

Appendix-1, Pittsburgh Sleep Quality Assessment Index (PSQI)

INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

During the past month,

1. When have you usually gone to bed? -----
2. How long (in minutes) has it taken you to fall asleep each night? -----
3. What time have you usually gotten up in the morning? -----
4. A. How many hours of actual sleep did you get at night? -----
- B. How many hours were you in bed? -----

5. During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times /week (3)
A. Cannot get to sleep within 30 minutes				
B. Wake up in the middle of the night or early morning				
C. Have to get up to use the bathroom				
D. Cannot breathe comfortably				
E. Cough or snore loudly				
F. Feel too cold				
G. Feel too hot				
H. Have bad dreams				
I. Have pain				
J. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s):				
6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?				
9. During the past month, how would you rate your sleep quality overall?	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)

SCORING

Component 1	# 9 score	C1 _____
Component 2	# 2 score (< 15min = 0, 16-30 min = 1, 31-60 min = 2, > 60 min = 3) + # 5a score (if sum is equal 0 = 0; 1-2 = 1; 3-4 = 2; 5-6 = 3)	C2 _____
Component 3	# 4 score (>7 = 0, 6-7 = 1, 5-6 = 2, < 5 = 3)	C3 _____
Component 4	(total # of hours asleep) / (total # of hours in bed) x 100 [> 85% = 0, 75%-84% = 1, 65%-74 % = 2, < 65% = 3]	C4 _____
Component 5	# sum of scores 5b to 5j (0 = 0; 1-9 = 1; 10-18 = 2; 19 -27 =3)	C5 _____
Component 6	# 6 score	C6 _____
Component 7	# 7 score + # 8score (0 = 0; 1-2 = 1; 3-4 = 2; 5-6 = 3)	C7 _____
Add the seven component scores together _____		Global PSQI _____

A total score of "5" or greater is indicative of poor sleep quality.

Table-1, Demographic variables and gender

Variable	Number (n= 194)	Female (n= 94)	Male (n= 98)	P-value
Age (years)				
60-80	114 (59%)	44 (47%)	70 (71%)	0.001
> 81	78 (41%)	65 (53%)	28 (29%)	
BMI (kg/m²)				
≤ 24.9	106 (55%)	59 (63%)	47 (48%)	0.040
≥ 25	86 (45%)	35 (37%)	51 (52%)	
Memory testing				
Pass	52 (27%)	19 (20%)	33 (34%)	0.037
Fail	140 (73%)	75 (80%)	65 (66%)	
Level of education				
Illiterate	71 (37%)	39 (41%)	32 (33%)	0.201
Elementary school	95 (49%)	44 (47%)	51 (52%)	
Secondary school	23 (12%)	11 (12%)	12 (12%)	
University level	3 (2%)	0	3 (3%)	
Marital Status				
Single	85 (44%)	32 (34%)	53 (54%)	0.458
Married	17 (10%)	3 (3%)	14 (14%)	
Divorced & Widow	90 (46%)	59 (63%)	31 (32%)	
Number of children				
No children	121 (63%)	61 (65%)	60 (52%)	0.331
One or more	71 (37%)	33 (35%)	38 (38%)	
Income per year				
<300 \$ / month	51 (26%)	18 (19%)	33 (34%)	0.008
301-500 \$ /month	82 (42%)	40 (43%)	42 (43%)	
501-1000 \$ / month	50 (26%)	29 (31%)	21 (21%)	
> 1001 \$ / month	9 (6%)	7 (7%)	2 (2%)	
Activity				
Ambulatory	112 (60%)	36 (38%)	76 (68%)	< 0.001
In bed*	72 (40%)	58 (62%)	14 (14%)	
Place of residence				
Urban region	152 (78%)	72 (77%)	80 (82%)	0.391
Rural region	40 (22%)	22 (23%)	18 (18%)	
Occupation				
Un employed	114 (60%)	67 (71%)	47 (48%)	0.001
Employed	78 (40%)	27 (29%)	51 (52%)	
Religion				
Muslim Sunni	125 (64%)	65 (69%)	60 (61%)	0.250
Muslim Shiite	47 (24%)	21 (22%)	26 (27%)	
Druze	14 (8%)	7 (7%)	7 (7%)	
Christian	6 (4%)	1 (1%)	5 (5%)	
Nationality				
Lebanese	180 (93%)	89 (95%)	91 (93%)	0.528
Non-Lebanese	12 (7%)	5 (5%)	7 (7%)	
Smoking habits				

