Depression mediates the relationship between distress tolerance and Internet addiction among adolescents: One-year follow-up

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Introduction

Previous study on the relationship between distress tolerance and Internet addiction (IA) was cross-sectional, and no study in the past has examined depression as a potential mechanism that underlies the relationship between distress tolerance and adolescent IA. To partly address these gaps, the aim of this study was to examine whether distress tolerance would increase the risk for IA, mediated through depression in a large sample of senior high school students. The study incorporated a one-year follow-up design.

Methods

Participants were recruited from senior high schools throughout Taiwan using both stratified and cluster sampling in 2014 (time 1; T1) and 2015 (time2; T2). In T1, stratified and cluster sampling was used to obtain a representative sample of the Taiwan senior high school student population, using school type (regular high school or vocational high school) as the strata and class as the cluster. A total of 2,253 senior high school students were invited to participate in T1. Of the 2,253 students, 2,170 students (1,129 females) participated, resulting in a response rate of 96.32%. In T2, 1,832 students were successfully followed, resulting in an attrition rate of 15.58%. The Distress Tolerance Scale, Ko's Depression Inventory, and Chen Internet Addiction Scale were used to assess distress tolerance, depression, and the levels of IA, respectively.

Results

The correlations presented in Table 1 showed that T1 total distress tolerance was significantly and positively correlated with T2 depression and IA severity, respectively. Moreover, T2 depression and IA severity were positively correlated with one another. In addition, structure equation modeling results revealed that distress tolerance (T1) had a significant effect on IA (T2) after controlling for IA measured at T1 in model 1 (Figure 1). Moreover, the effect of distress tolerance (T1) to IA (T2) decreased from .09 (p < .001) in model 1 to .00 (p = .895) in model 2 (Figure 2). The mediation model accounted for 46.0% of the variance in IA (T2), and had a good model-fit evaluation (CFI = .977, IFI =.977, NFI = .972, NNFI=.969, RMSEA = .045). Furthermore, the Sobel test indicated that the mediated effect was significant for "Distress tolerance (T1) – Depression (T2) – IA (T2)" (z = 6.56, p<.001) after controlling for IA measured at T1, demonstrating a mediating effect from distress tolerance to IA through depression.

Conclusion

These results provide empirical evidence to verify that lower distress tolerance was able to positively predict the later development of IA among senior high school students. This relationship, however, was fully mediated by depression. Results from the present study might help mental health organizations and educational agencies design suitable IA prevention programs geared toward the senior high school population.
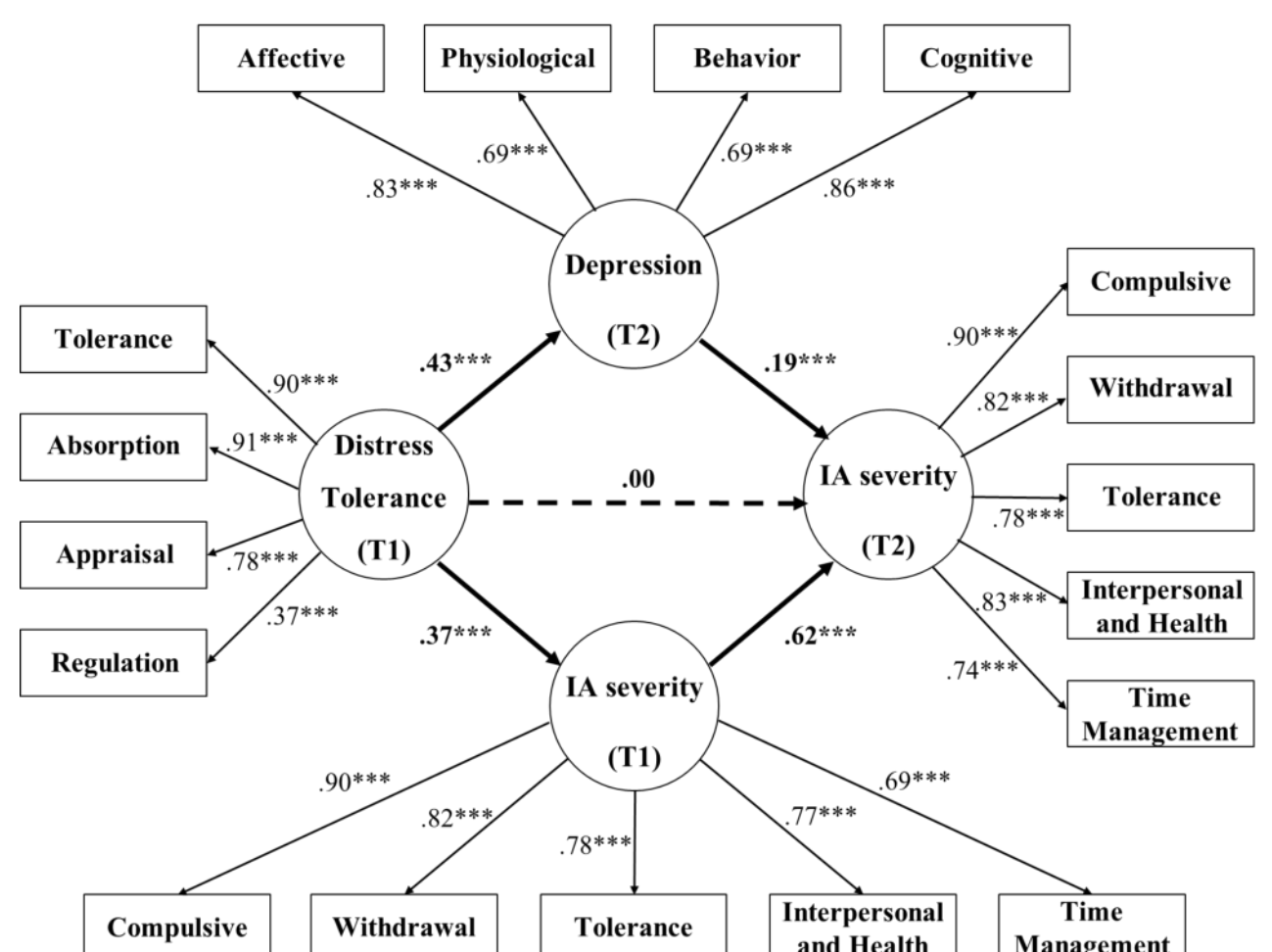
Table 1. The correlations among measures

