

The Association between Internet Addiction and Belief of Frustration Intolerance: The Gender Difference

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ABSTRACT

This study evaluated the association between Internet addiction and frustration intolerance, the gender difference of frustration intolerance, and the gender differences of the association between Internet addiction and frustration intolerance. Participants were 2,114 students (1,204 male and 910 female) who were recruited to complete the Chen Internet Addiction Scale and Frustration Discomfort scale. Females had higher scores on the subscale of entitlement and emotional intolerance and the total scale of the frustration intolerance. There was a significant gender difference on the association between Internet addiction and frustration intolerance. The association was higher in male adolescents. Regression analysis revealed male adolescents with Internet addiction had higher intolerance to frustration of entitlement and emotional discomfort, and female adolescents with it had higher intolerance to emotional discomfort and lower tolerance to frustration of achievement. Frustration intolerance should be evaluated for adolescents with Internet addiction, especially for males. Rational emotive behavior therapy focusing on different irrational beliefs should be provided to male and female adolescents with Internet addiction.

INTRODUCTION

AS A PERVERSIVE PART of modern life, the Internet has become an important part of the adolescent's life. It brings negative as well as positive influences to adolescents.¹ Maladaptive Internet use has been termed as *Internet addiction* by Young.² A recent study found 19.8% of adolescents had Internet addiction,³ and it was associated with depression, hostility, and substance experience.^{4,5} Thus, it is an important issue of mental health among adolescents.

Until now, there have been no conclusive diagnostic criteria for Internet addiction. Ko et al. have developed diagnostic criteria based on systemic diagnostic interview to identify adolescents with Internet addiction.⁶ The core symptoms in their criteria includes preoccupation, uncontrolled impulse, usage more than intended, tolerance, withdrawal, impairment of control, excessive time and effort spent on the Internet, and impairment of decision-making ability. The diagnostic criteria with good diagnostic accuracy (95.4%) were utilized to define Internet addiction in this study.⁶

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Cognitive behavior therapy has been utilized to effectively treat behavior addiction such as pathological gambling.⁷ From a clinical perspective, effective cognitive behavior therapy depends on whether the cognitions related to the focus problem can be identified. Irrational beliefs are reported by rational emotive behavior therapists (REBT) to be central to emotional and behavior problems. Irrational beliefs may be grouped within two separate categories: the intolerance of frustration/discomfort and the evaluation of self-worth.⁸ Intolerance of frustration represents the demand that reality should be as we wish it to be. It is reported to be associated with problems of self-control.⁹ Adolescents with Internet addiction are usually characterized with low frustration tolerance in clinical investigation. Thus, to evaluate whether adolescents with Internet addiction have intolerance of frustration could provide essential information to determine the focus of REBT for Internet addiction among adolescents.

The Frustration-Discomfort Scale (FDS) was developed by Harrington to measure frustration intolerance beliefs.¹⁰ The scale includes four dimensions: emotional intolerance, discomfort intolerance, entitlement, and achievement. The emotional intolerance subscale demonstrates the belief that emotional distress is unbearable and must quickly be relieved or avoided. The discomfort intolerance subscale reflects beliefs that life should be free of hassles, effort, and inconvenience. Demands for fairness and immediate gratification are included in the entitlement subscale. Lastly, the achievement subscale reflects demands for high standards and intolerance of these standards being frustrated.¹⁰ A previous report revealed that different dimensions of frustration intolerance have differential relationships with specific self-control problems.⁹ Thus, it is necessary to evaluate which dimension of frustration intolerance is associated with Internet addiction and must be abated in REBT for Internet addiction.

Internet addiction has been reported to be more prevalent among male than female adolescents.⁴ Ko has reported that Internet addiction was associated with self-esteem for male, but not for female, students.¹¹ This may indicate there is a gender difference on the mechanism of Internet addiction. However, the gender difference of the frustration intolerance of adolescents and its relationship with Internet addiction has not been evaluated.

