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ORIGINAL ARTICLE

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ABSTRACT

Background: In occupational therapy, while several studies have focussed on occupational balance, few have investigated it in the context of sleep.

Aims: The aim of this study was to investigate the associations between sleep and occupational balance among women.

Material and methods: In total, 157 women responded to the Occupational Balance Questionnaire and Karolinska Sleep Questionnaire. Linear regression was used to analyse data.

Results: The median score for occupational balance was 12 (interquartile range [IQR] 9), while that for sleep was 86 (IQR 16). Sleep and sleepiness fatigue were significantly associated ($p < 0.1$) with satisfaction with the number of occupations during a regular week. Difficulties awakening and snoring disorders were significantly associated ($p < 0.1$) with balance with physical, social, intellectual, and restful occupations.

Conclusions: The majority of participants slept well and had a good sleep quality. There is an association between occupational balance and sleep. In particular, aspects related to the number of occupations, adequate time to perform them and the time spent recovering and sleeping were associated with good sleep quality. Balance among physical, social, intellectual, and restful occupations was associated with difficulties awakening and snoring.

Significance: Our results support the need for occupational therapists to focus on occupational balance, to improve women's sleep.

Introduction

In occupational therapy, an extensive amount of research has focussed on occupational balance [1]; however, there is a lack of research on the association between occupational balance and sleep. Sleep is often referred to as a physiological need that needs to be met for health maintenance, and is implicitly included in a person's basic needs [2]. An adult sleeps for one-third of his/her life. Sleep is the occupation with the greatest impact on health [3], and is a part of everyday life [4].

Occupational balance

The concept of occupational balance investigates how different types of occupations, i.e. work, home and family chores, leisure, rest and sleep interact in the human life puzzle [5]. Occupational balance has been defined as the presence of the right amount and variation between occupations in the occupational repertoire [6]. Furthermore, it is important for humans to be able to organize and participate in occupations in a manner congruent with their values and needs [7]. Occupational balance is associated with health and well-being [8–12] and people who experience occupational imbalance, i.e. being over-occupied or under-occupied, have a greater risk of stress and stress-related disorders [13]. Stress-related disorders are the most commonly cited cause of sick leave in Sweden [14], and the proportion of people taking stress-related sick leave had increased among women aged 30–49 years between 2010 and 2015 [15]. Women in the aforementioned age range often have young children; the presence of children living at home is associated with lower occupational balance [15].

Sleep

Sleep is essential for survival as it affects physiological functioning, such as in terms of mood, behaviour and

energy [16,17]. Sleep is a prerequisite for alertness and for the body and nervous system to recover from daily experiences [18]. Sleep quality depends on a combination of the number of previous sleep and waking hours, the level of external stimuli and the circadian biological clock [19]. Sleep is also essential for memory function and storage [19,20]. When sleep is disturbed by external or internal stimuli, its quality decreases and it does not contribute to the recovery or the process of one's memories and experiences during the day [18,21]. Even a 24-hour sleep deprivation period can negatively impact participation in and the performance quality of everyday occupations. Sleep quality is defined by the amount of sleep time, sleep efficiency, total sleep duration and percentage of deep sleep [19] and the lack of quality sleep is often associated with work, family and leisure-related demands [22–24]. Other factors that may also affect sleep quality negatively include stress, dissatisfaction with work, high blood pressure and pain syndromes resulting from musculoskeletal problems or neurological diseases [25,26]. People who sleep poorly often more frequently take sick leave and have an inferior physical and mental health status compared to people who sleep well [27]. Sleep is essential for survival and considered an occupational domain [17], with 7–9 h of sleep per night recommended [3]. While sleep contributes to physical and mental well-being, occupational balance and sleep have not been researched together previously [28]. Accordingly, we aimed to investigate occupational balance and sleep, and the associations between them among women.

Material and methods

Design

In this cross-sectional study, Swedish women were asked to answer a web survey. Descriptive statistics and linear regressions were applied to investigate the associations between occupational balance and sleep, sleep quality, difficulties awakening, snoring as well as sleepiness fatigue.

