Table S1: Group differences in sleep and circadian parameters in the subsample of participants with at least 7 nights of recording

Factor*	Control, $n = 36$	Anxiety, $n = 49$	Depression, $n = 129$	Bipolar, $n = 78$	Psychosis, $n = 30$	F	p value
Average sleep parameters							
Sleep onset	23:19 ± 1:18	24:12 ± 1:37	24:03 ± 1:34	23:56 ± 1:25	23:51 ± 1:36	$2.3_{4,314}$	0.06
Sleep offset	7:35 ± 1:01	9:05 ± 1:43	8:52 ± 1:35	9:02 ± 1:34	9:17 ± 1:25	$6.7_{4,314}$	< 0.001
Sleep period, min	496.1 ± 62.3	533.0 ± 53.6	529.0 ± 60.2	545.7 ± 68.8	565.1 ± 89.5	$5.6_{4,314}$	< 0.001
TST, min	436.1 ± 53.0	457.4 ± 50.6	450.7 ± 51.8	472.8 ± 65.2	487.8 ± 94.1	$4.6_{4,314}$	0.001
WASO, min	60.0 ± 26.3	75.6 ± 30.5	77.5 ± 27.6	72.9 ± 25.0	76.1 ± 35.8	$3.5_{4,314}$	0.008
SE, %	88.2 ± 4.3	86.0 ± 5.5	85.4 ± 4.6	86.6 ± 4.3	86.0 ± 6.9	$3.5_{4,314}$	0.009
Variability indexes							
Sleep onset SD	1:04 ± 0:38	1:25 ± 0:50	1:20 ± 0:48	1:27 ± 0:55	1:48 ± 1:01	$3.8_{4,317}$	0.005
Sleep offset SD	1:00 ± 0:22	1:28 ± 0:42	1:32 ± 0:51	1:31 ± 0:52	1:41 ± 0:45	$4.3_{4,317}$	0.002
Sleep period SD	78.4 ± 39.1	96.8 ± 30.5	97.3 ± 44.7	104.0 ± 54.6	113.0 ± 59.6	$2.4_{4,317}$	0.05
TST SD	66.7 ± 31.0	84.5 ± 31.0	83.9 ± 35.2	90.1 ± 50.2	99.2 ± 50.3	$2.5_{4,317}$	0.041
WASO SD	21.3 ± 12.1	25.1 ± 10.7	27.4 ± 15.4	25.2 ± 12.3	28.7 ± 18.9	$1.7_{4,317}$	0.15
SE SD	3.3 ± 1.7	3.7 ± 1.8	4.1 ± 2.1	3.6 ± 1.8	3.7 ± 2.1	$2.1_{4,317}$	0.08
Circadian activity rhythm							
Amplitude	1.73 ± 0.38	1.87 ± 0.53	1.92 ± 0.74	1.77 ± 0.51	1.77 ± 0.58	$1.4_{4,279}$	0.23
Acrophase	14:09 ± 3:46	16:24 ± 1:32	15:44 ± 4:25	16:07 ± 1:53	15:49 ± 1:27	$2.4_{4,279}$	0.048
α	−0.39 ± 0.26	−0.34 ± 0.22	−0.40 ± 0.29	−0.33 ± 0.27	−0.24 ± 0.27	$2.5_{4,279}$	0.042
β	9.34 ± 6.10	6.19 ± 4.15	7.38 ± 10.99	7.92 ± 7.16	6.09 ± 6.44	$0.5_{4,279}$	0.77

SD = standard deviation; SE = sleep efficiency; TST = total sleep time; WASO = wake after sleep onset.

*Means ± standard deviations of actigraphic sleep and circadian parameters across primary diagnostic groups and statistics (analysis of covariance [sleep onset/offset, WASO, TST, SE] or rank analysis of covariance [α, β and all variability indexes: SD]). Sleep onset time tended to occur later in the anxiety, depression and bipolar groups than in the control group (all $p ≤ 0.024$). Sleep offset time occurred significantly later in all 4 psychiatric groups than in the control group (all contrast $p < 0.001$). The sleep period was significantly longer in the bipolar and psychosis (all $p ≤ 0.001$) groups than in the control group, with a similar trend for the anxiety and depression groups (both $p < 0.012$). The psychosis group had a longer sleep period than the depression group ($p = 0.003$). TST was longer in the psychosis group than in the control group ($p < 0.001$) and the depression group ($p = 0.001$). Sleep onset SD was significantly higher in the bipolar ($p = 0.002$) and psychosis ($p < 0.001$) groups than in the control group, with a similar trend for the anxiety ($p = 0.007$) and depression ($p = 0.005$) groups. Sleep offset SD was significantly higher in all clinical groups than in the control group (all $p ≤ 0.004$). All clinical subgroups tended to have a higher sleep period SD than the control group. TST SD was significantly higher in the psychosis group than in the control group ($p = 0.003$). A similar trend was found for all other groups ($p < 0.026$). The anxiety, depression and bipolar groups had significantly more WASO than the control group (all $p < 0.005$), with a similar trend for the psychosis group ($p = 0.010$). SE was significantly lower in the depression than the control group ($p < 0.001$), with a similar trend for all other groups ($p < 0.034$). SE SD tended to be higher in the depression than the control group ($p = 0.009$). The anxiety and bipolar ($p < 0.005$) groups had a significantly later acrophase than the control group, with a similar trend for the depression group ($p = 0.017$). The α was significantly larger in the psychosis group than in the depression group ($p = 0.004$).

