Int J Ment Health Addiction (2019) 17:806–816
https://doi.org/10.1007/s11469-018-9871-2

ORIGINAL ARTICLE

The Effects of Personal Susceptibility and Social Support on Internet Addiction: an Application of Adler's Theory of Individual Psychology

Kit-Aun Tan[1]

Published online: 8 January 2018

Abstract The aim of the present study was to examine the addictive effects of personal susceptibility and social support from family, friends, and significant other on Internet addiction. In this study, 207 medical students completed the UCLA Loneliness Scale, the Academic Expectations Stress Inventory, the Multidimensional Scale of Perceived Social Support, and the Young's Diagnostic Questionnaire for Internet addiction. Participants were recruited via simple random sampling technique. Personal susceptibility variables such as loneliness, academic stress due to other expectations, and academic stress due to self-expectations were significantly positively correlated to, and all domains of social support were significantly negatively correlated to, Internet addiction. After adjusting for demographic variables, social support emerged as a significant predictor of Internet addiction in the hierarchical regression analysis. In support of Adler's individual psychology theory, the present findings suggest that social support from family is a valuable adjunct to prevention and intervention programs aimed at alleviating Internet addiction in medical students.

Keywords Internet addiction · Loneliness · Academic stress · Social support

The Internet represents a new modality for social activities (Ling et al. 2011; Young 2004). With its ease of anonymity, individuals feel more comfortable to chat online over offline (Young 1998). Excessive use of Internet has resulted in psychological and behavioral dependencies such as Internet addiction, depression, and mood alteration (Byun et al. 2009; Caplan 2002; Odaci and Kalkan 2010; Widyanto and Griffiths 2006; Yadav et al. 2013). The focus of the present study is Internet addiction.

Just like Internet gaming disorder, the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM-5; American Psychiatric Association 2013) has yet to include

✉ Kit-Aun Tan
tanka@upm.edu.my

[1] Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor Darul Ehsan, Malaysia

Internet addiction as a formal disorder, suggesting a timely need to determine whether Internet addiction should be added to the manual as a disorder. Diagnostic features pertaining to Internet gaming disorder are expected to hold true for Internet addiction. Following this line of inquiry, Young (1998) defined Internet addiction as a form of online-related, compulsive behavior which could have consequences on daily life functioning. The eight-item Young's Diagnostic Questionnaire (YDQ) for Internet addiction is designed to facilitate the assessment of such online behavior (for a review, see Young 1996). For the YDQ, a cutoff score of 5 is suggestive of Internet addiction. With respect to university student population, the worldwide prevalence rates of Internet addiction have ranged from 2.5% in Malaysia (Zainudin et al. 2013) to 9.8% in the USA (Anderson 2001) and to 18.3% in the Great Britain (Niemz et al. 2005). As with global prevalence estimates of Internet addiction, the Middle East had the highest prevalence, whereas Northern and Western Europe had the lowest prevalence (Cheng and Li 2014). Meta-analytic findings also reported that higher Internet addiction prevalence was associated with low life satisfaction and poor environmental quality (Cheng and Li 2014). Indeed, extant research has shown how personal susceptibility and contextual factors can lead to Internet addiction (e.g., Nalwa and Anand 2003; Shapira et al. 2000).

Adler's Theory of Individual Psychology

Although voluminous studies have examined Internet addiction, few studies have employed established theories to explain Internet addiction. In an attempt to explain the development of Internet addiction, the present study employed Adler's Theory of Individual Psychology as a theoretical framework in that it constitutes aninsightful tool for understanding Internet addiction—Internet use could present a means for individuals to achieve superiority or dominance (Bloom and Taylor 2015; Sachau 2004). Three important interrelated Adlerian concepts that have surfaced include *style of life* or *lifestyle*, *inferiority complex*, and *social interest*. First, *style of life* or *lifestyle* is individuals' subjective summary of attitudes and reactions about life and reality and has its root in family atmosphere (Peluso et al. 2004; Watkins 1984). In pursuit of basic and emotional needs, individuals use such subjective summary to make decisions or strategies to stay in a social group (Peluso et al. 2004). Second, *inferiority complex* is a psychodynamic process by which individuals do not only develop self-esteem but also shape lifestyle (Whiteman et al. 2011). When presented with disappointment, individuals constantly seek compensation in exchange for positive self-esteem. Negative compensatory strategies can pose a threat to lifestyle. Third, *social interest* reflects individuals' innate capacity to fulfill a sense of belonging and is developed from and reinforced by family atmosphere (Peluso et al. 2004). High social interest has been shown to predict self-acceptance and productivity, whereas low social interest has been shown to predict stress and anxiety (Peluso et al. 2004).

