

Supplementary Online Content

Wesselius HM, van den Ende ES, Alisma J, et al. Quality and Quantity of Sleep and Factors

Associated With Sleep Disturbance in Hospitalized Patients. *JAMA Intern Med.* Published online July

16, 2018. doi:10.1001/jamainternmed.2018.2669

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This supplementary material has been provided by the authors to give readers additional information about their work.

TRANSLATED QUESTIONNAIRE INSOMNIA STUDY

Case Report Form

Name hospital:

Name researcher:

Function researcher:

Data filling in questionnaire:

Answers questions recorded by: <i>(mark right answer)</i>	Patient / Researcher
Time filling in questionnaire <i>(hours:minutes)</i> :

Admission data:

Admission date <i>(dd-mm-yyyy)</i>-.....-201...
Ward type <i>(mark right answer)</i>	Acute medical ward / Regular ward
Admission specialty	
Room type <i>(..-person)</i> <i>(mark right answer)</i>	1 / 2 / 3 / 4 / 5 / 6 / >6
Underwent operation during admission <i>(mark right answer)</i>	Yes / No

Sleep questionnaire

Thank you for participating in this study. Below you will find questions about your **sleep of the previous night in the hospital** and questions about your **sleep at home the month prior to hospital admission**. When asked for a time, please use 24-hour notation i.e. from 00:00 until 23:59. Try to answer every question and please make an estimate if you don't know an exact answer.

General questions

- 1a. I am years of age (*record your age*).
 1b. I am a woman / man (*mark the right answer*).
 1c. I was informed about: (*mark every applicable answer*)
- Participation to this study is voluntary,
 - Participation is free-standing from my treatment in the hospital, and
 - I can withdraw from participation in the study at every moment without any consequence

Questions about your sleep

- 2a. What time did you try to go to sleep last night?(hours:minutes)
 2b. What time did you usually try to go to sleep at home the month prior to admission?
(hours:minutes)
 3a. How long did it take you to fall asleep last night?(hours:minutes)
 3b. How long did it usually take you to fall asleep at home the month prior to admission?
(hours:minutes)

3c. If falling asleep lasted longer than at home, what factor(s) was contributing to that?
 Please mark in the table below what is applicable multiple answers can be given:

1. Kept awake by hospital staff	
2. Noises of medical equipment	
3. Noises of other patients	
4. Noises of hospital staff	
5. Light	
6. Movement to other room or ward	
7. Uncomfortable bed or pillow	
8. Pain	
9. Shortness of breath	
10. Anxiety	
11. Worrying about your disease	
12. Other, namely:	

- 4a. How many times did you wake up last night, not counting your final awakening? times
 4b. In total, how long did these awakenings last? hours and minutes
 4c. What woke you last night, not counting your final awakening?
 Please mark in the table below what is applicable multiple answers can be given:

1. Woken up by hospital staff	
2. Noises of medical equipment	
3. Noises of other patients	
4. Noises of hospital staff	
5. Light	
6. Movement to other room or ward	
7. Uncomfortable bed or pillow	
8. Pain	
9. Shortness of breath	
10. Anxiety	
11. Worrying about your disease	
12. Other, namely:	

4d. How many times did you usually wake up during the night at home the month prior to admission, not counting your final awakening?times

4e. In total, how long did these awakenings approximately last? hours and minutes

5a. What time was your final awakening this morning? (hours:minutes)

5b. What woke you up this morning? *Mark one of the two possibilities:*

- Spontaneously
- Other reason, namely: *Please mark in the table below what is applicable multiple answers can be given:*

1. Self-set alarm clock	
2. Woken up by hospital staff	
3. Noises of medical equipment	
4. Noises of other patients	
5. Noises of hospital staff	
6. Light	
7. Movement to other room or ward	
8. Uncomfortable bed or pillow	
9. Pain	
10. Shortness of breath	
11. Anxiety	
12. Worrying about your disease	
13. Other, namely:	

5c. What time was your final awakening usually at home the month prior to admission?
.....(hours:minutes)

6a. For how long did you try to get back to sleep after your final awakening this morning?
..... hours and minutes

6b. For how long did you usually try to get back to sleep after your final awakening at home the month prior to admission?
..... hours and minutes

7a. Did you nap during daytime yesterday? *Mark one of two answers:* Yes No

7b. Did you usually nap during daytime at home the month prior to admission? *Mark one of two answers:*
Yes No

8a. Did you use sleep medication last night? *Mark one of two answers:* Yes No

When yes, please note name and dose of the sleep medication below

Name sleep medication: Dose:

8b. Did you usually take sleep medication at home the month prior to admission? Yes No

When yes, please note name and dose of the sleep medication below

Name sleep medication: Dose:

9a. How would you rate the quality of your sleep of the previous night in the hospital?
'Quality of sleep is if you feel you slept well or poor'.