Thus, the study aimed to (a) evaluate the association between Internet addiction and

frustration intolerance; (b) explore the gender differences of frustration intolerance; and (c) investigate gender differences in the association between Internet addiction and frustration intolerance.

MATERIAL AND METHOD

Three senior high schools and seven vocational high schools in southern Taiwan were randomly selected in this study. Two classes were randomly selected from each grade. In the selected classes, an informed consent form was provided to each student. Then, participants who signed the form were invited to complete the measurement anonymously. Recruited were 2,114 students (1,204 male, 910 female), and their mean age was 16.26 years ($SD = 0.99$, range 15–23 years). Additionally, this study had been approved by the Institutional Review Board (IRB) of Kaohsiung Medical University Hospital.

Measurement

Chen Internet Addiction Scale (CIAS). The CIAS consists of 26 items, scored on a 4-point Likert scale. The total scores of the CIAS ranged from 26 to 104. Higher CIAS scores indicated increased severity of Internet addiction. In the original study, the internal reliability of the instrument and its subscales ranged from 0.79 to 0.93, and correlation analyses yielded significantly positive correlations of total scale and subscale scores of CIAS with the hours spent weekly on Internet activity.¹² According to the diagnostic criteria of Internet addiction,⁶ the 63/64 cutoff point of CIAS has highest diagnostic accuracy (87.6%), accepted sensitivity (67.8%), and specificity (92.6%).³ Accordingly, those with CIAS scores of 64 or more were classified as the Internet addiction group.

The FDS. The revised FDS,¹⁰ used in the present study, consisted of 28 items with four scores ranging from 28 to 140. The higher score indicated higher frustration intolerance belief. It consisted of four subscales: discomfort intolerance, entitlement, emotional intolerance, and achievement. The Cronbach's alphas were 0.84 to 0.88. The revised subscales showed unique relationships with specific psychological problems and evidence of convergent and divergent validity.⁹ In this presenting study, its Cronbach's alphas of total scale and subscales were 0.78 to 0.93.

TABLE 1. ASSOCIATIONS BETWEEN FOUR DIMENSIONS OF FRUSTRATION-DISCOMFORT SCALE AND GENDER AND INTERNET ADDICTION

	Gender		t	Internet addiction		t
	Male (1,130) Mean \pm SD	Female (862) Mean \pm SD		Yes (N = 364) Mean \pm SD	No (N = 1628) Mean \pm SD	
Discomfort intolerance	20.30 \pm 5.76	20.49 \pm 5.34	-0.74	22.66 \pm 5.80	19.87 \pm 5.41	8.77***
Entitlement	19.37 \pm 5.62	19.91 \pm 5.43	-2.17*	21.98 \pm 5.34	19.07 \pm 5.45	9.34***
Emotional intolerance	19.38 \pm 6.01	20.57 \pm 5.46	-4.61***	21.87 \pm 5.71	19.46 \pm 5.74	7.26***
Achievement	17.55 \pm 5.57	17.37 \pm 5.24	0.73	19.44 \pm 5.71	17.04 \pm 5.26	7.75***
Total scale	76.60 \pm 20.64	78.35 \pm 18.73	-1.97*	85.95 \pm 20.30	75.44 \pm 19.24	9.32***

* $p < 0.05$; *** $p < 0.001$.

Statistical analysis

The participants completing the CIAS and FDS were enrolled in the final analysis. The participants were classified as Internet addiction group according to the CIAS. The associations between the scores of FDS and gender and Internet addiction were evaluated by t test. Then, an analysis of variance by the general linear model procedure was utilized to assess whether the association between scores of CIAS and FDS was influenced by gender. Then, the association between FDS and CIAS was analyzed for male and female respectively. Meanwhile, the associations between CIAS score and subscale of FDS were evaluated with linear multiple regression for male and female respectively. All statistical analyses were performed using the SPSS computer package program. A p value less than 0.05 was considered significant.