Personal Susceptibility

In this study, loneliness is one of two personal susceptibility variables of Internet addiction, the other being academic stress. The present study selected these variables for two important reasons. First, *loneliness* reflects one's perception towards social contact (Forbes 1996). Low social activities are reflective of loneliness (Jin 2013). The 5-year professional socialization of medical students takes place in a demanding environment. Due to lack of time for socializing, there is relatively high

prevalence of loneliness in medical students (Edwards and Zimet 1976; Lou 2009). Compared with the other health sciences students, medical students reportedly showed higher levels of loneliness and helplessness (Bjorksten et al. 1983). It is possible that individuals would use virtual social network over face-to-face communication to compensate low social activities (Bozoglan et al. 2013; Eroglu et al. 2013). Second, strong attempts to pursue academic excellence and to meet self and other expectations could result to *academic stress* (Tan and Yates 2011). To this end, two stressors emerged: academic stress due to parent or teacher expectations (henceforth referred to as other expectations) and academic stress due to self-expectations (Ang and Huan 2006). As a by-product of expectations and self-expectations, Asian adolescents tend to report more pressure to succeed academically than do Western adolescents (Ang et al. 2009). Despite cross-cultural effect, students' unmet academic expectations and demands from self and others could serve as a risk factor for Internet addiction (Huang et al. 2010). Taken together, loneliness and academic stress can be regarded as manifestations of high inferiority complex and low social interest in that individuals seek Internet surfing as a compensatory strategy to channel their loneliness and academic stress. Such compensatory strategy could lead to maladjustment. It is thus reasonable to infer a positive link between personal susceptibility variables and Internet addiction.

Multiple Domains of Social Support

Social support reflects one's dependency and relatedness towards others in time of need and is loaded in the broad ecological domains of family, friends, and significant other (Cohen and Syme 1985). Connectedness to these contextual domains linked to emergence of social interest and lifestyle. In one study, Yang et al. (2014) reported that connectedness to family and significant other decreased the odds of substance abuse and violent behavior, whereas connectedness to friends increased the odds of violent behavior. To date, there is limited research that has *simultaneously* examined the relation between multiple domains of social support and Internet addiction. Due to low socialinterest, one major concept of Adler's individual psychology, individuals would unintentionally seek compensation from the Internet as asubstitute for social and emotional support (Jessor et al. 2003). This can help lay the foundation for the greater incidence of Internet dependency (Shaw and Gant 2002; Yeh et al. 2008).

Control Variables

Control variables are included in the present study to account for the effects of additional variables that may influence Internet addiction. They include age and gender. Internet addiction tends to be higher for males and for those who are elder (e.g., Kaltiala-Heino et al. 2004; Widyanto and McMurran 2004).

The Present Study

The study of interconnections between personal susceptibility, social support, and Internet addiction draws upon Adler's individual psychology theory. In the presence of inferiority complex, individuals would drive to seek compensation, a psychodynamic mechanism that hinders frustration (Whiteman et al. 2011). In support of Adler's premise, Internet surfing could

offer individuals a social platform for compensating loneliness, academic stress, and social support. This preliminary study aims to address two research gaps by examining whether personal susceptibility and multiple domains of social support are predictive of Internet addiction in a sample of medical students. First, there is a dearth of published data evaluating Internet addiction in medical students. The present study targeted medical students for one important reason. It appears that medical students reportedly showed higher levels of academic stress and loneliness and lower levels of social support compared to students from other programs (Bjorksten et al. 1983). Second, while researchers have paid increasing attention to the relationship between isolated domains of social support and Internet addiction, the emphasis has largely neglected studying this relationship with a focus on multiple domains of social support.