Sample

The survey was conducted using a sample of convenience. The inclusion criteria of the study were women aged 30–55 year and those who had the ability to read and write Swedish. The exclusion criteria of the study were presence of sickness or treatment for a diagnosed degenerative disease (diseases such as Multiple sclerosis and Parkinson's disease include fatigue and

sleep problems) [16]. The age range 30–55 years was chosen considering that women in this category are the likeliest to take sick leave due to stress-related disorders, as well as due to the fact that they have a greater number of occupations to balance, such as work, home and family chores, leisure, rest and sleep [5]. The participants were recruited *via* the social media platform Facebook. A total of 232 web surveys were completed; 47 participants did not meet the inclusion criteria age and 28 questionnaires were incomplete. A total of 157 participants were finally included.

Procedure

Two self-assessment forms in Swedish the Occupational Balance Questionnaire (OBQ) [29] and Karolinska Sleep Questionnaire (KSQ) [21] were used. Permission was received by the Stress Research Institute at Stockholm University [30] to use the KSQ. As an introduction to the web survey, an information letter describing the background and aim of the study, contact information of the authors and information regarding consent, which entails voluntary participation and the possibility of discontinuing participation, was provided to participants. Informed consent was obtained from all the participants and international recommendations for research ethics were followed [30].

Participants

A total of 157 women with a mean age of 41 years (range 31–55 years) participated in the study. The participants' demographic characteristics are presented in Table 1. Overall, 151 (96%) of the participants were residents of Sweden and the remainder lived abroad. Participants had between 0–5 children in their households and 64 (41%) had one or more children aged 6 years or younger in the household.

Data collection

Data were collected at the start of 2018 *via* social media. The questionnaire was distributed through Survey Monkey and comprised items on sociodemographic data such as living situation, living, area of residence, number of children in the household and number of children aged under 6 years in the household and profession, as well as items contained in the OBQ [29] and KSQ [21]. The OBQ was developed in Swedish and has good content validity, test–retest

Table 1. Participants' demographics and characteristics (n = 157).

	n (%)
Living situation	
Alone	28 (18)
Together with someone	129 (82)
Living[a]	
Apartment	56 (36)
House	99 (64)
Area of residence[b]	
Sweden	151 (97)
Europa	5 (3)
Number of children in the household	
0	47 (30)
1	32 (20)
2	57 (36)
3	18 (12)
4	1 (1)
5	2 (1)
Children aged under 6 years in the household	
yes	64 (41)
No	93 (59)
Occupation	
Work	135 (86)
Studies	11 (7)
Unemployed	2 (1)
On parental leave/house wife	9 (6)

[a]Living: two missing value.
[b]Area of residence: one missing value.

reliability and internal consistency, with no observed floor-to-ceiling effect [29]. Furthermore, the OBQ11 version has shown good construct validity [31]. The OBQ includes 11 items and four response alternatives (0–3); strongly disagree 0; disagree 1; agree 2; strongly agree 3. The OBQ11 has a total score of 0–33 and the higher the total score, the higher the level of occupational balance. The KSQ is predominantly used in Scandinavia [32]. The KSQ measures a wide range of dimensions in subjective sleep quality, during the past 3 months [21]. It includes nine items, with the first item including 18 statements regarding sleep [28]. The KSQ uses a response scale of 1–6 with the options: always 1; mostly 2; often 3; sometimes 4; rarely [28] 5; and never 6. Additional questions pertaining to bedtime routines are included. The KSQ has a total score of 0–108 points, with high scores indicating good sleep. This questionnaire is designed to report on four different indices [21]: (1) the sleep quality index, which includes: (a) difficulty falling asleep; (c) repeated awakening with difficulty going back to sleep: (i) awakening too early and (j) disturbed/restless sleep. (2) The difficulties awakening index: (b) difficulties waking up; (h) not rested upon awakening and m) feeling exhausted on awakening. (3) The snoring disorders index: (d) heavy snoring; (e) gasping for breath during sleep and (f) breathing cessations during sleep. (4) The sleepiness fatigue index: (n) sleepy during work; (o) sleepy during

leisure time and (q) involuntary sleep periods during leisure time [28].

Data analysis

The participants' sociodemographic characteristics are summarized in Table 1. Descriptive statistics were used to compile the distribution measurements and percentage distribution of participants in terms of occupational balance and sleep, sleep quality and difficulties awakening, snoring disorders and sleepiness fatigue.

