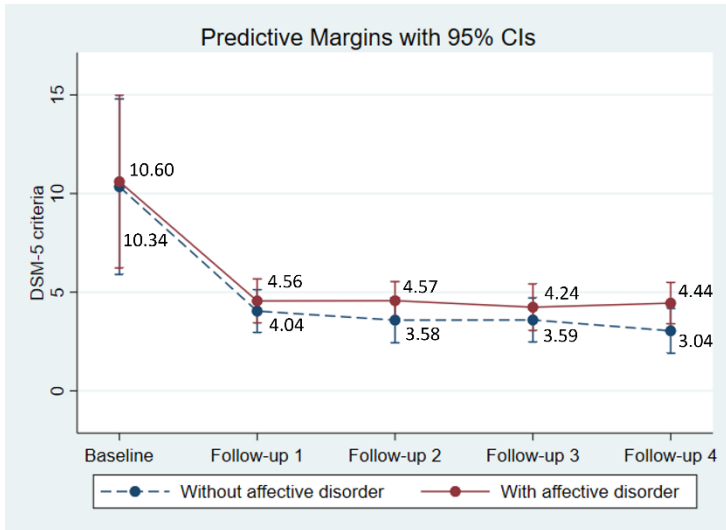


Wullinger, P. M. et al.: **Longitudinal associations between psychiatric comorbidity and the severity of gambling disorder: results from a 36-month follow-up study of clients in**

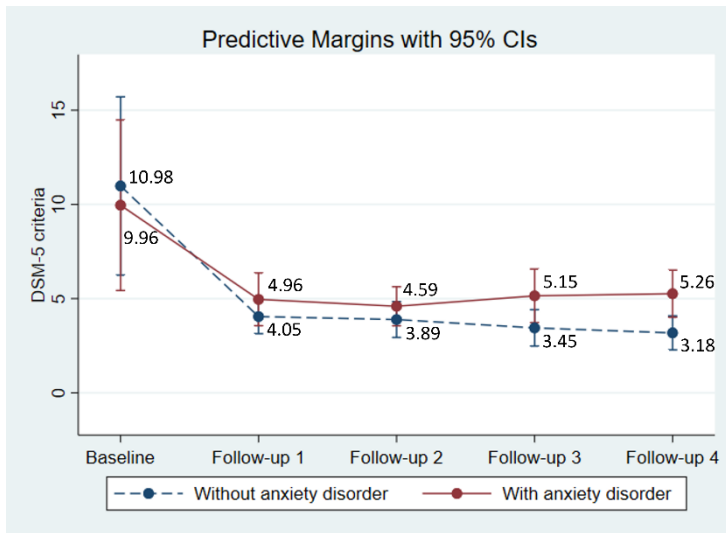
Bavarian outpatient addiction care

<https://doi.org/2006.2023.00026>

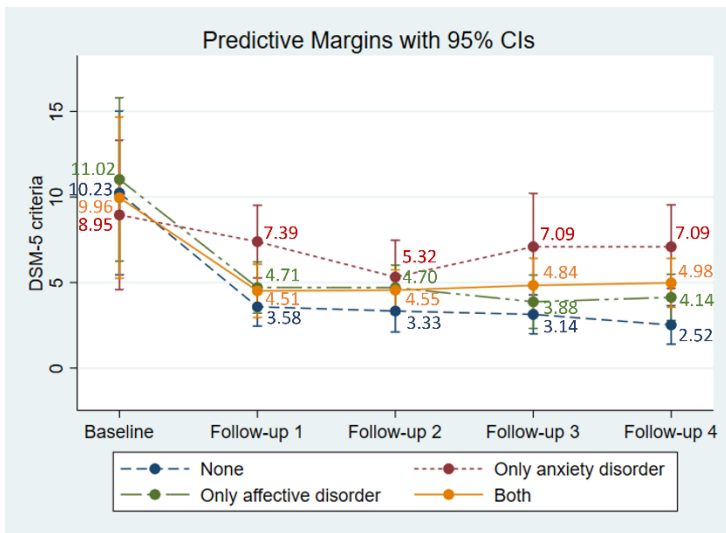
SUPPLEMENTARY MATERIALS



a:



b:



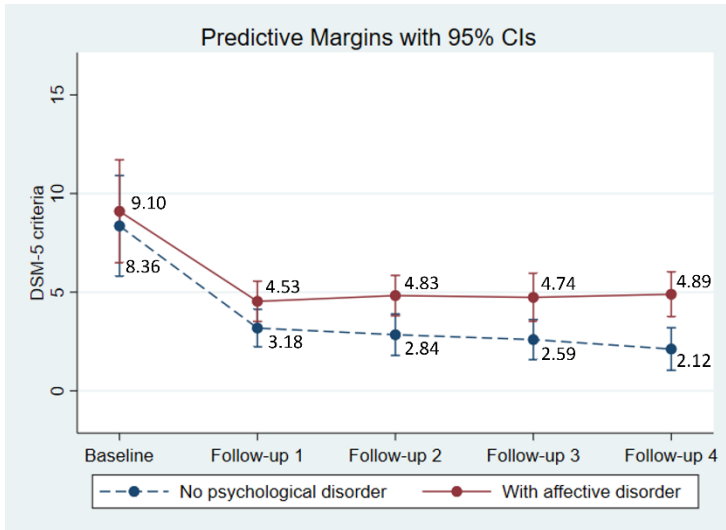
c:

Figure S1. Sensitivity analysis 1 with exclusively completers.

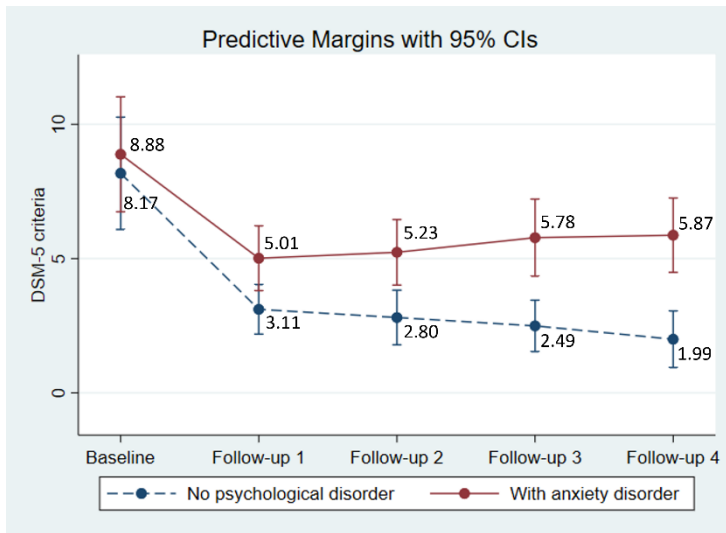
a: Model-based trajectories for GD severity by presence of affective disorders.

b: Model-based trajectories for GD severity by presence of anxiety disorders.

c: Model-based trajectories for GD severity with consideration of interplay between affective and anxiety disorders.



a:



b:

Figure S2. Sensitivity analysis 2 with participants without any psychiatric comorbidity as comparison group.

a: Model-based trajectories for GD severity by presence of affective disorders.

b: Model-based trajectories for GD severity by presence of anxiety disorders.