The aim of the present study was to examine the addictive effects of personal susceptibility and social support from family, friends, and significant other on Internet addiction in a sample of medical students. Based on the research findings reviewed thus far, it is hypothesized that personal susceptibility variables would account for a significant amount of variance in Internet addiction over and above that accounted for by age and gender; it is also hypothesized that multiple domains of social support would account for a significant amount of variance in Internet addiction over and above that accounted for by age, gender, and personal susceptibility variables.

Methods

Participants

Two hundred seven undergraduate students (30% male and 70% female) enrolled in medical program at Universiti Putra Malaysia (UPM) participated in this cross-sectional study in exchange for course credit. Participants' age ranged from 19 to 24 years old ($M = 21.01$, $SD = 1.09$). Self-reported ethnic identification for the present study was 66.2% Malay, 21.7% Chinese, 10.1% Indian, and 1.9% endorsed Others. Using G-Power, a post hoc power analysis was performed (Erdfelder et al. 1996). A power of .80 would serve as a cutoff threshold (Peytchev and Hill 2010). The present sample size of 207 was used for the statistical power analysis and an eight-predictor variable equation was used as a baseline. The post hoc analyses revealed that the statistical power for this study was .97. It was adequate to detect an effect size of f^2 .13.

Procedure

The present study included only medical students. As part of the undergraduate medical program, Faculty of Medicine and Health Sciences, UPM offers opportunities for its medical students to become involved in research as study participants. Participants were randomly recruited online from the pool of undergraduate medical students and received course credit for their participation. After informed consent had been sought, participants were invited to complete a self-administered web-based questionnaire.

Consent

Prior to data collection, the present study sought ethical clearance from the Ethics Committee for Research Involving Human Subjects, UPM. Permission and approval from the participating faculty were also obtained. Participation was strictly voluntary.

Measures

Loneliness

The UCLA Loneliness Scale (UCLA LS; Russell 1996) is a 20-item self-report measure of loneliness. Participants rated items on a 4-point Likert scale ranging from 1 (*never*) through 4 (*always*). Cronbach's alpha estimate for the UCLA LS in this present study was .79, although Cronbach's alpha of .89 has been obtained with a sample of Malaysian undergraduates (Mansor et al. 2014).

Academic Stress

The Academic Expectations Stress Inventory (AESI; Ang and Huan 2006) is a nine-item self-report measure of academic stress. Participants rated items on a 5-point Likert scale ranging from 1 (*never true*) through 5 (*almost always true*). The AESI has two subscales: Academic Stress due to Parent or Teacher Expectations (AESI Others) and Academic Stress due to Self-Expectations (AESI Self). Good subscale internal consistency evidence has been reported (Cronbach's alpha estimates ranged from .81 to .84; Ang et al. 2009). Cronbach's alpha estimates for the present study were as follows: AESI Others (.88) and AESI Self (.86).

Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al. 1988) is a 12-item self-report measure of perceived social support. Participants rated items on 7-point Likert scale ranging from 1 (*very strongly disagree*) and 7 (*very strongly agree*). The MSPSS has three subscales: Social Support from Family (MSPSS Family), Social Support from Friends (MSPSS Friends), and Social Support from Significant Other (MSPSS Significant Other). In past research, Cronbach's alphas for the subscales ranged from .89 to .92 (Friedlander et al. 2007). Cronbach's alpha estimates for the present study were as follows: MSPSS Family (.94), MSPSS Friends (.91), and MSPSS Significant Other (.94).

Internet Addiction

The eight-item YDQ for Internet addiction is a self-report measure of Internet addiction. Participants rated yes-or-no items. Higher score indicates greater Internet addiction. In past research about the YDQ, the Cronbach's alpha was .71 (Johansson and Götestam 2004). Cronbach's alpha estimate for the YDQ in this present study was .70.