RESULTS

The data of 1,992 (94.2%) participants (1,130 boys and 862 girls) were entered into the final statistical analysis. There was no difference on gender between adolescents enrolled and excluded ($\chi^2 = 0.72$, $p = 0.40$). The mean age was 16.26 ± 0.99 (range: 15–23). There were 785 (39.4%), 638 (32.0%), and 569 (28.6%) students from grades 10, 11, and 12 respectively. Within them, 364 (18.3%) students were classified under Internet addiction. The prevalence rate of males (22.6%) was significantly higher than females (12.6%; $\chi^2 = 32.23$, $p < 0.001$).

In Table 1, the t test revealed that females had higher scores than males on subscales of entitlement, emotional discomfort, and total scores of FDS.

Adolescents with Internet addiction had higher scores on four subscales and the total scale.

The general linear model analysis revealed that the interaction terms of FDS and gender are significantly associated with CIAS scores (Table 2). This finding indicated that the association between FDS and CIAS was moderated by the gender effect. Then, evaluating the association between FDS and CIAS for males and females separately revealed that the association was higher in males ($r = 0.028$, $p < 0.001$) than in females ($r = 0.014$, $p < 0.001$). Linear regression analysis (shown in Table 3) indicated that CIAS was positively associated with discomfort intolerance and negatively associated with achievement intolerance among females. However, the CIAS was positively associated with entitlement intolerance and discomfort intolerance among males. This result further supports the gender difference of the association between FDS and CIAS.

TABLE 2. ASSOCIATION OF CHEN INTERNET ADDICTION SCALE SCORES WITH INTERACTION TERM OF GENDER AND FRUSTRATION-DISCOMFORT SCALE

	df	Mean square	F	P
Male	1	7.387	0.05	0.832
FDS	1	14038.432	85.59	<0.001
Male \times FDS	1	1312.654	8.00	0.005
Error	1988	164.024		

Note: ANOVA was used with the general linear model procedure to determine whether the interaction term of gender and FDS was associated with scores of Chen Internet Addiction Scale.

FDS, Frustration Discomfort Scale.

TABLE 3. MULTIPLE REGRESSION ANALYSIS FOR ASSOCIATION BETWEEN SUBSCALE OF FRUSTRATION-DISCOMFORT SCALE AND CHEN INTERNET ADDICTION SCALE

	Male		Female	
	B	T	β	T
Age	0.05	1.62	0.03	0.83
Discomfort intolerance	0.10	2.04*	0.17	3.20**
Entitlement	0.15	2.70**	0.07	1.25
Emotional intolerance	0.02	0.37	0.05	0.99
Achievement	0.05	0.88	-0.13	-2.58**
	$F = 19.81^{***}$	$R^2 = 0.08$	$F = 6.73^{***}$	$R^2 = 0.04$

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

DISCUSSION

This is the first study to test the association between belief of frustration intolerance and Internet addiction in adolescents. The result revealed adolescents with Internet addiction hold higher irrational beliefs of frustration intolerance. According to the "ABCDE" model of REBT, when facing an activating event, the irrational belief will cause the dysfunctional sequence.¹³ Previous reports have found that frustration intolerance is associated with behavior avoidance.⁹ Because Internet provides immediate reinforcement such as a feeling of control, synchronous interaction with others, and the freedom of self-representation,¹⁴ when facing stressful events in real life, beliefs of frustration intolerance may make adolescents unwilling to tolerate negative emotional events, and they may be more likely to escape from the unaccepted frustrations of daily life and seek immediate gratification from the Internet and become vulnerable to Internet addiction.

On the other hand, since many adolescents experience the Internet early in life, immediate reinforcement provided by the Internet might also influence their beliefs. If pleasure could always be experienced without coping with frustration online, long-term exposure to Internet activity may also make adolescents believe that life should be as comfortable as it is in Internet. Without effective intervention for such beliefs, these adolescents may prefer Internet activity and enter a vicious cycle. However, the causal relationship between frustration intolerance and Internet addiction should be further clarified by prospective study.