Table S1

Demographic variables, GD severity, and psychiatric comorbidities at baseline and treatment status at follow-up 2 for completers and dropouts

	Completers	Dropouts	Comparison test	<i>p</i>-value
	61 (49.6) ^a	62 (50.4) ^a		
Variables				
Age in years, <i>M</i> (<i>SD</i>)	37.7 (10.8)	35.9 (10.4)	-0.85 ^b	0.396
Sex, <i>n</i> (%)				
Male	54 (88.5)	55 (88.7)	0.00 ^c	0.974
Migration background, <i>n</i> (%)				
Yes	15 (24.6)	20 (32.3)	0.89 ^c	0.346
Treatment status (at follow-up 2), <i>n</i> (%)	n = 60	n = 58		
Still in treatment	3 (5.0)	4 (6.9)	1.48 ^c	0.476
Regular termination	25 (41.7)	18 (31.0)		
Irregular termination	32 (53.3)	36 (62.1)		

GD severity, *M* (*SD*)

Fulfilled criteria of GD	7.8 (1.5)	8.0 (1.2)	0.60 ^b	0.549
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Psychiatric comorbidity, *n* (%)

Yes	34 (55.7)	42 (67.7)	1.88 ^c	0.171
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Affective disorders, <i>n</i> (%)	31 (50.8)	37 (59.7)	0.98 ^c	0.323
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<i>Depressive disorders</i>	30 (49.2)	31 (50.0)	0.01 ^c	0.928
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Major Depression – single episodes	12 (19.7)	16 (25.8)		
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Major Depression – recurrent	13 (21.3)	9 (14.5)		
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Dysthymic disorder	16 (26.2)	16 (25.8)		
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<i>Bipolar disorders</i>	2 (3.3)	8 (12.9)	3.81 ^c	0.051
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Bipolar I disorder	--	7 (11.3)		
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Bipolar II disorder	2 (3.3)	1 (1.6)		
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Anxiety disorders, <i>n</i> (%)	17 (27.9)	24 (38.7)	1.63 ^c	0.202
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Panic disorder	3 (4.9)	5 (8.1)		
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Agoraphobia	1 (1.6)	2 (3.2)		
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Specific phobia	11 (18.0)	17 (27.4)		
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Social phobia	4 (6.6)	6 (9.7)		
Generalized anxiety disorder	1 (1.6)	1 (1.6)		
Unspecified anxiety disorder	--	2 (3.2)		
Obsessive-compulsive disorder	4 (6.6)	6 (9.7)		
Post-traumatic stress disorder	1 (1.6)	5 (8.1)		
Affective disorders only, <i>n</i> (%)	17 (27.9)	18 (29.0)	0.02 ^c	0.886
Anxiety disorders only, <i>n</i> (%)	3 (4.9)	5 (8.1)	0.50 ^c	0.479
Both disorders, <i>n</i> (%)	14 (23.0)	19 (30.7)	0.93	0.336

Note. Case numbers for some participant characteristics are very small; X^2 tests should be interpreted with caution.

GD = gambling disorder, *M* = mean value, *n* = participant count, *SD* = standard deviation

^aFor some analyses, *n* differ due to missing data and are reported separately.

^bStudent's *t*-test for interval variables

^cPearson X^2 test for ordinal and nominal variables

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table S2

Unadjusted mean GD severity (i.e., fulfilled DSM-5 criteria) (n, M, SD) at baseline and follow-ups 1 through 4 for the total sample, differentiated for participants with and without a psychiatric comorbidity

	Total sample			With psychiatric comorbidity			Without any psychiatric comorbidity			Comparison test ^a	p-value
	n	M	SD	n	M	SD	n	M	SD		
GD severity											
Baseline	123	7.88	1.36	76	8.16	1.10	47	7.43	1.63	-2.98	0.003
Follow-up 1	97	4.32	3.44	59	4.98	3.42	38	3.29	3.24	-2.43	0.017
Follow-up 2	87	4.25	3.45	51	5.27	3.32	36	2.81	3.15	-3.49	0.000
Follow-up 3	77	4.34	3.52	47	5.17	3.54	30	3.03	3.12	-2.70	0.009
Follow-up 4	67	4.30	3.26	39	5.36	3.00	28	2.82	3.08	-3.38	0.001

GD = gambling disorder, M = mean value, n = participant count, SD = standard deviation

^aStudent's *t*-test for interval variables

Table S3

Comparison of model-based estimates of changes in GD scores during various assessment intervals