Data Analytic Plan

In the present study, univariate analyses were performed first, followed by bivariate analyses, and then multivariate analyses. For descriptive analyses, means, standard deviations, skewness, and kurtoses were calculated for demographic and research variables. Normality might become a concern when skewness indices exceed 3 and when kurtosis indices exceed 10 (Kline 2010). For bivariate analyses, zero-order correlations were conducted to examine demographic and personal susceptibility variables in relation to Internet addiction. All Pearson's *r*s were then transformed to Cohen's *d*s using an effect size calculator (Ellis 2009)

in that it has now become standard statistical practice to report effect sizes (Wilkinson and APA Task Force on Statistical Inference 1999). Effect sizes, as suggested by Cohen (1988), are defined as small ($d = 0.20$), medium ($d = 0.50$), and large ($d = 0.80$). For multivariate analyses, a three-step hierarchical multiple regression analysis was performed in an attempt to examine whether social support variables would improve the prediction of Internet addiction beyond that provided by demographic and personal susceptibility variables. Following Brenner et al.'s (1995) proximal-distal approach, control variables (i.e., age and gender) were entered in step 1. Personal susceptibility variables as indicated by loneliness and academic stress variables were entered in step 2. In step 3, social support variables were entered. Age and gender served as control variables because they might have significant influence on Internet addiction (e.g., Kaltiala-Heino et al. 2004; Widyanto and McMurran 2004).

Results

Univariate Statistics

Table 1 presents descriptive statistics and zero-order correlations for the variables in the analysis. No significant departures from normality were noted as both skewness and kurtosis indexes were in the acceptable range (Kline 2010). Using a cutoff score of 5, as recommended by Young (1996), the prevalence rate of Internet addiction in the present sample was 31.9%.

Zero-Order Correlations Among Study Variables

With respect to personal susceptibility variables, loneliness ($r = .21$, $p < .01$, Cohen's $d = 0.43$), academic stress due to parent or teacher expectations ($r = .37$, $p < .05$, Cohen's $d = 0.80$), and academic stress due to self-expectations ($r = .38$, $p < .01$, Cohen's $d = 0.82$) were significantly

Table 1 Univariate statistics and zero-order correlations among study variables

Variable	1	2	3	4	5	6	7	8	9
1 Age									
2 Gender	−.10								
3 Loneliness	.25**	−.26**							
4 AESI Others	.30**	−.08	.37**						
5 AESI Self	.34**	−.04	.38**	.75**					
6 MSPSS Family	−.34**	.20**	−.42**	−.11	−.15*				
7 MSPSS Friends	−.15*	.20**	−.62**	−.15*	−.12	.66**			
8 MSPSS Significant Other	−.23**	.13	−.47**	−.28**	−.24**	.56**	.63**		
9 Internet Addiction	.20**	−.19**	.21**	.16*	.20**	−.25**	−.14*	−.18**	
M	21.01	1.70	44.08	14.00	11.95	21.08	19.69	19.57	3.65
SD	1.09	0.50	8.58	4.78	3.59	4.76	4.83	5.32	2.10
Kurtosis	0.66	0.88	0.05	0.13	0.19	0.84	0.74	0.61	0.12
Skewness	0.12	1.23	0.06	0.65	0.24	0.43	0.38	0.13	0.54

Note. AESI = Academic Expectations Stress Inventory, MSPSS = Multidimensional Scale of Perceived Social Support

*$p < .05$

**$p < .01$

positively correlated to Internet addiction. With respect to social support variables, social support from family ($r = -.42$, $p < .05$, Cohen's $d = 0.93$), social support from friends ($r = -.62$, $p < .05$, Cohen's $d = 1.60$), and social support from significant other ($r = -.47$, $p < .05$, Cohen's $d = 1.07$) were significantly negatively correlated to Internet addiction. Cohen's d ranged from 0.43 to 1.60, suggesting quite a wide variability of effect sizes that stretch from approximately small to large.

Predicting Internet Addiction

In step 1, age ($\beta = .18$, $p = .01$) and gender ($\beta = -.17$, $p = .02$) contributed significantly to the prediction of Internet addiction, $R^2 = .07$, F (2, 204) = 7.40, $p = .05$. In step 2, only gender emerged as a significant predictor ($\beta = -.14$, $p = .03$). In step 3, addition of social support variables made a significant contribution to the prediction of Internet addiction, $R^2 = .12$, F (8,198) = 3.37, $p = .05$, accounting for 12% of the variance in Internet addiction. Of the three domains pertaining to social support, only social support from family ($\beta = -.20$, $p = .05$) significantly predicted Internet addiction (Table 2).

