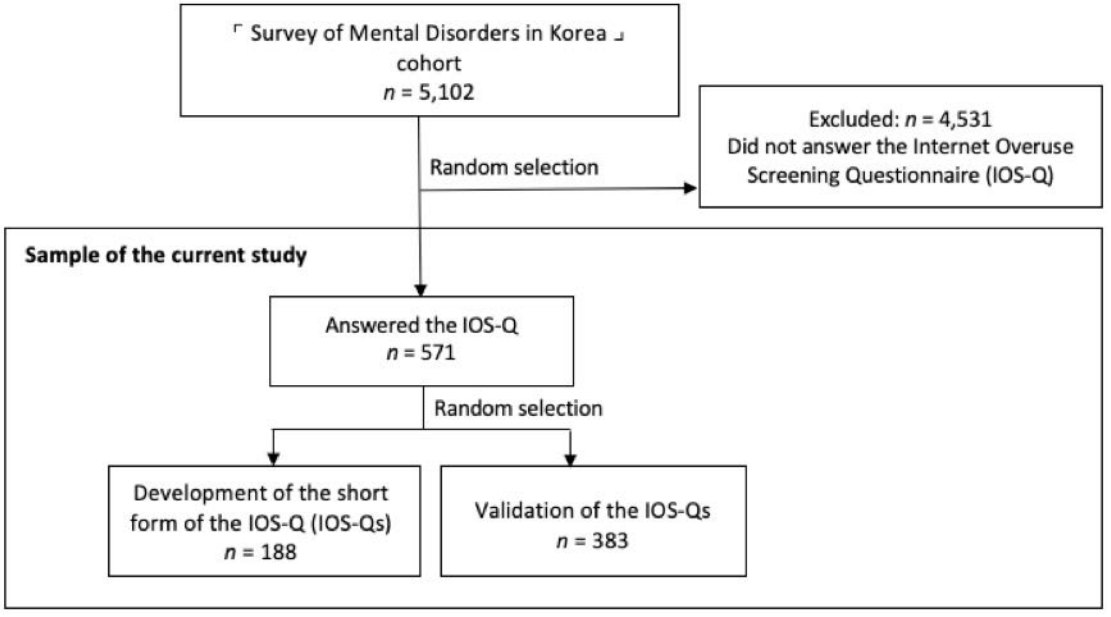
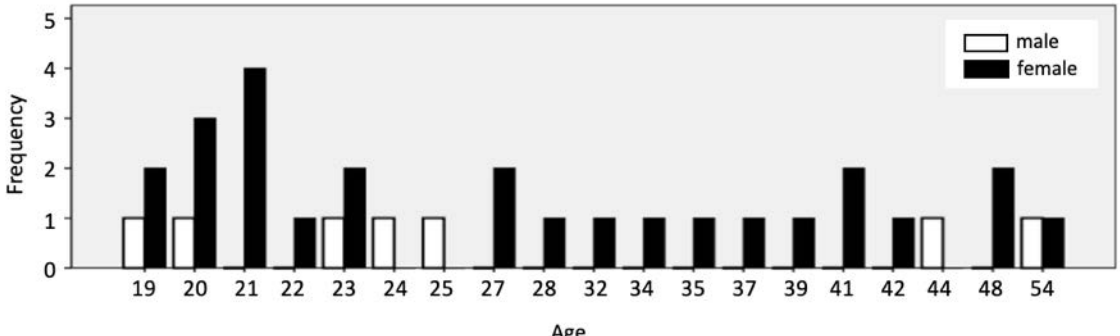

「 Survey of Mental Disorders in Korea 」 cohort
n = 5,102
Random selection
Excluded: n = 4,531
Did not answer the Internet Overuse Screening Questionnaire (IOS-Q)
Sample of the current study
Answered the IOS-Q
n = 571
Random selection
Development of the short form of the IOS-Q (IOS-Qs)
n = 188
Validation of the IOS-Qs
n = 383


male
female
Frequency
0
1
2
3
4
5
19
20
21
22
23
24
25
27
28
32
34
35
37
39
41
42
44
48
54
Age

Supplementary Figure 1.

Flow chart of the studied sample

Supplementary Figure 2.

Frequencies of problematic internet over-users across gender and age

Supplementary table 1

Subject demographics

Variables	Development sample (*n* = 188)	Validation sample (*n* = 383)	Total (*N* = 571)
Age (years)			
18–29	73 (38.8)	147 (38.4)	220 (38.5)
30–39	39 (20.7)	84 (21.9)	123 (21.5)
40–49	37 (19.7)	81 (21.1)	118 (20.7)
50–59	28 (14.9)	48 (12.5)	76 (13.3)
60–69	10 (5.3)	15 (3.9)	25 (4.4)
70–79	1 (0.5)	6 (1.6)	7 (1.2)
≥80	0 (0.0)	2 (0.5)	2 (0.4)
Mean (standard deviation)	46.78 (13.27)	36.74 (13.55)	36.75 (13.44)
Range	18-73	18-81	18-81
Gender			
Male	94 (50.0)	198 (51.7)	292 (51.1)
Female	94 (50.0)	185 (48.3)	279 (48.9)
Education			
≤ Elementary school (≤ 6years)	1 (0.5)	8 (2.1)	9 (1.6)
Middle school (7-9 years)	3 (1.6)	8 (2.1)	11 (1.9)
High school (10-12 years)	34 (18.1)	70 (18.3)	104 (18.2)
> University (> 12 years)	150 (79.8)	297 (77.5)	447 (78.3)
Mean (standard deviation)	15.18 (2.61)	14.64 (2.84)	14.75 (2.78)
Range	6-24	0-26	0-26
Marital status			
Married	92 (48.9)	180 (47.0)	272 (47.6)
Divorced/ Widowed	7 (3.8)	24 (6.3)	31 (5.5)
Unmarried	89 (47.3)	179 (46.7)	268 (46.9)

Supplementary table 2

Response frequencies comparing the original Internet Overuse Screening Questionnaire (IOS-Q) in the development sample (*n* = 188) to the short-form of the IOS (IOS-Qs) and validation sample (*n* = 383).