Time intervals	Model 1		Model 2		Model 3	
	X^2	<i>p</i> -value	X^2	<i>p</i> -value	X^2	<i>p</i> -value
Baseline – Follow-up 4	11.87	0.0006	12.38	0.0004	12.20	0.0005
Baseline – Follow-up 1	12.48	0.0004	13.15	0.0003	13.52	0.0002
Follow-up 1 – Follow-up 2	0.00	0.9718	0.02	0.8939	0.00	0.9711
Follow-up 2 – Follow-up 3	0.04	0.8377	0.04	0.8497	0.08	0.7787
Follow-up 3 – Follow-up 4	0.17	0.6828	0.14	0.7074	0.06	0.8127

Note. *p*-values < 0.05 demonstrate a statistically significant reduction of the GD score within the time interval.

Table S4

Sensitivity analysis 1: Model-based estimates of effects of psychiatric comorbidities, time, demographic variables, and treatment status on GD severity (i.e., fulfilled DSM-5 criteria) over time, with exclusively completers

	Model 1	Model 2	Model 3
	Sensitivity	Sensitivity	Sensitivity
	analysis 1	analysis 1	analysis 1
Variables	<i>IRR (SD)</i>	<i>IRR (SD)</i>	<i>IRR (SD)</i>
Time			
Baseline	REF	REF	REF
Follow-up 1	0.39 (0.10)***	0.37 (0.10)***	0.35 (0.10)***
Follow-up 2	0.35 (0.12)***	0.35 (0.11)***	0.33 (0.11)***
Follow-up 3	0.35 (0.11)***	0.31 (0.10)***	0.31 (0.10)***
Follow-up 4	0.29 (0.10)***	0.29 (0.09)***	0.25 (0.09)***
Affective disorders			
No	REF	-	REF
Yes	1.02 (0.06)	-	1.08 (0.07)
Anxiety disorders			
No	-	REF	REF
Yes	-	0.91 (0.64)	0.87 (0.10)
Time*affective disorders			
Follow-up 1	1.10 (0.20)	-	1.22 (0.28)
Follow-up 2	1.25 (0.24)	-	1.31 (0.30)
Follow-up 3	1.15 (0.24)	-	1.15 (0.31)
Follow-up 4	1.43 (0.31)	-	1.52 (0.40)

Time*anxiety disorders

Follow-up 1	-	1.35 (0.24)	2.36 (0.54)***
Follow-up 2	-	1.30 (0.23)	1.82 (0.55)*
Follow-up 3	-	1.65 (0.32)**	2.58 (0.71)***
Follow-up 4	-	1.82 (0.34)***	3.21 (0.88)***

Time* affective**disorders*anxiety disorders**

Follow-up 1	-	-	0.45 (0.14)*
Follow-up 2	-	-	0.59 (0.21)
Follow-up 3	-	-	0.53 (0.20)
Follow-up 4	-	-	0.41 (0.14)*

Affective disorders*anxiety**disorders**

Age	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
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Sex

Female	REF	REF	REF
Male	1.27 (0.13)*	1.23 (0.14)	1.28 (0.14)*

Migration background

No	REF	REF	REF
Yes	1.36 (0.13)***	1.38 (0.11)***	1.27 (0.10)**

Treatment status

Still in treatment	REF	REF	REF
Regular termination	1.16 (0.31)	1.15 (0.32)	1.11 (0.32)
Irregular termination	1.70 (0.47)	1.77 (0.51)*	1.69 (0.50)

Wald test

(Baseline – Follow-up 4)			
Time* affective disorders	3.25; $p=0.52$	-	3.66; $p=0.45$
Time* anxiety disorders	-	13.35; $p=0.0097$	31.37; $p=0.0000$
Time* affective disorders* anxiety disorders	-	-	11.73; $p=0.0195$
Number of observations	300	300	300
Number of groups	61	61	61

Notes. Model 1 analysed whether severity of GD developed differently between participants with and without affective disorders and therefore included an interaction term: *time* affective disorders*. Model 2 analysed whether severity of GD developed differently between participants with and without anxiety disorders and therefore included an interaction term: *time* anxiety disorders*. Model 3 accounted for the combined occurrence of affective and anxiety disorders and therefore included an interaction term: *time* affective disorders* anxiety disorders*.