Discussion

The present study examined the role of personal susceptibility and social support on Internet addiction. With the application of Adler's individual psychology theory, the present findings add substantially to our understanding vis-à-vis relative contribution of loneliness, academic

Table 2 Hierarchical multiple regression analysis for prediction of Internet addiction from personal susceptibility and social support

Variable	R^2	ΔR^2	β	Tolerance	VIF
Step 1	.07	.07			
Age			.18*	.99	1.01
Gender			−.17*	.99	1.01
Step 2	.10	.01			
Age			.12	.86	1.16
Gender			−.14*	.92	1.08
Loneliness			.10	.77	1.30
AESI Others			.03	.43	2.33
AESI Self			.15	.42	2.41
Step 3	.12	.02			
Age			.07	.78	1.29
Gender			−.13	.91	1.09
Loneliness			.09	.50	2.02
AESI Others			.02	.42	2.40
AESI Self			.13	.41	2.45
Social support from family			−.20*	.47	2.11
Social support from friends			−.13	.35	2.82
Social support from significant other			−.05	.53	1.89

Note. $N = 207$; gender (male = 1, female = 2). AESI Others = academic stress due to parent or teacher expectations, AESI Self = academic stress due to self-expectations. Across all regressions, variance inflation factor (VIF) values were at most 2.82 and tolerance values were at least .35. There was no violation of multicollinearity assumption (Cohen et al. 2003)

*$p < .05$

stress, and social support on Internet addiction in a sample of medical students. In the present study, the prevalence rate of Internet addiction was 31.9%, which is comparable to Zainudin et al. (2013) and Anderson (2001). One possible explanation for this discrepancy relates to assessment tools such as Internet Addiction Test (Zainudin et al. 2013) and self-developed scale (Anderson 2001). Where the need for future meta-analytic work is paramount, the use of a standardized assessment tool for Internet addiction is recommended.

At the bivariate level, all personal susceptibility variables were significantly positively correlated to, and all domains of social support were significantly negatively correlated to, Internet addiction. For loneliness, this result is in line with previous research by Bozoglan et al. (2013). Feelings of loneliness could be counterbalanced by online interactions (Eroglu et al. 2013; Jin 2013; Odaci and Kalkan 2010). Online interactions via social networks do not necessarily lead to Internet addiction. The Internet can help individuals making friends outside their physical social circle for social interactions (Ang et al. 2015). For academic stress, consistent with Adler's theory in documenting that high self-expectations and other expectations could result low social interest. The present study corroborates previous findings that academic stress was correlated with Internet addiction (Huang et al. 2010). For social support, the present findings highlight the need for individuals to create and to fulfill a sense of connectedness to family, friends, and significant other in preventing online maladaptive behavior. Multivariate analyses revealed that only social support from family significantly predicted Internet addiction, suggesting a need to alleviate Internet addiction with a focus on family domain. The present study lends credence to Adler's notion that family atmosphere is central to the development of lifestyle and social interest. If individuals do not receive emotional and instrumental support from family atmosphere that they need, it is possible for them to compensate by developing more extensive online social interactions and excessive use of Internet. Children's risk of developing addictive behaviors could be reduced by educating parents to use common topics occurring in their daily lives to teach children skills on problem solving in an attempt to promote lifestyle and social interest (Sanders 1999).

The present findings presented here have implications for prevention and intervention of Internet addiction in at least three ways. First, social skills training can offer a repertoire of interpersonal relationship skills to individuals from which they learn how to expand life circle for social interactions (Halvorson 2010). Second, mindfulness-based stress reduction (MBSR), a stress management program, can help medical students to cope emotional disturbance arising from expectations of self and of others (Bishop et al. 2004). Third, the present study provides vital insight into the role of family in the provision of social support. As part of parental monitoring and family communication, parents could serve as an advocator in promoting cyber-wellness by educating children on etiquette and issues concerning Internet use (Livingstone and Helsper 2008).

