Appendix 1. Questions and scores of SMH

Items	Scores								
	0	1	2	3	4	5	6	7	8
How was your sleep?	—	Very light	Light	Fairly light	Light average	Deep average	Fairly deep	Deep	Very deep
How many times did you wake up?	Not at all	Once	Twice	Three times	Four times	Five times	Six times	More than six times	—
How well did you sleep last night?	—	Very badly	Badly	Fairly badly	Fairly well	well	Very well	—	—
How clear-headed did you feel after getting up this morning?	—	Still very drowsy indeed	Still moderately drowsy	Still slightly drowsy	Fairly clear-headed	Alert	Very alert	—	—
How satisfied were you with last night's sleep?	—	Very unsatisfied	Moderately unsatisfied	Slightly unsatisfied	Fairly satisfied	Completely satisfied	—	—	—
How much difficulty did you have in getting off to sleep last night?	—	None or very little	Some	A lot	Extreme difficulty	—	—	—	—

SMH, St. Mary's Hospital sleep questionnaire

Appendix 2.1. Comparison of PSQI-J answers among the FAS population

Items	Time point	Placebo group (n = 22)					SAC group (n = 19)					Rank sum for Placebo group	Rank sum for SAC group	P
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max			
During the past month, how long (in minutes) has it usually taken you to fall asleep each night? (C2)	Screening	0.0	0.3	1.0	2.0	3.0	0.0	0.0	1.0	1.5	3.0	496.5	364.5	0.361
	12w	0.0	0.0	1.0	2.0	3.0	0.0	0.0	0.0	1.0	2.0	518.0	343.0	0.110
During the past month, how many hours of actual sleep did you get at night? (C3, C4)	Screening	0.0	0.0	1.0	2.0	3.0	0.0	0.5	1.0	2.0	3.0	453.5	407.5	0.829
	12w	0.0	0.0	1.0	1.0	3.0	0.0	0.0	1.0	1.5	2.0	463.0	398.0	0.994
During the past month, how often have you had trouble sleeping because you…														
Cannot get to sleep within 30 minutes (C2)	Screening	0.0	1.3	2.0	3.0	3.0	0.0	0.5	2.0	2.0	3.0	523.0	338.0	0.100
	12w	0.0	1.0	1.5	2.0	3.0	0.0	0.0	1.0	1.0	2.0	556.5	304.5	0.009*
Wake up in the middle of the night or early morning (C5)	Screening	0.0	1.0	1.0	2.8	3.0	0.0	2.0	3.0	3.0	3.0	380.0	481.0	0.023*
	12w	0.0	0.0	1.5	2.8	3.0	0.0	0.5	1.0	2.0	3.0	465.5	395.5	0.991
Have to get up to use the bathroom (C5)	Screening	0.0	0.0	1.0	1.0	3.0	0.0	0.0	2.0	2.5	3.0	403.5	457.5	0.111
	12w	0.0	0.0	1.0	1.0	3.0	0.0	0.0	1.0	2.0	3.0	452.5	408.5	0.826
Cannot breathe comfortably (C5)	Screening	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	2.0	447.0	414.0	0.529
	12w	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	450.5	410.5	0.588
Cough or snore loudly (C5)	Screening	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	1.0	2.0	442.5	418.5	0.571
	12w	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	2.0	478.5	382.5	0.557
Feel too cold (C5)	Screening	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	477.0	384.0	0.627
	12w	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	2.0	460.5	400.5	1.000

PSQI-J, Pittsburgh Sleep Quality Index (Japanese version); FAS, full analysis set; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption. *$P < 0.05$

Appendix 2.1. Comparison of PSQI-J answers among the FAS population (continued)

Items	Time point	Placebo group (n = 22)					SAC group (n = 19)					Rank sum for Placebo group	Rank sum for SAC group	P
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max			
During the past month, how often have you had trouble sleeping because you…														
Feel too hot (C5)	Screening	0.0	0.0	0.5	1.8	3.0	0.0	0.0	1.0	2.0	2.0	454.5	406.5	0.839
	12w	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	1.0	469.5	391.5	0.859
Have bad dreams (C5)	Screening	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.0	427.5	433.5	0.288
	12w	0.0	0.0	0.0	0.8	2.0	0.0	0.0	0.0	0.5	2.0	466.0	395.0	0.900
Have pain (C5)	Screening	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	462.0	399.0	1.000
	12w	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	2.0	438.0	423.0	0.268
During the past month, how would you rate your sleep quality overall? (C1)	Screening	1.0	1.0	2.0	2.0	2.0	0.0	1.5	2.0	2.0	3.0	438.0	423.0	0.484
	12w	0.0	1.0	1.0	2.0	3.0	0.0	1.0	1.0	1.0	1.0	547.0	314.0	0.007*
During the past month, how often have you taken medicine to help you sleep? (C6)	Screening	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	481.0	380.0	0.490
	12w	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	462.0	399.0	1.000
During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity? (C7)	Screening	0.0	0.0	0.5	1.0	2.0	0.0	0.0	0.0	1.0	3.0	455.0	406.0	0.822
	12w	0.0	0.0	0.0	0.8	2.0	0.0	0.0	0.0	0.5	2.0	466.0	395.0	0.900
During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done? (C7)	Screening	0.0	0.0	1.0	1.0	2.0	0.0	0.0	1.0	1.0	2.0	468.0	393.0	0.921
	12w	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	0.0	2.0	504.0	357.0	0.183