Variables	1	2	3	4
1. Distress tolerance (Time 1)	—			
2. Depression (Time 2)	.35***	—		
3. IA severity (Time 1)	.31***	.25***	—	
4. IA severity (Time 2)	.26***	.32***	.64***	—
M	39.80	11.63	51.39	49.92
SD	10.16	9.28	13.01	13.40

***p<.001.
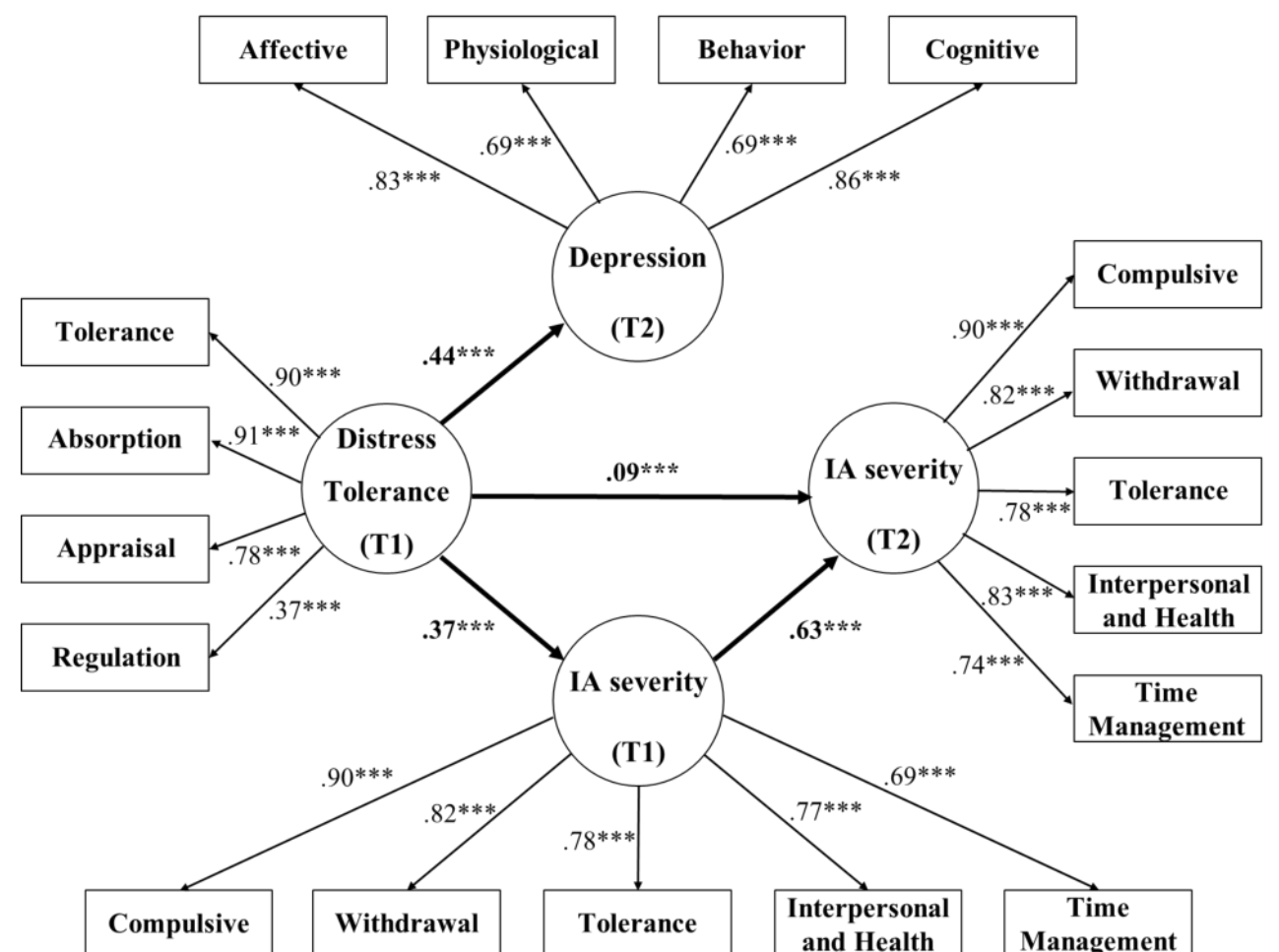
Figure 1. Mediational model 1. Chi-square: 652.26*** (df: 126); CFI: .97; IFI: .97; NFI: .97; NNFI: .97; RMSEA: .048; ***p<.001.

Figure 2. Mediational model 2. Chi-square: 586.95*** (df: 125); CFI: .98; IFI: .98; NFI: .97; NNFI: .97; RMSEA: .045; ***p<.001.