Very poor Poor Fair Good Very good

9b. How would you rate the usual quality of your sleep at home the month prior to admission?
'Quality of sleep is if you feel you slept well or poor'.

Very poor Poor Fair Good Very good

Please react to the statements below by marking one of the boxes.

10a. I am satisfied with my sleep of previous night.

Not at all A little Somewhat Quite a bit Very much

10b. I am satisfied with how I slept at home the month prior to admission.

Not at all A little Somewhat Quite a bit Very much

11a. Tonight's sleep was refreshing.

Not at all A little Somewhat Quite a bit Very much

11b. My sleep at home the month prior to admission was refreshing.

Not at all A little Somewhat Quite a bit Very much

12a. Tonight's sleep was restless.

Not at all A little Somewhat Quite a bit Very much

12b. At home the month prior to admission, my sleep was restless.

Not at all A little Somewhat Quite a bit Very much

13a. Last night I had difficulty falling asleep.

Not at all A little Somewhat Quite a bit Very much

13b. At home the month prior to admission I had difficulty falling asleep.

Not at all A little Somewhat Quite a bit Very much

14a. This morning I felt lousy when I woke up.

Not at all A little Somewhat Quite a bit Very much

14b. At home the month prior to admission I felt lousy when waking up.

Not at all A little Somewhat Quite a bit Very much

Thank you for filling in the questionnaire. Would you please check if you answered all the questions?

SUPPLEMENTARY TABLES

Supplementary table 1. Overview of use sleep medication

Supplementary table 1: Overview of use sleep medication		
	Home (n=335)	Hospital (n=539)
Benzodiazepine	189 (56%)	264 (49%)
Melatonin	12 (4%)	6 (1%)
Antidepressant	10 (3%)	10 (2%)
Antipsychotic	3 (1%)	6 (1%)
Antiepileptic	1 (0%)	1 (0%)
Antihistamine	0 (0%)	8 (2%)
Opioid	8 (2%)	42 (8%)
Paracetamol	39 (12%)	61 (11%)
Other	18 (5%)	14 (3%)
Unknown by patient	55 (16%)	127 (24%)

Of 2005 patients, 335 (17%) reported the use of sleep medication at home and 539 (26%) in the hospital. This table shows frequencies and proportions (n, %) of the different types of sleep medication that was reported by patients within these groups.
Besides conventional sleep medication, patients indicated medicine like Paracetamol and opioids as medication to promote sleep.

Supplementary table 2. Characteristics of patients included and excluded in analysis on subjective sleep quantity

Supplementary table 2: Characteristics of patients included and excluded in analysis on subjective sleep quantity		
	Included patients	Excluded patients
Gender		
Male	657 (47%)	260 (48%)
Female	734 (53%)	284 (52%)
Age		
<35	94 (7%)	23 (4%)
36-50	166 (12%)	50 (9%)
51-65	382 (27%)	143 (25%)
66-80	533 (38%)	232 (41%)
81+	234 (17%)	118 (21%)
Length of stay		
1 day	246 (20%)	113 (22%)
2 days	213 (17%)	91 (18%)
3 days	106 (8%)	34 (7%)
4+ days	693 (55%)	277 (54%)
Number of patients in room		
1	372 (26%)	132 (23%)
2	369 (26%)	145 (25%)
3	116 (8%)	47 (8%)
4	540 (38%)	234 (41%)
5	4 (0%)	5 (1%)
≥ 6	14 (1%)	1 (0%)
Specialty		
Non-surgical unit	1110 (82%)	426 (74%)
Surgical unit	246 (18%)	115 (20%)
Surgery		
Yes	319 (23%)	132 (23%)
No	1093 (77%)	437 (77%)
Sleep medication		
Yes	383 (27%)	156 (27%)
No	1044 (73%)	422 (73%)
Assistance filling out questionnaire		
Yes	403 (30%)	108 (19%)
No	953 (70%)	440 (76%)