IRR = incidence rate ratio, *REF* = reference, *SD* = standard deviation

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table S5

Sensitivity analysis 2: Model-based estimates of effects of psychiatric comorbidities, time, demographic variables, and treatment status on GD severity (i.e., fulfilled DSM-5 criteria) over time, with comparison group comprised exclusively of participants without any psychiatric comorbidity

	Model 1	Model 2
	Sensitivity analysis 2	Sensitivity analysis 2
Variables	<i>IRR (SD)</i>	<i>IRR (SD)</i>
Time		
Baseline	REF	REF
Follow-up 1	0.38 (0.09)***	0.38 (0.08)***
Follow-up 2	0.34 (0.10)***	0.34 (0.09)***
Follow-up 3	0.31 (0.09)***	0.30 (0.08)***
Follow-up 4	0.25 (0.09)***	0.24 (0.08)***
Affective disorders		
No	REF	-
Yes	1.09 (0.04)*	-
Anxiety disorders		
No	-	REF
Yes	-	1.09 (0.05)
Time*affective disorders		
Follow-up 1	1.31 (0.24)	-
Follow-up 2	1.56 (0.31)*	-
Follow-up 3	1.68 (0.37)*	-

Follow-up 4	2.12 (0.55)**	-
Time*anxiety disorders		
Follow-up 1	-	1.48 (0.28)*
Follow-up 2	-	1.72 (0.36)**
Follow-up 3	-	2.13 (0.47)***
Follow-up 4	-	2.71 (0.73)***
Time* affective disorders*anxiety disorders		
Follow-up 1	-	-
Follow-up 2	-	-
Follow-up 3	-	-
Follow-up 4	-	-
Affective disorders*anxiety disorders		
Age	1.00 (0.00)	1.00 (0.00)
Sex		
Female	REF	REF
Male	1.10 (0.08)	1.19 (0.09)*
Migration background		
No	REF	REF
Yes	1.14 (0.06)*	1.04 (0.10)
Treatment status		
Still in treatment	REF	REF
Regular termination	0.95 (0.20)	0.94 (0.18)
Irregular termination	1.36 (0.30)	1.38 (0.27)

Wald test**(Baseline – Follow-up 4)**

Time* affective disorders	9.81; $p=0.0437$	-
Time* anxiety disorders	-	17.09; $p=0.0019$
Time* affective disorders* anxiety disorders	-	-
Number of observations	412	319
Number of groups	114	89

Notes. Model 1 analysed whether severity of GD developed differently between participants with and without affective disorders and therefore included an interaction term:

time affective disorders.* Model 2 analysed whether severity of GD developed differently between participants with and without anxiety disorders and therefore included an interaction term: *time* anxiety disorders.*

IRR = incidence rate ratio, *REF* = reference, *SD* = standard deviation

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table S6

Model-based autocorrelation matrix for Model 1

	Unstructured				
Follow-up	0	1	2	3	4
0	1				
1	0.004	1			
2	-0.038	0.795	1		
3	-0.017	0.599	0.801	1	
4	0.009	0.483	0.653	0.879	1

Table A7

Model-based autocorrelation matrix for Model 2

	Unstructured				
Follow-up	0	1	2	3	4
0	1				
1	0.024	1			
2	-0.013	0.775	1		
3	0.018	0.492	0.652	1	
4	0.057	0.457	0.693	0.796	1

Table S8

Model-based autocorrelation matrix for Model 3

	Unstructured				
Follow-up	0	1	2	3	4
0	1				
1	0.010	1			
2	-0.013	0.700	1		
3	0.008	0.502	0.679	1	
4	0.053	0.449	0.697	0.893	1