Table S2: Group differences in sleep and circadian parameters controlling for sedative-hypnotic/stimulant medications, age, sex and the number of nights of actigraphy recording

Factor*	Control, n = 41	Anxiety, n = 33	Depression, n = 87	Bipolar, n = 48	Psychosis, n = 17	F	p value
Average sleep parameters							
Sleep onset	23:18 ± 1:15	24:19 ± 1:37	23:54 ± 1:16	23:51 ± 1:17	23:24 ± 1:14	$4.1_{4,217}$	0.003
Sleep offset	31:39 ± 1:01	33:34 ± 1:41	32:42 ± 1:25	32:57 ± 1:15	32:59 ± 1:09	$9.5_{4,217}$	< 0.001
Sleep period, min	500.6 ± 60.1)	555.2 ± 60.3	527.3 ± 58.8	545.8 ± 64.8	574.8 ± 63.8	$6.3_{4,217}$	< 0.001
TST, min	441.4 ± 53.1	472.9 ± 62.7	449.5 ± 49.9	473.5 ± 65.4	510.7 ± 69.6	$6.4_{4,217}$	< 0.001
WASO, min	59.2 ± 25.4	82.3 ± 26.8	76.6 ± 30.0	72.4 ± 24.6	62.1 ± 23.0	$4.6_{4,217}$	0.001
SE, %	88.4 ± 4.3	85.2 ± 5.2	85.5 ± 5.0	86.6 ± 4.5	88.7 ± 4.5	$4.7_{4,217}$	0.001
Variability indexes							
Sleep onset SD	1:05 ± 0:36	1:24 ± 0:50	1:15 ± 0:41	1:19 ± 0:47	1:32 ± 0:45	$2.2_{4,221}$	0.07
Sleep offset SD	1:00 ± 0:24	1:30 ± 0:48	1:25 ± 0:45	1:27 ± 0:52	1:39 ± 0:48	$2.9_{4,221}$	0.023
Sleep period SD	76.6 ± 37.1	106.4 ± 41.4	93.8 ± 44.0	100.4 ± 53.5	99.6 ± 32.0	$3.3_{4,221}$	0.012
TST SD	65.8 ± 29,2	91.9 ± 38.9	80.6 ± 32.6	88.2 ± 51.8	94.4 ± 32.1	$3.4_{4,221}$	0.010
WASO SD	20.4 ± 11,8	28.4 ± 13.2	27.6 ± 17.3	22.6 ± 9.1	21.1 ± 7.2	$2.7_{4,221}$	0.033
SE SD	3.2 ± 1.6	4.1 ± 2.2	4.1 ± 2.3	3.4 ± 1.6	2.7 ± 0.9	$3.5_{4,221}$	0.009
Circadian activity rhythm							
Amplitude	1.72 ± 0.35	1.86 ± 0.61	1.89 ± 0.77	1.76 ± 0.52	1.79 ± 0.63	$0.7_{4,189}$	0.60
Acrophase	14.3 ± 3.5	16.6 ± 1.3	15.4 ± 5.2	16.0 ± 1.7	15.6 ± 1.3	$1.8_{4,189}$	0.13
α	−0.39 ± 0.24	−0.30 ± 0.17	−0.38 ± 0.31	−0.31 ± 0.32	−0.25 ± 0.26	$2.6_{4,193}$	0.038
β	10.19 ± 8.28	6.25 ± 4.63	8.11 ± 13.08	9.82 ± 8.61	7.05 ± 8.28	$2.9_{4,193}$	0.023

SD = standard deviation; SE = sleep efficiency; TST = total sleep time; WASO = wake after sleep onset.
*Means ± standard deviations of actigraphic sleep and circadian parameters across primary diagnostic groups and statistics (analysis of covariance [sleep onset/offset, WASO, TST, SE] or rank analysis of covariance [α, β and all variability indexes: SD]). Seep onset occurred later in the anxiety group than in the control group (p = 0.001), with similar trends for the depression and bipolar groups (p < 0.015). Sleep offset occurred significantly later in all 4 psychiatric groups than in the control group (all contrast p ≤ 0.001).The sleep period was significantly longer in the anxiety, bipolar and psychosis (all p ≤ 0.002) groups than in the control group, with a similar trend for the depression group (p = 0.023). The psychosis group had a longer sleep period than the depression group (p = 0.001). TST was longer in the psychosis group than in the control group (p < 0.001), with a similar trend in the bipolar group (p = 0.037). Sleep onset SD tended to be higher in the anxiety (p = 0.015), bipolar (p = 0.053) and psychosis (p = 0.017) groups than in the control group. Sleep offset SD was significantly higher in the psychosis group than in the control group (p = 0.005), with similar trends for all other primary diagnosis subgroups (all p ≤ 0.031). The anxiety group had a significantly higher sleep period SD than the control group (p = 0.001), with a similar trend for all other primary diagnosis groups (p < 0.045). TST SD was significantly higher in the anxiety and psychosis groups than in the control group (p ≤ 0.004), with a similar trend for all other primary diagnosis groups (p ≤ 0.044). The anxiety and depression groups had more WASO than the control group (all p < 0.001), with a similar trend for the bipolar group (p = 0.009). Sleep efficiency was significantly lower in the anxiety and depression groups (p ≤ 0.002), with a similar trend for the bipolar group (p = −0.017). WASO SD was significantly higher in the anxiety than the control group (p = 0.003), with a similar trend for the depression group (p = 0.018). The SE SD tended to be higher in the anxiety and depression groups than in the control group (p ≤ 0.016). The anxiety and psychosis groups tended to have a higher α (p ≤ 0.026) and a lower β than the control group (p ≤ 0.016).