Previous smokers	74 (38%)	23 (24%)	52 (53%)	< 0.001
Previous non-smokers	118 (62%)	71 (76%)	46 (47%)	
Current smokers	58 (30%)	10 (11%)	48 (49%)	< 0.001
Current non-smokers	136 (70%)	84 (89%)	50 (51%)	
Duration of stay in the institution				
1-3 months	8 (4%)	5 (5%)	3 (3%)	
3 months -1 year	21 (11%)	5 (5%)	16 (16%)	0.536
1-3 years	55 (27%)	29 (31%)	26 (27%)	
> 3 years	108 (58%)	55 (59%)	53 (54%)	
Alcohol				
Previously alcoholic	5 (3%)	0	5 (5%)	1
Non-alcoholic	187 (97%)	94 (100%)	93 (95%)	
Previous Hobbies				
Present	81 (43%)	37 (39%)	44 (45%)	0.743
Absent	111 (57%)	57 (61%)	54 (55%)	
Subjective complaint of sleep problem				
Yes	53 (27%)	32 (34%)	21 (21%)	0.052
No	139 (73%)	62 (66%)	77 (79%)	

* Crippled or prefer to stay in bed most of the time

Table-2, Association of demographic variables with sleep disorders defined by a PSQI score \geq 5, presented as the unadjusted Odds ratio (OR) of a sleep disorder with 95% confidence interval:

Variable	Number	PSQI < 5 Total No. 48	PSQI \geq 5 Total No. 144	OR (95% CI)	P-value
Sex					
Male	98	22 (46%)	72 (50%)	1.18 (0.61-2.27)	0.617
Female	94	26 (54%)	72 (50%)		
Age (years)					
60-80	114	26 (54%)	88 (61%)	1.63 (0.43-1.61)	0.611
> 81	78	22 (26%)	56 (39%)		
BMI (kg/m²)					
\leq 24.9	106	24 (50%)	82 (57%)	0.67 (0.35-1.3)	0.240
\geq 25	86	24 (50%)	62 (43%)		
Memory test					
Pass	52	21 (44%)	31 (22%)	2.85 (1.41-5.68)	0.003
Fail	140	27 (56%)	113 (78%)		
Level of education					
Illiterate	71	18 (38%)	53 (37%)		
Elementary school	95	24 (50%)	71 (49%)	1.04 (0.63-1.70)	0.852
Above Secondary school	26	6 (12%)	20 (14%)		
Marital Status					
Single	85	24 (50%)	61 (42%)	1.13 (0.80-1.60)	0.458
Married	17	3 (6%)	14 (10%)		

Divorced & Widow	90	21 (44%)	69 (48%)		
Number of children					
No children	121	39 (81%)	82 (57%)	1.18 (0.63-2.20)	0.595
One Child or more	71	9 (19%)	62 (43%)		
Income per year					
<300 \$ / month	51	15 (31%)	34 (24%)		
301-500 \$ /month	82	22 (46%)	62 (43%)	1.34 (0.86-2.07)	0.188
> 501 \$ / month	59	11 (23%)	48 (33%)		
Activity					
Ambulatory	112	39 (81%)	73 (51%)	4.21 (1.90-9.33)	< 0.005
In bed*	80	9 (19%)	71 (49%)		
Place of residence					
Urban region	152	38 (79%)	114 (79%)	1.00 (0.44-2.23)	1.00
Rural region	40	10 (21%)	30 (21%)		
Previous occupation					
Un employed	114	28 (58%)	96 (67%)	0.972 (0.50-1.88)	0.933
Employed	78	20 (42%)	52 (36%)		
Religion					
Muslim Sunni	125	26 (54%)	99 (69%)	0.53 (0.27-1.04)	0.682
Others	67	22 (46%)	45 (31%)		
Nationality					
Lebanese	180	44 (92%)	136 (94%)	0.83 (0.47-2.51)	0.831
Non-Lebanese	12	4 (8%)	8 (6%)		
Previous smoking					
Smokers	74	19 (40%)	55 (38%)	0.94 (0.48-1.84)	0.864
Non-smoker	118	29 (60%)	89 (62%)		
Current smoking					
Smokers	58	16 (33%)	42 (29%)	0.82 (0.40-1.65)	0.586
Non-smoker	134	32 (67%)	102 (71%)		
Duration of stay in the institution					
≤ 3 years	84	24 (50%)	60 (42%)	1.4 (0.72-2.69)	0.314
> 3 years	108	24 (50%)	84 (58%)		
Previous alcoholics					
Alcoholic	5	2 (4%)	3 (2%)	0.48 (0.079-3.02)	0.442
Non-alcoholic	187	46 (96%)	141 (98%)		
Hobbies					
Previous Hobby	81	24 (50%)	57 (40%)	0.63 (0.33-1.23)	0.181
No previous Hobby	111	24 (50%)	87 (60%)		
Subjective sleep problem					
Yes	53	10 (21%)	43 (30%)	1.16 (0.74-3.53)	0.228
No	139	38 (79%)	101 (70%)		