A few limitations warrant comment. First, due to the focus of the present study, students from other academic programs were not recruited. This raises a critical issue concerning generalizability. Greater generalizability could be achieved by recruiting undergraduate students from various disciplines in future studies. Second, some interactive and addictive psychosocial correlates such as family status (Frangos et al. 2010) and presence of depression (Sinha 2007; Witkiewitz and Villarroel 2009) were omitted in the present study. Inclusion of these variables in future studies could better enrich our scientific understanding towards Internet addiction. Third, this is a cross-sectional study thus no statistical inference pertaining to causality could be made. The Internet may serve as a new social milieu for adolescents to seek support that they may not have in face-to-face interaction. A longitudinal study would help to shed light on the directionality of study variables. Last but not least, sole reliance on

self-reports might pose social desirability, an avoidance strategy by participants providing only favorable responses. In this regard, parent-or-peer reports could be used as a source of informant in future studies.

To conclude, the present study contributes to the limited but growing body of research on Internet addiction in examining the role of loneliness, academic stress, and social support in the prediction of Internet addiction in a sample of medical students. Few if any studies have simultaneously examined the associations between multiple domains of social support and Internet addiction using a medical sample. The present study's findings suggest that social support from family is a valuable adjunct to prevention and intervention programs aimed at alleviating Internet addiction in medical students.

Acknowledgements The author is grateful to Mohd Saifullah Mohd Arif Kor, Nur Amalina Tukiman, and Nurul Amyrah Che Ahmad Kamily for their help with data collection; Nor Sheereen Zulkefly, Normala Ibrahim, Firdaus Mukhtar, and Sherina Mohd Sidik for their comments on an earlier draft of this article.

Funding Information No funding was obtained for this study.

Compliance with Ethical Standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of Interest The author declares that there are no conflicts of interest.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anderson, K. J. (2001). Internet use among college students: an exploratory study. *Journal of American College Health, 50*(1), 21–26.

Ang, R. P., & Huan, V. S. (2006). Academic expectations stress inventory development, factor analysis, reliability, and validity. *Educational and Psychological Measurement, 66*(3), 522–539.

Ang, R. P., Klassen, R. M., Chong, W. H., Huan, V. S., Wong, Y. F., Yeo, L. S., & Krawchuk, L. L. (2009). Cross-cultural invariance of the Academic Expectations Stress Inventory: adolescents samples from Canada and Singapore. *Journal of Adolescence, 32*, 1225–1237.

Ang, C. S., Talib, M. A., Tan, K. A., Tan, J. P., & Yaacob, S. N. (2015). Understanding computer-mediated communication attributes and life satisfaction from the perspectives of uses and gratifications and self-determination. *Computers in Human Behavior, 49*, 20–29.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., & Devins, G. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241.

Bjorksten, O., Sutherland, S., Miller, C., & Stewart, T. (1983). Identification of medical student problems and comparison with those of other students. *Journal of Medical Education, 58*, 759–767.

Bloom, Z. D., & Taylor, D. D. (2015). New problems in today's technological era: an Adlerian case example. *Journal of Individual Psychology, 71*, 163–173.

Bozoglan, B., Demirer, V., & Sahin, I. (2013). Loneliness, self-esteem, and life satisfaction as predictors of Internet addiction: a cross-sectional study among Turkish university students. *Scandinavian Journal of Psychology, 54*, 313–319.

Brenner, M. H., Curbow, B., & Legro, M. W. (1995). The proximal-distal continuum of multiple health outcome measures: the case of cataract surgery. *Medical Care, 33*(4), 236–244.

Byun, S., Ruffini, C., Mills, J. E., Douglas, A. C., Niang, M., Stepchenkova, S., & Blanton, M. (2009). Internet addiction: metasynthesis of 1996–2006 quantitative research. *CyberPsychology and Behavior, 12*(2), 203–207.

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive-behavioral measurement instrument. *Computers in Human Behavior, 18*(5), 553–575.

Cheng, C., & Li, A. Y. (2014). Internet addiction prevalence and quality of (real) life: a meta-analysis of 31 nations across seven world regions. *Cyberpsychology, Behavior, and Social Networking, 17*(12), 755–760.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: Erlbaum.