The result also revealed that female adolescents are more likely to hold the belief of intolerance to emotional distress and unfairness. It has been reported that female adolescents worry more about lack of confidence issues.¹⁵ This may contribute to their belief for entitlement. Female adolescents also

have a more negative problem orientation and engage in more thought suppression.¹⁵ This may result in more emotional distress, such as depression and anxiety, which have been reported to be more prevalent in female adolescents.¹⁶ This prevalence may be associated with their emotional intolerance belief. Hill and Linch have argued that the gender role for female adolescents brings conflict over achievement and results in depression because of fears that success will be perceived as unattractive and because of heightened self-consciousness over physical appearance.¹⁷ The conflict associated with the gender role might also account for their belief of entitlement and emotional intolerance.

Although frustration intolerance is associated with Internet addiction and is higher among female adolescents, Internet addiction is more prevalent in males. Further analysis in this study revealed that gender was a moderator for the association between frustration intolerance and Internet addiction. It demonstrated that frustration intolerance is more associated with Internet addiction for males. The gender difference of coping style may explain the higher impact on male adolescents. It has been reported that male adolescents are more likely than female adolescents to use avoidance strategies and emotional distraction coping.¹⁸ Since autonomy and independence are emphasized more on male gender role,¹⁹ it is possible that when males face stress, they feel "safe" in avoiding rather than seeking help, which they may interpret as failure. Thus, male adolescents with higher frustration intolerance might go online to avoid the stress instead of seeking help from others or professional treatment. On the other hand, it has been reported that adolescent females used more coping approaches and help-seeking behaviors than males.¹⁸ Even though they experience higher intolerance to frustration, they are more likely to cope with it by getting help from other friends or mental health professionals. The

difference of coping patterns may make males more likely to be addicted to the Internet under frustration intolerance.

The regression analysis revealed that Internet addiction was associated with emotional discomfort for both males and females. It demonstrated that intolerance of emotional discomfort was the most associated irrational belief of Internet addiction in FDS. Moreover, male adolescents with a high score on the entitlement subscale are more likely to have Internet addiction. Some Internet activities, such as online gaming, provide clearer rules to achieve higher scores and reach higher levels sooner than what real-world experience does. The distraction and avoidance coping style of male adolescents¹⁸ may explain, in part, why males are more likely to become addicted to the Internet under frustration to entitlement. This result indicated that entitlement should be evaluated and appropriate interventions designed in treatment of Internet addiction, especially for male adolescents. On the other hand, female adolescents with perfectionistic beliefs are less likely to have Internet addiction. Since females are more likely to have an approach-coping manner and to seek help from others,¹⁸ they may not fulfill their desire for perfection by making it come true with fantasies via the Internet. Their efforts in the real world to satisfy their perfectionistic beliefs may protect them from spending too much time in the virtual world. However, more comprehensive research is necessary to explain the gender difference of association between Internet addiction and frustration intolerance.

Interventions for adolescents with dysfunctional belief of frustration could be developed to dispute their irrational belief, assimilate more adaptive and rational beliefs, thereby resulting in positive impact on their behavior.¹³ Because our results demonstrated the association between frustration intolerance and Internet addiction, evaluation and intervention for frustration intolerance for adolescents with Internet addiction are indicated, especially for males. REBT focused on frustration intolerance would benefit them by modifying their perception that frustration is unacceptable and reducing their compulsion to escape via the Internet to gain non-frustrated satisfaction. Because there is a gender difference on the association between Internet addiction and frustration intolerance, REBT focused on different irrational belief should be provided for male and female adolescents with Internet addiction.

This study has several limitations that should be considered when interpreting its findings. First, a higher proportion of vocational high school stu-

dents are included than is representative of the general population. Second, all our investigations relied on self-reported data from adolescents. Third, the cross-sectional research design of the present study could not confirm causal relationships between frustration intolerance and Internet addiction.