	Development of the IOS-Q (28 items, *n* = 188)				Validation of the IOS-Qs (8 items, *n* = 383)			
	Response categories[b]				Response categories			
Item number[a]	1	2	3	4	1	2	3	4
7	173	12	2	1	340	33	7	3
6	178	8	2	0	341	35	7	0
22	178	9	1	0	350	29	3	1
21	180	7	1	0	352	26	4	1
18	181	7	0	0	369	13	1	0
23	183	5	0	0	358	22	3	0
14	184	4	0	0	374	9	0	0
24	185	3	0	0	366	14	3	0
Items not used in IOS-Qs								
1	145	39	3	1	289	86	8	0
2	162	23	2	1	322	59	2	0
3	167	18	3	0	322	50	10	1
4	168	18	1	1	330	43	9	1
5	132	45	8	3	255	86	33	9
8	169	15	4	0	333	41	5	4
9	150	28	8	2	285	74	21	3
10	158	20	9	1	297	64	17	5
11	172	13	3	0	343	34	6	0
12	119	51	14	4	243	105	31	4
13	161	20	6	1	336	37	9	1
15	183	3	2	0	358	17	5	3
16	155	26	5	2	298	74	9	2
17	183	3	1	1	373	9	1	0
19	168	14	5	1	325	49	7	2
20	163	20	3	2	312	57	12	2
25	186	2	0	0	383	0	0	0
26	171	14	2	1	343	31	7	2
27	164	18	4	2	319	56	8	0
28	155	25	7	1	313	57	9	4

Note. [a]Item number of the original scale (Lee et al., 2017) was presented. [b]1 = “never”, 2 = “sometimes”, 3 = “frequently”, 4 = “always”.

Supplementary table 3

Factor structure of Short form of the Internet Overuse Screening Questionnaire (IOS-Qs)

Item number of the original scale (Lee et al., 2017 [22])	Pattern Matrix	
	Factor1	Factror2
22. I like using the internet more than spending time with family.	.939	.001
21. I like using the internet more than socializing with friends.	.817	-.096
24. I am not interested in anything except using the internet.	.617	-.076
23. I quarrel with family due to my internet use.	.468	-.008
14. I skip school or work to go somewhere where I can use the internet.	.283	.135
7. I become irritated or angry without the internet.	.061	.718
18. I am late for school, work, appointments, etc. due to my internet use.	-.085	.693
6. I need to use the internet for a longer period of time to become as satisfied as before.	.199	.532

Note. items were presented in orders of the coefficients.

Supplementary table 4

Correlations among items and sub-scores and total scores

Item	22	21	24	23	14	7	18	6	Factor1	Factor2
21	.776**									
24	.589**	.496**								
23	.396**	.316**	.338**							
14	.303**	.153**	.306**	.319**						
7	.452**	.302**	.293**	.216**	.215**					
18	.273**	.199**	.258**	.083	.137**	.492**				
6	.452**	.333**	.357**	.221**	.262**	.488**	.396**			
Factor1	.891**	.825**	.745**	.643**	.460**	.414**	.263**	.449**		
Factor2	.512**	.360**	.381**	.236**	.266**	.875**	.685**	.809**	.488**	
Total	.834**	.713**	.673**	.532**	.432**	.719**	.524**	.706**	.891**	.831**

Note. **$p < .01$. Factor1 was a sum score of item 22, 21, 24, 23, and 14, which highly loaded to factor 1. Factor 2 was a sum score of item 7, 18, and 6, which highly loaded to factor 2.

Supplementary table 5

Comorbidities of problematic internet over-users classified by latent-class analysis using the original scale with 28 items (Lee et al., 2017)

Dependent variables	*b*	*SE*	OR [95% CI]	*p*
All mental disorders	**1.11**	**0.41**	**2.89 [1.31, 6.39]**	**.009**
Mood disorder	**2.03**	**0.63**	**7.60 [2.21, 26.11]**	**.001**
Depressive disorder	**1.74**	**0.65**	**5.69 [1.59, 20.42]**	**.008**
Dysthymic disorder	-	-	-	-
Bipolar disorder	-	-	-	-
Anxiety disorder	1.10	0.98	2.30 [0.44, 20.48]	.263
Post-traumatic stress disorder	-	-	-	-
Obsessive compulsive disorder				
Panic disorder	-	-	-	-
Agoraphobia	-	-	-	-
Social anxiety disorder	1.08	1.03	2.93 [0.39, 22.01]	.296
Generalized anxiety disorder	-	-	-	-
Nicotine use disorder	0.26	0.83	1.30 [0.26, 6.62]	.753
Alcohol use disorder	0.08	0.68	1.01 [0.27, 3.81]	.991

Note. *SE* = standard error, OR = odds ratio, CI = confidence interval