

Appendix

Research overview and figures

CU Medicine led the study, collaborating with 10 hospitals in the Greater Bay Area to recruit 191 participants whose parents have been diagnosed with bipolar disorder, while 202 participants whose parents don't have bipolar disorder were recruited as a control group. All participants ranged in age from 6 to 21 years. The research team collected data on the mental health, sleep and circadian rhythm of these participants. They then compared the child participants (aged under 12 years) and the adolescent participants (aged 12 years and over) separately against their respective age-matched control groups.

Overall, the offspring of bipolar disorder patients had higher risks of developing circadian, mental or mood problems than the control group (see Table 1 below for details). When analysed by age group, children of bipolar disorder patients showed a higher risk of behavioural symptoms during their childhood. This then evolved into prominent delays in circadian rhythm, social anxiety and mood symptoms in adolescents (see Tables 2 and 3 below for details).

Table 1: Risk of developing mental disorders or symptoms in bipolar disorder patients' offspring

Mental disorders or symptoms	Risk of developing corresponding mental disorder or symptom in bipolar disorder patients' offspring, compared to controls
Mood symptoms/disorders	Fivefold higher
Social anxiety symptoms/disorders	Fivefold higher
Depressive mood/disorders	Fourfold higher
Delayed sleep phase symptoms	Fourfold higher

Table 2: Risk of developing mental disorders or symptoms in bipolar disorder patients' offspring in childhood (aged under 12 years)

Mental disorders or symptoms	Risk of developing corresponding mental disorder or symptom in bipolar disorder patients' offspring, compared to age-matched controls
Behavioural symptoms	Twofold higher

Table 3: Risk of developing mental disorders or symptoms in bipolar disorder patients' offspring in adolescence (aged 12-21 years)

Mental disorders or symptoms	Risk of developing corresponding mental disorder or symptom in bipolar disorder patients' offspring, compared to age-matched controls
Social anxiety	7.5-fold higher
Delayed sleep phase symptoms	Fourfold higher
Mood symptoms	Threefold higher