CONCLUSION

This study demonstrates that Internet addiction is associated with belief of frustration intolerance among adolescents. More attention and REBT should be focused on irrational beliefs of frustration intolerance for adolescents with Internet addiction, especially for males. Intolerance to emotional discomfort should be emphasized in REBT for both male and female adolescents with Internet addiction, and the irrational belief of entitlement intolerance should be highlighted for male adolescents with Internet addiction. Further intervention research is necessary to evaluate the effect of REBT for Internet addiction among adolescents.

REFERENCES

1. Paul B, Bryant JA. Adolescents and the Internet. *Adolescent Medicine Clinics* 2005; 16:413–26.
2. Young KS. Internet addiction: a new clinical phenomenon and its consequences. *American Behavioral Scientist* 2004; 48:402–15.
3. Ko CH, Yen JY, Yen CF, et al. Screening for Internet addiction: an empirical research on cut-off points for the Chen Internet Addiction Scale. *The Kaohsiung Journal of Medical Sciences* 2005; 21:545–51.
4. Ko CH, Yen JY, Chen CC, et al. Tridimensional personality of adolescents with Internet addiction and substance use experience. *Canadian Journal of Psychiatry* 2006; 51:887–94.
5. Yen JY, Ko CH, Yen CF, et al. The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. *Journal of Adolescent Health* 2006.
6. Ko CH, Yen JY, Chen CC, et al. Proposed diagnostic criteria of Internet addiction for adolescents. *Journal of Nervous and Mental Disease* 2005; 193:728–33.
7. Freidenberg BM, Blanchard EB, Wulfert E, et al. Changes in physiological arousal to gambling cues among participants in motivationally enhanced cognitive-behavior therapy for pathological gambling: a preliminary study. *Applied Psychophysiology and Biofeedback* 2002; 27:251–60.
8. Ellis A, Dryden W. (1987). *The practice of rational emotive therapy*. New York: Springer.

9. Harrington N. Dimensions of frustration intolerance and their relationship to self-control problems. *Journal of Rational-Emotive and Cognitive-Behavior Therapy* 2005; 23:1–20.
10. Harrington N. The Frustration Discomfort Scale: development and psychometric properties. *Clinical Psychology and Psychotherapy* 2005; 12:374–87.
11. Ko CH, Yen JY, Chen CC, et al. Gender differences and related factors affecting online gaming addiction among Taiwanese adolescents. *The Journal of Nervous and Mental Disease* 2005; 193:273–7.
12. Chen SH, Weng LC, Su YJ, et al. Development of a Chinese Internet Addiction Scale and its Psychometric Study. *Chinese Journal of Psychology* 2003; 45: 279–94.
13. David D, Szentagotai A, Eva K, et al. A synopsis of rational-emotive behavior therapy (REBT): fundamental and applied research. *Journal of Rational-Emotive Therapy* 2005; 23:175.
14. Leung L. Net-generation attributes and seductive properties of the Internet as predictors of online activities and Internet addiction. *CyberPsychology & Behavior* 2004; 7:333–48.
15. Robichaud M, Dugas MJ, Conway M. Gender differences in worry and associated cognitive-behavioral variables. *Journal of Anxiety Disorders* 2003; 17: 501–16.
16. Garber J. Depression in children and adolescents: linking risk research and prevention. *American Journal of Preventive Medicine* 2006; 31:S104–25.
17. Hill J, Linch M. (2007) The intensification of gender-related role expectation during early adolescence, in female puberty. In: Brooks-Gunn J, Petersen AC, eds. *Girls at puberty*. New York: Plenum, pp. 201–28.
18. Öngen D. The relationships between coping strategies and depression among Turkish adolescents. *Social Behavior & Personality: An International Journal* 2006; 34:181–95.
19. Gilligan C. (2007) *In a different voice*. Cambridge, MA: Harvard University Press.

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