Linear regression analysis was conducted to explore the variables within occupational balance that were associated with the total scores for sleep, and the total scores on the subscales for sleep quality, difficulties awakening, snoring disorders and sleepiness fatigue. Simple linear regression analyses of 14 variables were initially conducted separately for sleep and the four outcomes of the subscale scores for sleep quality, difficulties awakening, snoring disorders and sleepiness fatigue. Variables with $p < 0.1$ in the simple linear regression analysis were included in the multiple regression analysis with backward elimination ($p < 0.1$). The final multiple regression analysis included variables with $p < 0.1$. Residual analysis was conducted on the final models and showed the linear regression analysis was appropriate for use. Statistical Packages for the Social Sciences was used for the data analysis and $p < .01$ was set as the level of significance.

Results

Women's occupational balance

The results for occupational balance, as presented in Table 2, showed a total study score of a median of 12 points (interquartile range [IQR] 9, variation 0–32 points). The median was 1 across all items (Table 2).

Women's sleep

The results of the KSQ are presented in Table 3. Almost all (155 [99%]) participants had a high score, higher than 50% of the total score of 108 points, indicating good sleep. The total score for sleep was a median of 86 points (IQR 16, range 50–104 points).

During workdays, the majority of the participants (137 [88%]) went to bed between 21.00 and 23.00, and 155 (99%) in the time interval between 20:00 and 01:00. A majority (128 [84%]) of the women woke up at 05.00–07.00 and 155 (99%) at 04.15–08.30. During

Table 2. Results of the Occupational Balance Questionnaire.

Occupational balance items	Total study group ($n = 157$)
	Median (IQR)
Having sufficient to do during a regular week	1 (1)
Balance between doing things for myself and for others	1 (1)
Time for doing the things I want	1 (1)
Balance between work, home, family, leisure, rest and sleep	1 (1)
Enough time for obligatory occupations	1 (1)
Balance between physical, social, mental and restful occupations	1 (1)
Satisfaction with how time is spent in everyday life	1 (1)
Satisfaction with the number of occupations during a regular week	1 (1)
Balance between obligatory and voluntary occupations	1 (1)
Balance between energy-giving and energy-taking occupations	1 (1)
Satisfaction with the time spent in rest, recovery and sleep	1 (2)
Total scores	12 (9)

Scale 0–3; strongly disagree 0; disagree 1; agree 2; strongly agree 3.
IQR: interquartile range.

Table 3. Description of sleep based on the Karolinska Sleep Questionnaire.

	Total study group ($n = 157$)
Have you had the feeling of the following symptoms/troubles in the last 3 months?	Median (IQR)
a) Difficulty falling asleep	5.0 (1)
b) Difficulty waking up	5.0 (2.5)
c) Repeated awakening with difficulty going back to sleep	5.0 (1)
d) Heavy snoring	6.0 (1.5)
e) Gasping for breath during sleep	6.0 (0)
f) Breathing cessations during sleep	6.0 (0)
g) Nightmares	5.0 (0)
h) Not rested upon awakening	4.0 (3)
i) Awakening too early	4.0 (2)
j) Disturbed/restless sleep	4.0 (2)
k) Involuntary twitches in the legs that interfere with sleep	6.0 (1)
l) Too little sleep (at least two hours too little, per main sleep)	4.0 (2)
m) Feeling exhausted on awakening	4.0 (2)
n) Sleepy during work	4.0 (1)
o) Sleepy during leisure time	4.0 (2)
p) Involuntary sleep periods during work	6.0 (1)
q) Involuntary sleep periods during leisure time	5.0 (1.5)
r) Need to fight sleep to stay awake	5.0 (1)
Total scores Sleep	86.0 (16)
Total scores Sleep quality index (a; c; i; j)	18 (5)
Total scores Difficulties awakening index (b; h; m)	13.0 (5)
Total scores Snoring disorders index (d; e; f)	17.0 (2)
Total scores Sleepiness fatigue Index (n; o; p; q; r)	24.0 (4)

Scale 1–6: always 1; mostly 2; often 3; sometimes 4; rarely 5; never 6.
IQR: interquartile range.