Cohen, S., & Syme, S. L. (1985). Issues in the study and application of social support. *Social Support and Health, 3*, 3–22.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah: Lawrence Erlbaum.

Edwards, M. T., & Zimet, C. N. (1976). Problems and concerns among medical students—1975. *Journal of Medical Education, 51*, 619–625.

Ellis, P. D. (2009). Effect size calculators. Retrieved from http://myweb.polyu.edu.hk/~mspaul/calculator/calculator.html

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: a general power analysis program. *Behavior Research Methods, Instruments, and Computers, 28*(1), 1–11.

Eroglu, M., Pamuk, M., & Pamuk, K. (2013). Investigation of problematic Internet usage of university students with psychosocial levels at different levels. *Procedia-Social and Behavioral Sciences, 103*, 551–557.

Forbes, A. (1996). Loneliness. *British Medical Journal, 313*, 352–354.

Frangos, C., Frangos, C., & Kiohos, A. (2010). Internet addiction among Greek university students: demographic associations with the phenomenon, using the Greek version of Young's Internet addiction. *International Journal of Economic Sciences and Applied Research, 1*, 49–74.

Friedlander, L. J., Reid, G. J., Shupak, N., & Cribbie, R. (2007). Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates. *Journal of College Student Development, 48*(3), 259–274.

Halvorson, H. (2010). The cure for loneliness. The Science of Success. Retrieved July 14, 2014, from http://www.psychologytoday.com/blog/the-science-success/201010/the-cure-loneliness.

Huang, X., Zhang, H., Li, M., Wang, J., Zhang, Y., & Tao, R. (2010). Mental health, personality, and parental rearing styles of adolescents with Internet addiction disorder. *CyberPsychology Behavior and Social Networking, 13*(4), 401–406.

Jessor, R., Turbin, M. S., Costa, F. M., Dong, Q., Zhang, H., & Wang, C. (2003). Adolescent problem behavior in China and the United States: a cross-national study of psychosocial protective factors. *Journal of Research on Adolescence, 13*(3), 329–360.

Jin, B. (2013). How lonely people use and perceive Facebook. *Computers in Human Behavior, 29*, 2463–2470.

Johansson, A., & Götestam, K. G. (2004). Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12–18 years). *Scandinavian Journal of Psychology, 45*, 223–229.

Kaltiala-Heino, R., Lintonen, T., & Rimpela, A. (2004). Internet addiction? Potentially problematic use of the Internet in a population of 12–18 year-old adolescents. *Addiction Research and Theory, 12*, 89–96.

Kline, R. B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

Ling, C. S., Ramadass, S., Altaher, A. & Arjuman, N.C. (2011). Malaysian Internet Surfing Addiction (MISA): factors affecting the internet use and its consequences. In Computer Applications and Industrial Electronics (ICCAIE), 2011 I.E. International Conference on (pp. 585–590). IEEE.

Livingstone, S., & Helsper, E. J. (2008). Parental mediation of children's Internet use. *Journal of Broadcasting and Electronic Media, 52*(4), 581–599.

Lou, L. L. (2009). *Loneliness, friendship, and self-esteem: first-year college students' experience of using Facebook*. Albany: UMI Dissertation Publishing.

Mansor, A. T., Ang, C. S., & Tan, K. A. (2014). Pangs of loneliness breed material lifestyle but don't power up life satisfaction of young people: the moderating effect of gender. *Social Indicators Research, 117*(2), 353–365.

Nalwa, K., & Anand, A. P. (2003). Internet addiction in students: a cause of concern. *CyberPsychology and Behavior, 6*(6), 653–656.

Niemz, K., Griffiths, M., & Banyard, P. (2005). Prevalence of pathological Internet use among university students and correlations with self-esteem, the General Health Questionnaire (GHQ), and disinhibition. *CyberPsychology and Behavior, 8*(6), 562–570.

Odacı, H., & Kalkan, M. (2010). Problematic Internet use, loneliness and dating anxiety among young adult university students. *Computers and Education, 55*(3), 1091–1097.