* Crippled or prefer to stay in bed most of the time

Table-2, Association of chronic diseases with sleep disorders defined by a PSQI score ≥ 5 , presented as the unadjusted Odds ratio (OR) of a sleep disorder with 95% confidence interval

Variable	Number Total No. 192	PSQI < 5 Total No. 48	PSQI ≥ 5 Total No. 144	OR (95% CI)	P-value
Hyperlipidemia					
Yes	85 (44%)	22 (46%)	63 (44%)	0.91 (0.47-1.77)	0.801
No	107 (56%)	26 (55%)	81 (56%)		
Dementia					
Yes	77 (40%)	24 (50%)	53 (37%)	0.58 (0.30-1.12)	0.108
No	115 (60%)	24 (50%)	91 (64%)		
Alzheimer disease					
Yes	64 (33%)	10 (21%)	54 (38%)	2.28 (1.05-4.94)	0.037
No	128 (67%)	38 (79%)	90 (62%)		
Hypertension					
Yes	62 (32%)	17 (35%)	45 (31%)	0.83 (0.41-1.65)	0.593
No	130 (68%)	31 (65%)	99 (68%)		
Schizophrenia					
Yes	56 (29%)	20 (42%)	36 (25%)	0.46 (0.23-0.92)	0.030
No	136 (71%)	28 (56%)	108 (75%)		
Diabetes mellitus					
Yes	51 (27%)	15 (31%)	36 (25%)	0.73 (0.35-1.50)	0.397
No	141 (73%)	33 (69%)	108 (75%)		
Depression					
Yes	33 (17%)	9 (19%)	24 (17%)	0.58 (0.30-1.12)	0.108
No	159 (82%)	39 (81%)	120 (63%)		
Osteoporosis					
Yes	28 (15%)	6 (13%)	22 (15%)	1.26 (0.47-3.32)	0.637
No	164 (75%)	42 (87%)	122 (85%)		
Anemia					
Yes	27 (14%)	4 (8%)	23 (16%)	2.09 (0.68-6.38)	0.195
No	165 (86%)	44 (92%)	121 (84%)		
Joint problems					
Yes	14 (7%)	5 (10%)	9 (6%)	0.57 (0.18-1.80)	0.341
No	178 (93%)	43 (90%)	135 (94%)		
Epilepsy					
Yes	12 (6%)	2 (4%)	10 (7%)	1.71 (0.36-8.12)	0.496
No	180 (94%)	46 (96%)	134 (93%)		
Cardiac problems					
Yes	9 (5%)	2 (4%)	7 (5%)	1.17 (0.23-5.85)	0.844
No	184 (95%)	46 (96%)	137 (95%)		
Gastrointestinal problems					
Yes	6 (3%)	0	6 (4%)	-----	1
No	186 (97%)	48 (100%)	138 (96%)		
Anxiety					
Yes	4 (2%)	0	4 (3%)	-----	1

No	188 (98%)	48 (100%)	140 (97%)		
Parkinson					
Yes	5 (3%)	1 (2%)	4 (3%)	-----	1
No	187 (97%)	47 (98%)	140 (97%)		
Dizziness					
Yes	3 (2%)	1 (2%)	2 (1%)	-----	1
No	189 (98%)	47 (98%)	142 (99%)		