weekends, the majority of the participants (110 [71%]) went to bed at 22.00–00.00 and 155 (99%) at 21:00–02:00, and a majority of the participants (108 [71%]) woke up at 5:30–13:00. Two participants worked at night and slept during the day. More than half of the participants (95 [61%]) fell asleep within less than 15 min after turning off the lights both on weekdays and weekends (range 2 min–2 h). Half of the participants (84 [54%]) indicated the need for 8 (average 7.7 h) hours of sleep. About half of the participants (73 [47%]) rested for more than half an hour up to 2 h, 52 (34%) reported that they rested for between 10 and 30 min, while 24 (15%) did not rest during the day. Half of the participants (73 [47%]) reported that they slept quite well. About a third of the participants (57 [37%]) reported that they had slightly insufficient sleep. Most participants (64 [41%]) reported themselves as being more of evening persons, 54 (35%) reported themselves as being more of morning persons and 37 (24%) as being neither morning nor evening persons.

Associations between occupational balance and sleep

Simple linear regression analyses of the 14 initial variables resulted in 11 variables that showed a significant association with sleep, sleep quality and difficulties awakening. Three variables showed significant associations with snoring disorders and 12 variables with sleepiness fatigue ($p < 0.1$) (Table 4). The variables selected for the final multiple linear regression models

Table 4. Variables included in the simple linear regression analysis.

Independent variables included in the simple regression analysis	Sleep, p-value	Sleep quality, p-value	Difficulties awakening, p-value	Snoring disorders, p-value	Sleepiness fatigue, p-value
Living situation (living alone; living with someone)	0.897	0.946	0.332	0.680	0.353
Children aged under 6 years in the household (yes; no)	0.308	0.265	0.459	0.152	0.965
Age	0.445	0.558	0.125	0.031	0.017
Occupational balance total scores[a]	<0.001	<0.001	<0.001	0.110	<0.001
Having sufficient to do during a regular week	<0.001	0.005	0.002	0.420	0.002
Balance between doing things for myself and for others	<0.001	<0.001	<0.001	0.102	<0.001
Time for doing things I want	<0.001	0.006	<0.001	0.475	<0.001
Balance between work, home, family, leisure, rest and sleep	<0.001	<0.001	<0.001	0.108	<0.001
Enough time for obligatory occupations	<0.001	<0.001	<0.001	0.046	<0.001
Balance between physical, social, mental and restful occupations	<0.001	0.001	<0.001	0.029	<0.001
Satisfaction with how time is spent in everyday life	<0.001	<0.001	<0.001	0.274	<0.001
Satisfaction with the number of occupations during a regular week	<0.001	0.001	0.001	0.529	<0.001
Balance between obligatory and voluntary occupations	<0.001	<0.001	<0.001	0.412	<0.001
Balance between energy-giving and energy-taking occupations	<0.001	<0.001	<0.001	0.105	<0.001
Satisfaction with the time spent in rest, recovery and sleep	<0.001	<0.001	<0.001	0.714	<0.001

Significance level < 0.1.
[a]Not included in the multiple regression analysis.

were identified through multiple linear regression analysis with backward elimination ($p < 0.1$). The variables which were significantly associated ($p < 0.1$) to sleep were as follows: *Satisfied with the amount of time that I spend relaxing, recovering, and sleeping, Enough time for obligatory occupations and Satisfaction with the number of occupations during a regular week* (Adjusted $R^2 = 35\%$, F-ratio = 28). The variables which were significantly associated ($p < 0.1$) with sleep quality were; *Satisfaction with the time spent in rest, recovery and sleep* (Adjusted $R^2 = 23\%$, F-ratio = 47). The variables which were significantly associated ($p < 0.1$) with difficulties to awakening were as follows: *Satisfaction with the time spent in rest, recovery and sleep* and *Balance between physical, social, mental and restful occupations* (Adjusted $R^2 = 22\%$, F-ratio = 23). The variables which were significantly associated ($p < 0.1$) with snoring disorders were: *Balance between physical, social, mental and restful occupations and Age* (Adjusted $R^2 = 6\%$, F-ratio = 6). The variables which were significantly associated ($p < 0.1$) with Sleepiness fatigue were; *Satisfaction with the time spent in rest, recovery and sleep, Satisfaction with the number of occupations during a regular week and Enough time for obligatory occupations* (Adjusted $R^2 = 22\%$, F-ratio = 23) (Table 5).