n (%) of included or excluded patients within this specific variable

Supplementary table 3. Distribution of answers to PROMIS sleep quality items

Supplementary table 3: Distribution of answers to PROMIS sleep quality items							
	Very poor (0)	Poor (1)	Fair (2)	Good (3)	Very good (4)	Median (IQR)	Difference (CI)
My sleep quality was...							
Home (n=1958)	2 %	9 %	25 %	50 %	14 %	3 (2-3)	0.58 (0.52 - 0.64)
Hospital (n=1966)	8 %	19 %	35 %	31 %	6 %	2 (1-3)	p<.001
	Not at all (0)	A little (1)	Somewhat (2)	Quite a bit (3)	Very much (4)	Median (IQR)	Difference (CI)
I was satisfied with my sleep.							
Home (n=1960)	7 %	10 %	17 %	48 %	18 %	3 (2-3)	0.60 (0.53 - 0.67)
Hospital (n=1961)	19 %	14 %	23 %	35 %	9 %	2 (1-3)	p<.001
My sleep was refreshing.							
Home (n=1961)	9 %	11 %	22 %	46 %	12 %	3 (2-3)	0.63 (0.56 - 0.70)
Hospital (n=1969)	22 %	19 %	24 %	30 %	5 %	2 (1-3)	p<.001
My sleep was restless.							
Home (n=1951)	49 %	21 %	16 %	12 %	3 %	1 (0-2)	-0.45 (-0.52 --0.38)
Hospital (n=1952)	35 %	22 %	17 %	18 %	9 %	1 (0-3)	p<.001
I had difficulty falling asleep.							
Home (n=1957)	56 %	20 %	13 %	89 %	3 %	0 (0-1)	-0.51 (-0.59 --0.44)
Hospital (n=1958)	40 %	21 %	13 %	15 %	11 %	1 (0-3)	p<.001
I felt lousy when I woke up.							
Home (n=1952)	69 %	14 %	9 %	6 %	2 %	0 (0-1)	-0.24 (-0.30 --0.18)
Hospital (n=1956)	57 %	20 %	10 %	9 %	4 %	0 (0-1)	p<.001

Every question is answered using a 5-point scale so a median and inter-quartile range (IQR) could be calculated. The 'difference' is the result of the mean at home minus hospital score.

Supplementary table 4. Differences in raw summary Sleep Disturbance scores between groups

	Hospital	Home
Supplementary table 4: Differences in raw summary Sleep Disturbance scores between groups		
Gender		
Male	9.5 (9.1-9.9)	6.0 (5.7-6.4)
Female	10.0 (9.6-10.4)	7.4 (7.1-7.8)
Age		
<35	11.6 (10.6-12.7)	6.9 (6.0-7.8)
36-50	11.0 (10.2-11.8)	7.0 (6.2-7.7)
51-65	10.0 (9.5-10.6)	6.7 (6.3-7.2)
66-80	9.2 (8.8-9.6)	6.6 (6.2-7.0)
81+	9.1 (8.5-9.8)	6.6 (6.0-7.1)
Specialty		
Non-surgical unit	9.6 (9.3-9.9)	6.8 (6.5-7.1)
Surgical unit	10.5 (9.9-11.2)	6.3 (5.7-6.9)
Operation		
Yes	10.4 (9.8-10.9)	6.5 (6.0-7.0)
No	9.6 (9.3-9.9)	6.8 (6.4-7.1)
Sleep medication		
Yes	10.5 (10.0-11.0)	9.2 (8.7-9.8)
No	9.5 (9.2-9.8)	6.2 (5.9-6.5)
Assistance filling out questionnaire		
Yes	9.0 (9.7-10.3)	6.5 (6.0-7.0)
No	10.0 (8.5-9.5)	6.8 (6.5-7.1)
<p>Mean and (95% CI) of raw summary PROMIS Sleep Disturbance scores (0-24) in different groups. A higher score indicates more sleep disturbance.</p>		