PSQI-J, Pittsburgh Sleep Quality Index (Japanese version); FAS, full analysis set; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption. *$P < 0.05$

Appendix 2.2. Comparison of PSQI-J answers among the FAS population with similar sleep quality

Items	Time point	Placebo group (n = 22)					SAC group (n = 19)					Rank sum for Placebo group	Rank sum for SAC group	P
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max			
During the past month, how long (in minutes) has it usually taken you to fall asleep each night? (C2)	Screening	0.0	0.5	1.0	2.0	3.0	0.0	0.0	0.5	1.8	3.0	348.0	213.0	0.374
	12w	0.0	0.0	1.0	2.0	3.0	0.0	0.0	0.0	1.0	2.0	362.5	198.5	0.125
During the past month, how many hours of actual sleep did you get at night? (C3, C4)	Screening	0.0	0.0	1.0	1.5	3.0	0.0	1.0	1.0	2.0	3.0	297.5	263.5	0.328
	12w	0.0	0.0	1.0	1.0	3.0	0.0	0.0	1.0	1.8	2.0	310.0	251.0	0.638
During the past month, how often have you had trouble sleeping because you…														
Cannot get to sleep within 30 minutes (C2)	Screening	1.5	2.0	3.0	3.0	3.0	0.3	1.5	2.8	3.0	3.0	196.5	0.118	0.100
	12w	1.0	1.0	2.0	3.0	3.0	0.0	0.5	1.0	2.0	2.0	179.0	0.025*	0.009*
Wake up in the middle of the night or early morning (C5)	Screening	1.0	1.0	2.0	3.0	3.0	2.0	2.5	3.0	3.0	3.0	301.5	0.017*	0.023*
	12w	0.0	1.0	2.0	3.0	3.0	0.3	1.0	2.0	2.0	3.0	224.0	0.617	0.991
Have to get up to use the bathroom (C5)	Screening	0.0	1.0	1.0	3.0	3.0	0.0	1.5	2.0	3.0	3.0	274.5	0.167	0.111
	12w	0.0	1.0	1.0	3.0	3.0	0.0	0.5	1.0	2.0	3.0	230.5	0.774	0.826
Cannot breathe comfortably (C5)	Screening	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	2.0	224.0	0.496	0.529
	12w	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	1.0	1.0	247.5	0.424	0.588
Cough or snore loudly (C5)	Screening	0.0	0.0	0.0	3.0	3.0	0.0	0.0	0.8	2.0	2.0	247.5	0.744	0.571
	12w	0.0	0.0	0.0	3.0	3.0	0.0	0.0	0.0	1.0	2.0	225.5	0.454	0.557
Feel too cold (C5)	Screening	0.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0	230.0	0.724	0.627
	12w	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	2.0	2.0	240.5	0.811	1.000

PSQI-J, Pittsburgh Sleep Quality Index (Japanese version); FAS, full analysis set; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption. *$P < 0.05$

Appendix 2.2. Comparison of PSQI-J answers among the FAS population with similar sleep quality (continued)

Items	Time point	Placebo group (n = 22)					SAC group (n = 19)					Rank sum for Placebo group	Rank sum for SAC group	P
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max			
During the past month, how often have you had trouble sleeping because you…														
Feel too hot (C5)	Screening	0.0	0.0	1.5	3.0	3.0	0.0	0.5	1.8	2.0	2.0	238.0	1.000	0.839
	12w	0.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	1.0	217.0	0.244	0.859
Have bad dreams (C5)	Screening	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	2.0	238.5	1.000	0.288
	12w	0.0	0.0	0.5	2.0	2.0	0.0	0.0	0.8	2.0	2.0	239.5	1.000	0.900
Have pain (C5)	Screening	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	238.0	1.000	1.000
	12w	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	2.0	250.0	0.561	0.268
During the past month, how would you rate your sleep quality overall? (C1)	Screening	1.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0	2.0	3.0	296.5	264.5	0.308
	12w	0.0	1.0	1.0	2.0	2.0	0.0	0.3	1.0	1.0	1.0	377.0	184.0	0.039*
During the past month, how often have you taken medicine to help you sleep? (C6)	Screening	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	330.0	231.0	1.000
	12w	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	323.0	238.0	1.000
During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity? (C7)	Screening	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	1.0	3.0	318.0	243.0	0.818
	12w	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	0.8	2.0	328.0	233.0	0.912
During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done? (C7)	Screening	0.0	0.0	1.0	1.0	2.0	0.0	0.0	1.0	1.0	2.0	333.0	228.0	0.694
	12w	0.0	0.0	0.0	1.0	2.0	0.0	0.0	0.0	0.0	0.0	372.0	189.0	0.024*