Discussion

Principal results

In this study, the total OBQ score was a median of 12 (IQR 9, variation 0–32). The total occupational balance score was associated with overall sleep, sleep quality, difficulties awakening and sleepiness fatigue,

but not with snoring disorder. Furthermore, the result showed the presence of associations between different aspects of occupational balance and sleep. The most important aspect of occupational balance with respect to sleep was 'Satisfaction with the time spent in rest, recovery and sleep', and this was associated with good overall sleep and sleep quality, and the absence of difficulties awakening and sleepiness fatigue. Further, associations between the item 'Enough time spent on obligatory occupations' and good overall sleep as well as the absence of sleepiness fatigue were observed. Additionally, we also noted associations between 'Balance among my physical, social, mental and restful occupations' and the absence of difficulties awakening and snoring disorder.

Results in relation to other studies

The median of the total occupational balance score in this study was 12. The OBQ11 is a rather new measure and does not have a specific cut-off score, making it difficult to assess whether a group's occupational balance is high or low. The OBQ11 was used in a previous study that assessed university teachers' occupational balance [33], in which the median of the total occupational balance score was 11 [33].

The results of this study show that occupational balance is associated with overall sleep, sleep quality, difficulties awakening and sleepiness fatigue, confirming the results of other studies, which showed that sleep disorders can be a result of work-family conflict [34–36]. To the best of our knowledge, no current studies have focussed on identifying the aspects of occupational balance that are associated with the different aspects of sleep. This study showed that 'Satisfaction with the time spent in rest, recovery and

Table 5. Associations between occupational balance items and total score for sleep, sleep quality, difficulties awakening, snoring disorders and sleepiness fatigue.

Variables	B	95% CI	p-value
Model: sleep[a]			
Constant/intercept	71.7	68.8 to 74.8	
Satisfaction with the time spent in rest, recovery and sleep	5.30	3.37 to 7.23	<0.001
Enough time for obligatory occupations	2.61	0.39 to 4.83	0.022
Satisfaction with the number of occupations during a regular week	2.98	−0.06 to 4.02	0.057
Model: sleep quality[b]			
Constant/Intercept	14.25	13.32 to 15.17	
Satisfaction with the time spent in rest, recovery and sleep	2.25	1.61 to 2.90	<0.001
Model: difficulties awakening[c]			
Constant/intercept	9.85	9.04 to 10.67	
Satisfaction with the time spent in rest, recovery and sleep	1.30	0.70 to 1.90	<0.001
Balance between physical, social, mental and restful occupations	0.77	0.09 to 1.45	0.027
Model: snoring disorders[d]			
Constant/intercept	18.26	16.56 to 19.96	
Balance between physical, social, mental and restful occupations	−0.53	0.13 to 0.94	0.010
Age	−0.54	−0.10 to −0.01	0.011
Model: sleepiness fatigue[e]			
Constant/intercept	19.60	18.44 to 20.76	
Satisfaction with the time spent in rest, recovery and sleep	1.08	.35 to 1.80	0.004
Satisfaction with the number of occupations during a regular week	0.11	.35 to 1.88	0.005
Enough time for obligatory occupations	0.98	.15 to 1.81	0.021

Significance level < 0.1.
CI: confidence interval.
[a]Sleep: adjusted R^2 = 35%, F-ratio = 28.
[b]Sleep quality: adjusted R^2 = 23%, F-ratio = 47.
[c]Difficulties to awakening: adjusted R^2 = 22%, F-ratio = 23.
[d]Snoring disorders: adjusted R^2 = 6%, F-ratio = 6.
[e]Sleepiness fatigue: adjusted R^2 = 18%, F-ratio = 25.

sleep' was associated with good overall sleep as well as good sleep quality, and the absence of difficulties awakening and sleepiness fatigue. Meyer [37] described the importance of rest and sleep in the occupational pattern as a counterweight to work and play. Rest, recovery and sleep are necessary between periods of engagement in occupations to avoid overload, negative stress and stress-related disorders, and achieve a healthy balance in everyday life [2,13].