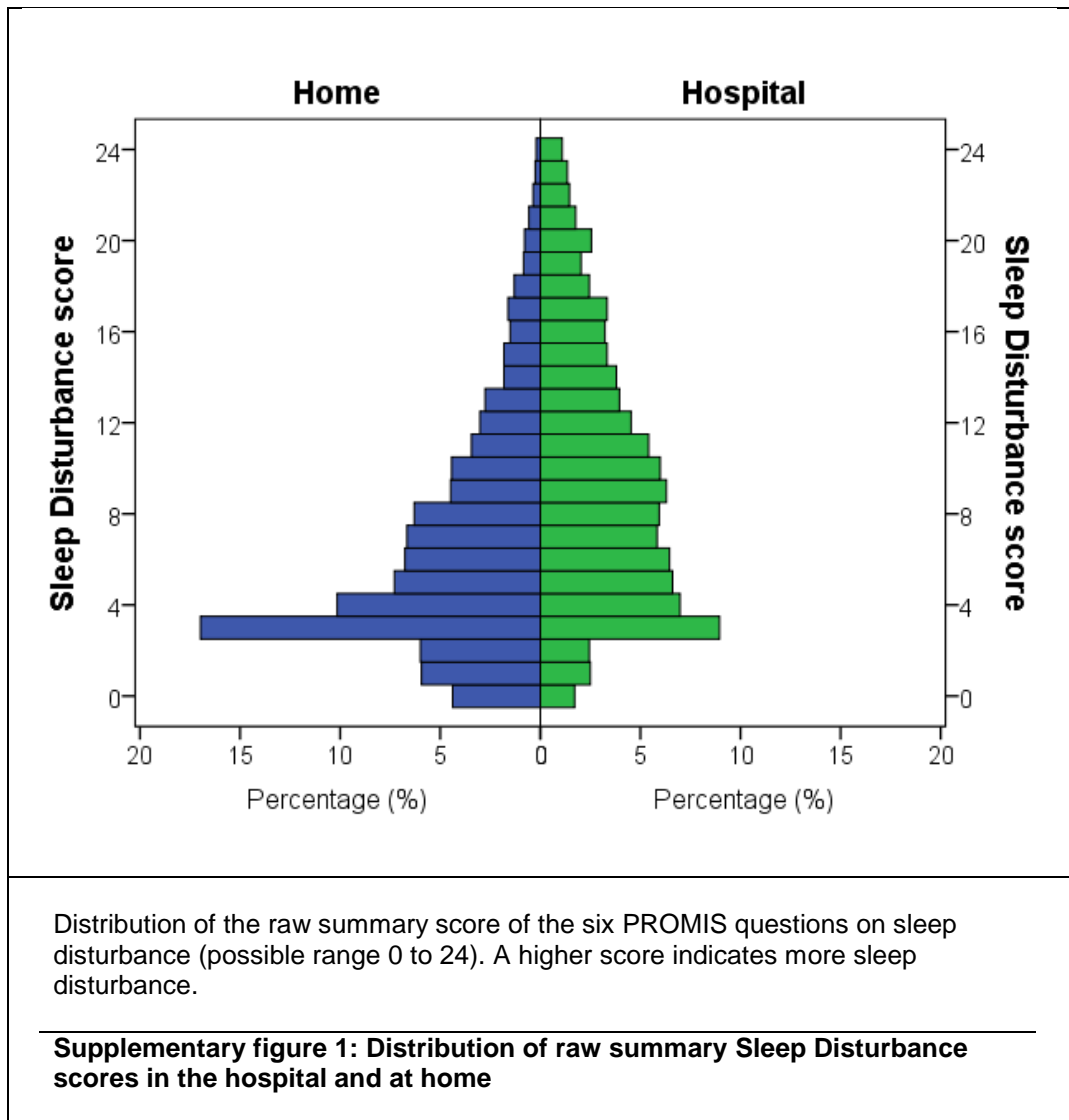
Supplementary table 5. Listing of all disturbing factors

Supplementary table 5: Listing of all disturbing factors		
SLEEP ONSET LATENCY (n=1976)	NOCTURNAL AWAKENINGS (n=2004)	FINAL AWAKENING (n=1910)
Noise of other patients (24%)	Other answer (36%)	Woken by hospital staff (36%)
Pain (20%)	Noise of other patients (23%)	Other answer (12%)
Noise of hospital equipment (19%)	Woken by hospital staff (20%)	Noise of other patients (11%)
Worrying about illness (17%)	Pain (20%)	Pain (11 %)
Other answer (17%)	Noise of hospital equipment (18%)	Lights (10%)
Uncomfortable bed/pillow (16%)	Uncomfortable bed/pillow (14%)	Noise of hospital staff (9%)
Woken by hospital staff (16%)	Lights (11%)	Noise of hospital equipment (7%)
Lights (15%)	Worrying about illness (10%)	Uncomfortable bed/pillow (6%)
Noise of hospital staff (11%)	Dyspnoea (10%)	Dyspnoea (5%)
Dyspnoea (11%)	Noise of hospital staff (10%)	Worrying about illness (5%)
Anxiety (6%)	Anxiety (5%)	Private alarm (4%)
Transfer (2%)	Transfer (2%)	Anxiety (3%)
		Transfer (1%)

