Tables

Table 1 Means (SD) of raw scores for overall dysfunctional beliefs about sleep, its subscales, and symptoms of insomnia

	Means (SD)		
	Total	Males	Females
Overall DBAS	50.26 (15.24)	47.30 (15.45)*	51.78 (14.93)*
DBAS factor I	31.24 (9.36)	28.51 (9.31)*	32.66 (9.07)*
DBAS factor II	9.50 (6.07)	9.57 (6.18)	9.46 (6.02)
DBAS factor III	9.51 (4.41)	9.21 (4.31)	9.67 (4.46)
Insomnia symptoms	6.48 (5.22)	5.65 (4.89)*	6.92 (5.33)*
	MZ	DZ	Sibling
Overall DBAS	49.52 (15.34)	50.49 (15.99)	50.40 (13.78)
DBAS factor I	30.75 (9.18)	30.91 (9.92)	32.07 (8.41)
DBAS factor II	8.86 (5.69)	9.98 (6.56)	9.26 (5.52)
DBAS factor III	9.91 (4.48)	9.58 (4.46)	9.06 (4.26)
Insomnia symptoms	6.09 (4.97)	6.68 (5.38)	6.61 (5.19)

Note: * sex differences were found; Means and SD were obtained from SPSS and are based on the raw data (untransformed, including outliers, etc.); MZ = monozygotic twin; DZ = dizygotic twins; Sibling = non-twin sibling pairs; Overall DBAS = overall dysfunctional beliefs about sleep (DBAS); DBAS factor I = beliefs about the immediate negative consequences of insomnia (DBAS subscales); DBAS factor II = beliefs about the long-term negative consequences of insomnia (DBAS subscale); DBAS factor III = beliefs about the need for control over insomnia (DBAS subscale) – higher scores indicating more dysfunctional beliefs about sleep; Insomnia symptoms = insomnia symptoms (ISQ), higher scores indicating more insomnia symptoms.

Table 2 Phenotypic correlations for overall dysfunctional beliefs about sleep, its subscales, and symptoms of insomnia

	Overall DBAS	DBAS Factor I	DBAS Factor II	DBAS Factor III	Insomnia Symptoms
Overall DBAS	1				
DBAS factor I	.84**	1			
DBAS factor II	.75**	.37**	1		
DBAS factor III	.67**	.31**	.49**	1	
Insomnia symptoms	.37**	.18**	.44**	.34**	1

Note: * $p < .05$; ** $p < .01$. Correlations were calculated on data with outliers deleted and age and sex was regressed out in SPSS, using twin 1 only to control for non-independence of observations. Overall DBAS = overall dysfunctional beliefs about sleep (DBAS); DBAS factor I = beliefs about the immediate negative consequences of insomnia (DBAS subscale); DBAS factor II = beliefs about the long-term negative consequences of insomnia (DBAS subscale); DBAS factor III = beliefs about the need for control over insomnia (DBAS subscale) – higher scores indicating more dysfunctional beliefs about sleep; Insomnia Symptoms = insomnia symptoms (ISQ), higher scores indicating more insomnia symptoms.

Table 3 Twin/sibling correlations for overall dysfunctional beliefs about sleep, its subscales, and symptoms of insomnia

	Correlations		
	MZ	DZ	Sibling
Within-trait			
Overall DBAS	.15 (-.04 - .34)	.17 (0 -.32)	-.03 (-.26 - .20)
DBAS factor I	.23* (.03 - .38)	.20* (.03 - .35)	-.16 (-.37 - .07)
DBAS factor II	.05 (-.15 - .24)	.18* (.01 - .34)	.11 (-.14 - .34)
DBAS factor III	.16 (-.05 - .36)	.07 (-.10 - .23)	.10 (-.15 - .33)
Insomnia symptoms	.37* (.19 - .53)	.21* (.05 - .36)	.12 (-.13 - .34)
Cross-traits-cross-twins			
Overall DBAS - Insomnia symptoms	.14 (-.01 - .27)	.11 (-.01 - .22)	-.08 (-.28 - .13)
DBAS factor I - Insomnia symptoms	.09 (-.05 - .22)	.04 (-.07 - .14)	-.16 (-.33 - .04)
DBAS factor II - Insomnia symptoms	.09 (-.08 - .23)	.16* (.04 - .27)	0 (-.21 - .21)
DBAS factor III - Insomnia symptoms	.18* (.04 - .31)	.08 (-.04 - .19)	0 (-.18 - .18)
DBAS factor I - DBAS factor II	.02 (-.14 - .17)	.07 (-.04 - .18)	-.17 (-.36 - .10)
DBAS factor I - DBAS factor III	.04 (-.10 - .18)	-.01* (.13 - .10)	-.06 (-.25 - .15)
DBAS factor II - DBAS factor III	.11 (-.07 - .26)	.04 (-.08 - .16)	-.02 (-.24 - .20)