Table-3 Association of medications with sleep disorders defined by a PSQI score ≥ 5 , presented as the unadjusted Odds ratio (OR) of a sleep disorder with 95% confidence interval

Variable	Number Total No. 192	PSQI < 5 Total No. 48	PSQI ≥ 5 Total No. 144	Odds Ratio (95% Confidence Interval)	P-value
Calcium/Vitamin D					
Yes	178 (93%)	42 (88%)	136 (94%)	2.42 (0.79-7.39)	0.118
No	14 (7%)	6 (12%)	8 (6%)		
Proton pump inhibitors					
Yes	102 (53%)	20 (42%)	82 (57%)	1.85 (0.96-3.59)	0.066
No	90 (47%)	28 (58%)	62 (46%)		
Statin					
Yes	91 (47%)	22 (46%)	69 (48%)	1.08 (0.56-2.09)	0.802
No	101 (53%)	26 (54%)	75 (52%)		
Aspirin					
Yes	82 (43%)	17 (35%)	65 (45%)	1.50 (0.76-2.95)	0.24
NO	110 (57%)	31 (65%)	79 (55%)		
Antipsychotics					
Yes	73 (38%)	20 (42%)	53 (37%)	0.81 (0.41-1.58)	0.548
No	119 (62%)	28 (28%)	91 (63%)		
Beta blockers					
Yes	65 (34%)	16 (33%)	49 (34%)	1.03 (0.51-2.06)	0.930
No	127 (66%)	32 (67%)	95 (66%)		
Anxiolytics					
Yes	53 (28%)	15 (31%)	38 (26%)	0.78 (0.38-1.61)	0.515
NO	139 (72%)	33 (69%)	106 (74%)		
Multivitamins					
Yes	46 (24%)	12 (25%)	34 (24%)	0.92 (0.43-1.97)	0.845
NO	146 (76%)	36 (75%)	110 (76%)		
ACE inhibitors					
Yes	35 (18%)	10 (21%)	25 (17%)	0.79 (0.35-1.81)	0.594
NO	157 (82%)	38 (79%)	119 (83%)		
Antidepressants					
Yes	34 (18%)	8 (17%)	26 (18%)	1.10 (0.46-2.62)	0.827
No	158 (82%)	40 (83%)	118 (82%)		
Diuretics					
Yes	30 (16%)	7 (15%)	23 (16%)	1.11 (0.44-2.78)	0.819
No	162 (84%)	41 (85%)	121 (84%)		
Anti-Parkinson Agents					
Yes	26 (8%)	6 (13%)	20 (14%)	1.12 (0.42-3.00)	0.808
No	166 (92%)	42 (87%)	124 (86%)		
Anticonvulsants					
Yes	23 (12%)	4 (8%)	19 (13%)	1.67 (0.53-5.18)	0.373
No	169 (88%)	44 (92%)	125 (87%)		
Ca channel blockers					
Yes	21 (6%)	6 (13%)	15 (10%)	0.81 (0.29-2.23)	0.689

No	171 (94%)	42 (87%)	129 (90%)		
Iron					
Yes	19 (10%)	4 (8%)	15 (10%)	1.27 (0.40-4.05)	0.676
No	173 (90%)	44 (92%)	129 (90%)		
Protein supplement					
Yes	15 (8%)	1 (2%)	14 (10%)	5.06 (0.64-39.5)	0.122
No	177 (92%)	47 (98%)	130 (90%)		
Angiotensin receptor blocker					
Yes	16 (8%)	7 (15%)	9 (6%)	0.39 (0.13-1.13)	0.079
No	176 (92%)	41 (85%)	135 (94%)		
Warfarin					
Yes	7 (4%)	1 (2%)	6 (4%)	2.04 (0.24-17.4)	0.513
No	185 (96%)	47 (98%)	138 (96%)		

Table-5. Multivariate analysis using a stepwise logistic regression model

Variable	Odds Ratio	95% Confidence Interval	p-value
Bedridden or wheelchair	3.47	1.53- 7.88	0.003
Use of PPI	2.02	0.99- 4.10	0.052
Fail on memory tests	2.39	0.14- 5.03	0.022