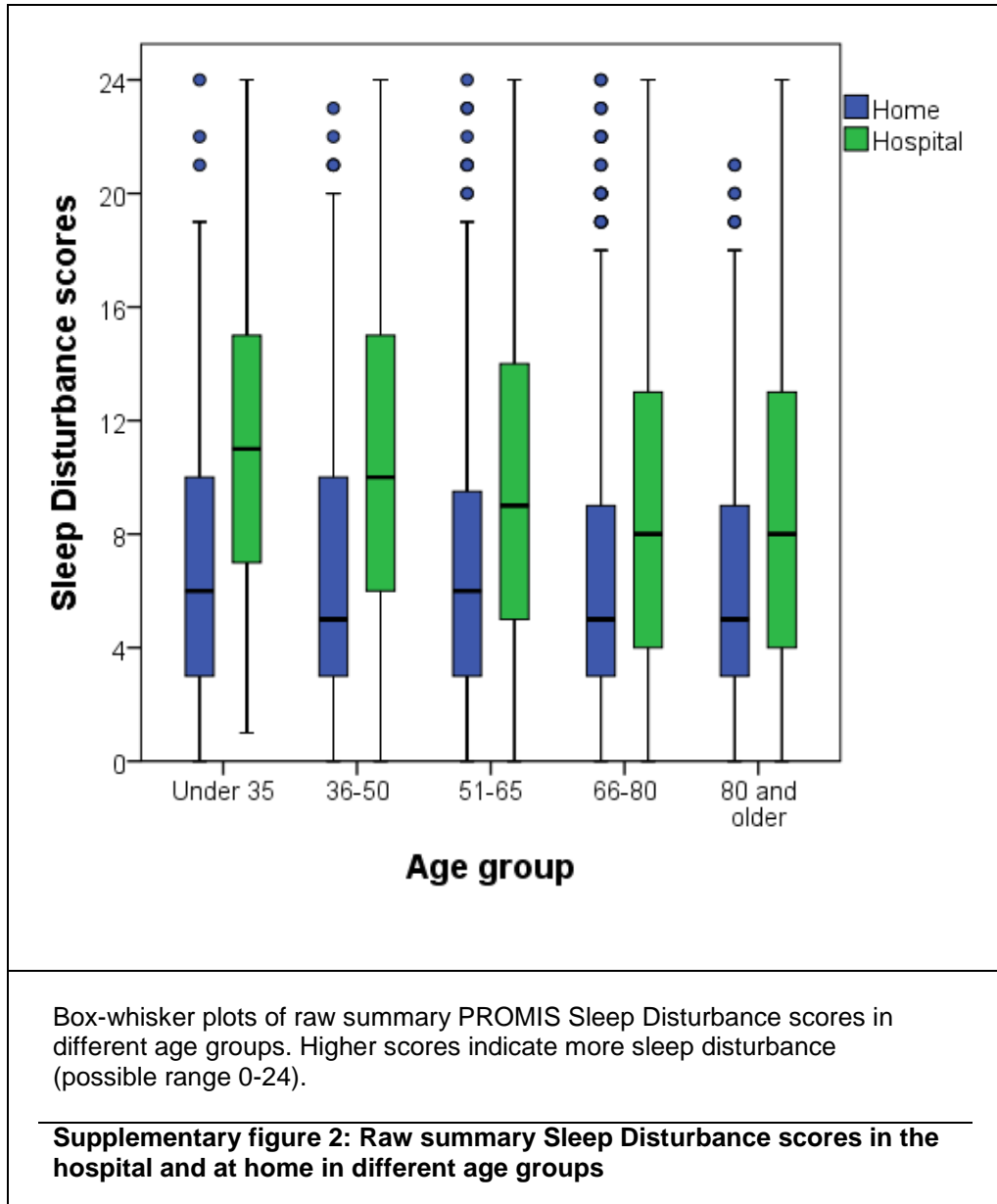
(%) Percentage of patients that suffered from this disturbing factor.