Peluso, P. R., Peluso, J. P., White, J. F., & Kern, R. M. (2004). A comparison of attachment theory and individual psychology: a review of the literature. *Journal of Counseling and Development, 82*, 139–145.

Peytchev, A., & Hill, C. A. (2010). Experiments in mobile web survey design: similarities to other modes and unique considerations. *Social Science Computer Review, 28*, 319–335.

Russell, D. W. (1996). UCLA Loneliness Scale (version 3): reliability, validity, and factor structure. *Journal of Personality Assessment, 66*(1), 20–40.

Sachau, B. (2004). Individual psychology in the teaching of foreign language and literature: a new approach in foreign language pedagogy and an Adlerian interpretation of selected works by Theodor Storm (Unpublished doctoral dissertation). The Pennsylvania State University.

Sanders, M. R. (1999). Triple P—Positive Parenting Program: towards an empirically validated multilevel parenting and family support strategy for the prevention of behavior and emotional problems in children. *Clinical Child and Family Psychology Review, 2*, 71–90.

Shapira, N. A., Goldsmith, T. D., Keck Jr., P. E., Khosla, U. M., & McElroy, S. L. (2000). Psychiatric features of individuals with problematic Internet use. *Journal of Affective Disorders, 57*(1), 267–272.

Shaw, L. H., & Gant, L. M. (2002). In defense of the Internet: the relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *CyberPsychology and Behavior, 5*(2), 157–171.

Sinha, R. (2007). The role of stress in addiction relapse. *Current Psychiatry Reports, 9*(5), 388–395.

Tan, J. B., & Yates, S. (2011). Academic expectations as sources of stress in Asian students. *Social Psychology of Education, 14*(3), 389–407.

Watkins Jr., C. E. (1984). The individual psychology of Alfred Adler: toward an Adlerian vocational theory. *Journal of Vocational Behavior, 24*, 28–47.

Whiteman, S. D., McHale, S. M., & Soli, A. (2011). Theoretical perspectives on sibling relationships. *Journal of Family Theory and Review, 3*(2), 124–139.

Widyanto, L., & Griffiths, M. (2006). 'Internet addiction': a critical review. *International Journal of Mental Health and Addiction, 4*(1), 31–51.

Widyanto, L., & McMurran, M. (2004). The psychometric properties of the internet addiction test. *CyberPsychology and Behavior, 7*(4), 443–450.

Wilkinson, L., & APA Task Force on Statistical Inference. (1999). Statistical methods in psychology journals. Guidelines and explanations. *American Psychologist, 54*, 594–604.

Witkiewitz, K., & Villarroel, N. A. (2009). Dynamic association between negative affect and alcohol lapses following alcohol treatment. *Journal of Consulting and Clinical Psychology, 77*(4), 633–644.

Yadav, P., Banwari, G., Parmar, C., & Maniar, R. (2013). Internet addiction and its correlates among high school students: a preliminary study from Ahmedabad, India. *Asian Journal of Psychiatry, 6*(6), 500–505.

Yang, F., Tan, K.-A., & Cheng, W. J. Y. (2014). The effects of connectedness on health-promoting and health-compromising behaviors in adolescents: evidence from a statewide survey. *Journal of Primary Prevention, 35*(1), 33–46.

Yeh, Y. C., Ko, H. C., Wu, J. Y. W., & Cheng, C. P. (2008). Gender differences in relationship of actual and virtual social support to Internet addiction mediated through depressive symptoms among college students in Taiwan. *CyberPsychology and Behavior, 11*(4), 485–487.

Young, K. S. (1996). Psychology of computer use: XL. Addictive use of the Internet: a case that breaks the stereotype. *Psychological Reports, 79*(3), 899–902.

Young, K. S. (1998). Internet addiction: the emergence of a new clinical disorder. *CyberPsychology and Behavior, 1*(3), 237–244.

Young, K. S. (2004). Internet addiction a new clinical phenomenon and its consequences. *American Behavioral Scientist, 48*(4), 402–415.

Zainudin, A., Din, M. M., & Othman, M. (2013). CIMP Internet Addiction Guideline. *International Journal of Asian Social Science, 3*(9), 1967–1972.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30–41.