PSQI-J, Pittsburgh Sleep Quality Index (Japanese version); FAS, full analysis set; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption. *$P < 0.05$

Appendix 3.1. Comparison of SMH answers among the FAS population

Items	Time point	Placebo group (n = 22)					SAC group (n = 19)					Group comparison		
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max	Rank sum for Placebo group	Rank sum for SAC group	P
How was your sleep?	Screening	2.0	3.0	4.0	5.0	6.0	1.0	2.0	4.0	5.0	6.0	478.5	382.5	0.674
	12w	2.0	4.0	4.0	6.0	7.0	2.0	4.0	5.0	6.0	7.0	439.0	422.0	0.546
How many times did you wake up?	Screening	1.0	1.0	2.0	3.0	6.0	1.0	2.0	3.0	3.0	3.0	418.0	443.0	0.224
	12w	1.0	1.0	1.0	2.0	4.0	1.0	1.0	1.0	2.0	3.0	462.5	398.5	1.000
How well did you sleep last night?	Screening	1.0	3.0	3.0	4.0	6.0	2.0	3.0	3.0	4.0	5.0	465.5	395.5	0.926
	12w	3.0	3.0	4.0	5.0	6.0	2.0	3.5	5.0	5.0	6.0	438.0	423.0	0.519
How clear-headed did you feel after getting up this morning?	Screening	1.0	3.0	3.0	3.8	4.0	1.0	2.0	3.0	4.0	5.0	463.5	397.5	0.987
	12w	2.0	3.0	4.0	4.0	5.0	2.0	3.0	4.0	5.0	6.0	430.0	431.0	0.387
How satisfied were you with last night's sleep?	Screening	1.0	2.0	3.0	3.0	5.0	1.0	2.5	3.0	3.5	4.0	442.0	419.0	0.580
	12w	1.0	3.0	3.5	4.0	4.0	1.0	3.0	4.0	4.0	5.0	430.5	430.5	0.392
How much difficulty did you have in getting off to sleep last night?	Screening	1.0	1.0	2.0	2.0	4.0	1.0	1.0	1.0	2.0	3.0	492.0	369.0	0.389
	12w	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	4.0	519.0	342.0	0.079

SMH, St. Mary's Hospital sleep questionnaire; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption

Appendix 3.2. Comparison of SMH answers among the FAS population with similar sleep quality

Items	Time point	Placebo group (n = 19)					SAC group (n = 14)					Group comparison		
		Min	Q1	Med	Q3	Max	Min	Q1	Med	Q3	Max	Rank sum for Placebo group	Rank sum for SAC group	P
How was your sleep?	Screening	2.0	3.0	4.0	5.0	6.0	1.0	2.0	3.5	4.8	6.0	345.5	215.5	0.414
	12w	3.0	4.0	5.0	6.0	7.0	2.0	5.0	5.5	6.0	7.0	297.0	264.0	0.341
How many times did you wake up?	Screening	1.0	1.0	2.0	2.5	6.0	1.0	2.0	3.0	3.0	3.0	280.0	281.0	0.100
	12w	1.0	1.0	1.0	2.0	3.0	1.0	1.0	1.0	2.0	3.0	331.0	230.0	0.779
How well did you sleep last night?	Screening	1.0	3.0	3.0	4.0	6.0	2.0	2.3	3.0	4.0	5.0	332.0	229.0	0.737
	12w	3.0	3.0	4.0	5.0	6.0	3.0	4.0	5.0	5.0	6.0	280.5	280.5	0.117
How clear-headed did you feel after getting up this morning?	Screening	1.0	3.0	3.0	3.5	4.0	1.0	2.0	3.0	4.0	5.0	332.5	228.5	0.741
	12w	2.0	3.0	4.0	4.0	5.0	2.0	3.0	4.0	5.0	6.0	290.0	271.0	0.221
How satisfied were you with last night's sleep?	Screening	1.0	2.0	3.0	3.0	5.0	1.0	2.3	3.0	3.8	4.0	314.0	247.0	0.719
	12w	1.0	3.0	3.0	4.0	4.0	1.0	3.3	4.0	4.0	5.0	282.0	279.0	0.106
How much difficulty did you have in getting off to sleep last night?	Screening	1.0	1.0	2.0	2.0	4.0	1.0	1.0	1.5	2.0	3.0	336.5	224.5	0.610
	12w	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	386.0	175.0	0.004*

SMH, St. Mary's Hospital sleep questionnaire; Min, minimum; Med, median; Max, maximum; Q1, first quartile; Q3, third quartile; 12w, 12 weeks after consumption

*P < 0.05