SUPPLEMENTARY FIGURES

Supplementary figure 1. Distribution of raw summary Sleep Disturbance scores in the hospital and at home



Supplementary figure 2. Raw summary Sleep Disturbance scores in the hospital and at home in different age groups



Supplementary figure 3. Overview of disturbing factors (before, during, after sleep onset)

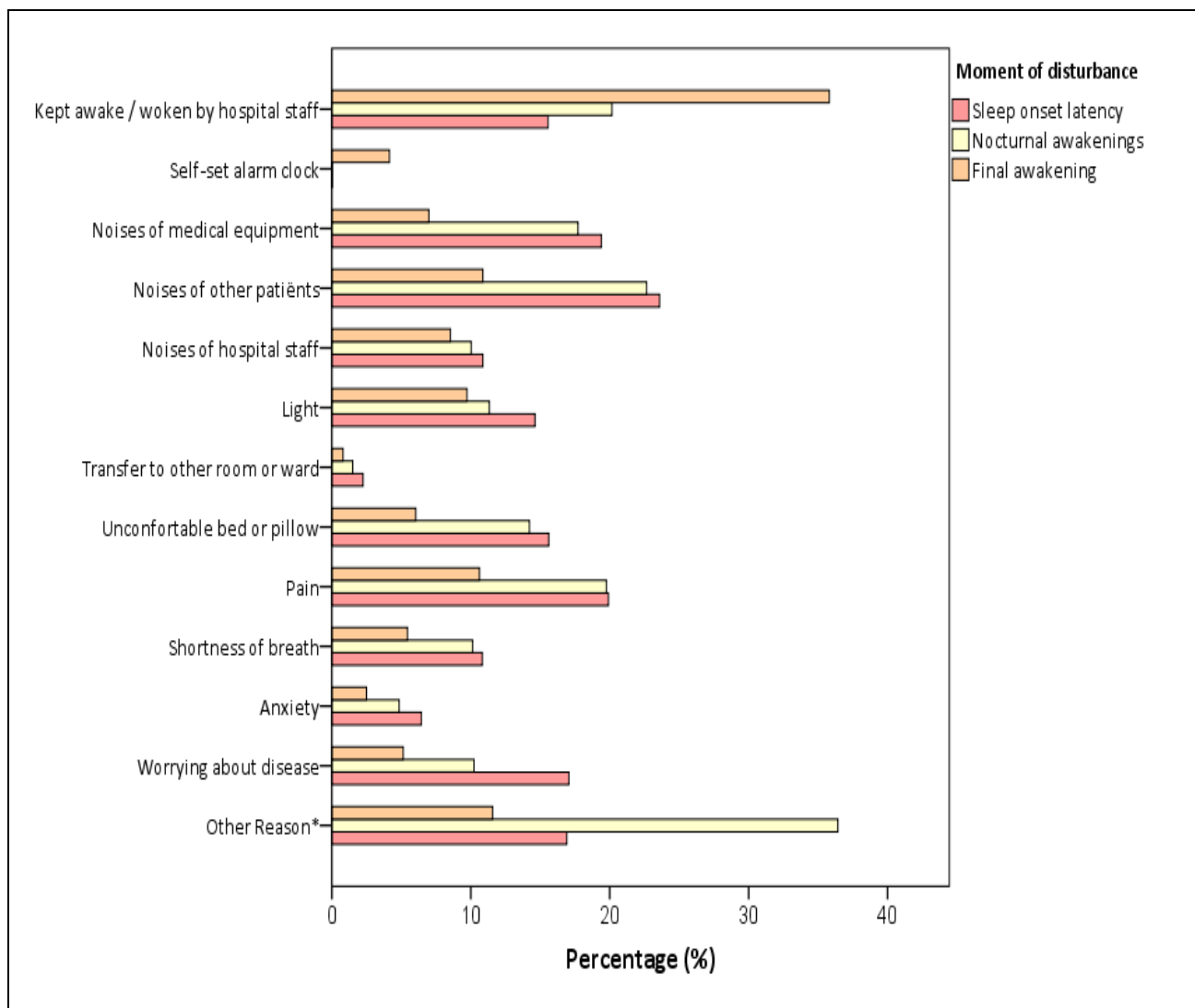


Figure shows the proportion of all patients (N=2005) who have chosen this specific reason.
 * Other reasons: toilet visits, room temperature, no fresh air, uncomfortable sleeping posture, negative emotions, nausea, unknown environment, drains/IV lines/ urinary catheters, coughing, pruritus, noise in general, too many hours of rest during daytime.

Supplementary figure 3: Overview of disturbing factors (before, during, after sleep onset)

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