Note: * significant correlations (95% CI not spanning 0). The 95% confidence intervals are presented in brackets. MZ = monozygotic twins; DZ = dizygotic twins; Sibling = non-twin sibling pairs; Overall DBAS = overall dysfunctional beliefs about sleep (DBAS); DBAS factor I = beliefs about the immediate negative consequences of insomnia (DBAS subscale); DBAS factor II = beliefs about the long-term negative consequences of insomnia (DBAS subscale); DBAS factor III = beliefs about the need for control over insomnia (DBAS subscale) – higher scores indicating more dysfunctional beliefs about sleep; Insomnia symptoms = insomnia symptoms (ISQ), higher scores indicating more insomnia symptoms.

Table 4 Fit statistics of all univariate genetic model fitting analyses

Variable/ Model	ep	-2LL	Df	AIC	Δ -2LL	Δ df	*p*	*Parameter Estimates*		
Overall DBAS								A (CI)	C (CI)	E (CI)
Saturated	15	6933.43	826	5281.43	-	-	-			
ACE	4	6949.72	837	5275.72	16.29	11	.13	.09 (0 - .31)	.05 (0 - .22)	.86 (.69 - .99)
E	2	6953.24	839	5275.92	4.20	2	.12			
Beliefs about immediate consequences (DBAS Factor I)										
Saturated	15	6083.25	826	4431.25	-	-	-			
ACE	4	6101.63	837	4427.63	18.38	11	.07	.19 (.01 - .38)	0 (0 - .22)	.81 (.65 - .98)
E	2	6106.98	839	4428.98	5.35	2	.07			
Beliefs about long-term consequences (DBAS Factor II)										
Saturated	15	5275.74	819	3637.74	-	-	-			
ACE	4	5309.73	830	3649.73	33.99	11	< .01	0 (0 - .32)	.13 (0 - .24)	.87 (.68 - .99)
E	2	5314.09	832	3650.09	4.36	2	.11			
Beliefs about control (DBAS Factor III)										
Saturated	15	4873.04	826	3221.04	-	-	-			
ACE	4	4877.81	837	3203.81	4.77	11	.94	.17 (0 - .32)	0 (0 - .21)	.83 (.68 - .99)

E	2	4882.15	839	3204.15	4.34	2	.11			
Insomnia symptoms										
Saturated	15	5096.90	824	3448.90	-	-	-			
ACE	4	5112.43	835	3442.43	15.53	11	.16	.36 (0 - .53)	.03 (0 - .32)	.61 (.47 - .80)
E	2	5135.58	837	3461.58	23.15	2	< .01*			

Note: * significant correlations at a level of $p < .05$. All analyses focus on transformed data, outliers deleted with age and sex regressed out. ep = estimated parameters; -2LL = -2*(log likelihood); df = degrees of freedom; $\Delta\chi^2$ = change in chi-square statistic; Δdf = change in degrees of freedom; AIC = Akaike's Information Criterion statistic; Saturated = full model. The fit of the ACE model is relative to saturated model, the fit of the E model relative to ACE model. A = additive genetic, C = shared environmental; E = non-shared environmental. The 95% confidence intervals are presented in brackets. Overall DBAS = overall dysfunctional beliefs about sleep (DBAS); DBAS factor I = beliefs about the immediate negative consequences of insomnia (DBAS subscale); DBAS factor II = beliefs about the long-term negative consequences of insomnia (DBAS subscale); DBAS factor III = beliefs about the need for control over insomnia (DBAS subscale) – higher scores indicating more dysfunctional beliefs about sleep; Insomnia symptoms = insomnia symptoms (ISQ) – higher scores indicating more insomnia symptoms.

Table 5 Fit statistics for the multivariate genetic model fitting analyses

	ep	-2LL	df	AIC	Δ -2LL	Δ df	*p*
Model 1: Overall DBAS and symptoms of insomnia							
Saturated	42	11904.61	1638	8628.61	-	-	-
ACE	11	11941.04	1669	8603.04	36.43	31	0.23
Model 2: DBAS Factor I, DBAS Factor II, DBAS Factor III and symptoms of insomnia							
Saturated	132	20732.85	3223	14286.85	-	-	-
ACE Correlated Factors Solution	34	20865.04	3321	14223.04	132.19	98	0.01

Note: All analyses focus on transformed data, outliers deleted with age and sex regressed out. ep = estimated parameters; -2LL = -2*(log likelihood); df = degrees of freedom; $\Delta\chi^2$ = change in chi-square statistic; Δdf = change in degrees of freedom; AIC = Akaike's Information Criterion statistic; Saturated = full model; A = additive genetic; C = shared environmental; E = non-shared environmental. The fit statistics of the ACE respectively the correlated factors solution is relative to the saturated model.