* (2nd ed.). New York, NY: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3nd ed.). New York, NY: McGraw-Hill.

Oaten, M., & Cheng, K. (2006). Longitudinal gains in self-regulation from regular physical exercise. *British Journal of Health Psychology, 11*(4), 717—733.

Oh, K. S. (2010). Small diagnostic scale for Internet addiction. *Journal of the Korean Data and Information Science Society, 21*(6), 1203—1209.

O'Donoghue, T., & Rabin, M. (1999). Doing it now or later. *American Economic Review, 89*(1), 103—124.

Pintrich, P. R., & Zusho, A. (2002). The development of academic self-regulation: The role of cognitive and motivational factors. In A. Wigfield, & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 249—284). San Diego, CA: Academic Press.

Salmon, P. (2001). Effects of physical exercise on anxiety, depression, and sensitivity to stress: A unifying theory. *Clinical Psychology Review, 21*(1), 33—61.

Scully, D., Kremer, J., Meade, M. M., Graham, R., & Dudgeon, K. (1998). Physical exercise and psychological well being: A critical review. *British Journal of Sports Medicine, 32*(2), 111—120.

Shek, D. T., Tang, V. M., & Lo, C. Y. (2009). Evaluation of an Internet addiction treatment program for Chinese adolescents in Hong Kong. *Adolescence, 44*(174), 359—373.

Song, W. Y. (1998). *Effects of self-efficacy and self-control on the addictive use of internet* (Unpublished master's thesis). Yonsei University, Seoul.

Trimmel, M., & Kopke, E. (2000). Motivations to control drinking behavior in abstainers, moderate, and heavy drinkers. *Pharmacology Biochemistry and Behavior, 66*(1), 169—174.

Van de Wiel, M. W. J., Szegedi, K. H. P., & Weggeman, M. C. D. P. (2004). Professional learning: Deliberate attempts at developing expertise. In H. P. A. Boshuizen, R. Bromme, & H. Gruber (Eds.), *Innovation and change in professional education. Professional learning: Gaps and transitions on the way from novice to expert* (pp. 181—206). Dordrecht, The Netherlands: Kluwer Academic.

Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal, 174*(6), 801—809.

Weinstein, A., & Lejoyeux, M. (2010). Internet addiction or excessive Internet use. *The American Journal of Drug and Alcohol Abuse, 36*(5), 277—283.

Williams, K. J., Donovan, J. J., & Dodge, T. L. (2000). Self-regulation of performance: Goal establishment and goal revision process in athletes. *Human Performance, 13*(2), 159—180.

Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyber Psychology & Behavior, 1*(3), 237—244.

Young, K. S. (2007). Cognitive behavior therapy with Internet addicts: Treatment outcomes and implications. *Cyber Psychology & Behavior, 10*(5), 671—679.

Young, K. S., & Rogers, R. C. (1998). The relationship between depression and Internet addiction. *Cyber Psychology & Behavior, 1*(1), 25—28.

Zhao, X., Lynch, J. G., Jr., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197—206.