Furthermore, 'Enough time for obligatory occupations', 'Satisfaction with the number of occupations during a regular week' and 'Balance among my physical, social, mental and restful occupations' were associated with different aspects of sleep. One of the symptoms of stress is sleep disorders [38]. A possible interpretation of the above-mentioned results of this study could be that the participants were over-occupied and experienced stress which, according to Wilcock and Hocking [2], can lead to occupational imbalance. In occupational therapy theories, sleep [4,28] as well as and rest are core occupations in everyday life [39].

The interpretation of our findings pertaining to sleep and the quality of sleep and their relation to the patterns of daily occupations must be considered within the limitation of time-use data. Nevertheless, it is relevant to discuss the findings from a 24-hour perspective. The variables that were significantly associated with sleep were 'Satisfied with the time spent in rest, recovery and sleep', 'Enough time for obligatory occupations' and 'Satisfied with the number of occupations during a regular week'. The duration of sleep is often similar in different groups of women, at an average of at least 8 h. However, data from Statistics Sweden [40] show that women (aged 20–44 years) with children under the age of 7 years work 3 h and 15 min more each day than women without children. Many women work (paid and unpaid) 12–13 h in total during each weekday. Cohabiting mothers spend, on average, 2 h more every weekday with their children than fathers. In families with only girls, mothers spend 3 h more than fathers with their children. Mothers use the Internet and spend time engaged in different kinds of screen-related activities for an average of 2 h a day, which is significantly lower than the value observed among women without children. With shifts in the patterns of daily occupations in modern life, social media use has become the most popular daily occupation for most people and there is growing concern that screen-time overuse may affect sleep [41]. However, in this study, half of the participants reported that they had sufficient sleep; only a third of the participants reported an insufficiency. Half of the participants (84 [54%]) indicated the need for 8 h of sleep (average 7.7 h). In a study sample of adult Canadian women aged 18–64 years, 7.2 h was the average sleep duration [42] while in the Swedish Time Use survey 2010 [40] at least 8 h of sleep was

the reported average for women; women with children had slightly shorter sleep durations. In the accurate examination of the patterns of daily occupations, time-use diaries may be helpful [43]. After all, to acknowledge how time is spent during 24 h can be the first step in making lifestyle changes to achieve better sleep.

Practical implication and further studies

Promoting better occupational balance may be associated with improved sleep and better subjective health. The use of the OBQ11 to map occupational balance and identify the changes that need to be made may help improve sleep. Occupational therapists could benefit from the use of a client-centred and holistic approach to assist individuals improve their sleeping habit including the bedroom environment. Studies have shown that strategies such as focussing on the bedroom environment, i.e. providing adaptive equipment to modifying the environment may improve sleep, for example, a quiet and dark sleep environment [26].

Interventions including the use of time-geographical diaries [44] when collecting data may assist clients in becoming aware of the daily occupation patterns that may affect sleep. In terms of practical implications, occupational therapists may suggest the use of the OBQ11 together with time-use diaries for the setting of realistic and useful goals together with their clients. Both the patterns of daily occupations and occupational balance have been shown to be related to health and well-being [9,45]. Eklund et al. [6] suggest patterns of daily occupations as objective and occupational balance as subjective result from an interaction between personal preferences and environmental influences. Although the indicators used to reflect the patterns of daily occupations most often are based on subjective data derived from time-use diaries, it is possible to count the minutes and hours allocated to various occupations. The two constructs may complement each other in terms of the provision of principles for occupational therapy interventions. The association between sleep and occupational balance can add further dimensions to occupational therapy. According to Tester and Jackson Foss [17], occupational therapists should consider routinely screening for factors affecting their clients' sleep. How this can be implemented in clinical work should be investigated in future research.

Methodological considerations

All the residual analyses of the multiple regression models indicated that the use of multiple linear regression on the data was appropriate. The models generated in the multiple linear regression using backward eliminations were stable if forward elimination was used instead, with the exception of one variable in the sleep model: 'Balance between activities that give me energy versus those that drain my energy' was included instead of 'Satisfied with the number of activities that I take part in' using forward elimination and one variable in the sleepiness fatigue model: 'Balance among my physical, social, intellectual and restful activities' was used instead of 'Enough time to do the things that I must do' when using forward elimination. A limitation of this study is its cross-sectional design, which makes it impossible to establish the causal direction. Consequently, while good occupational balance can predict good sleep, opposite results may also be possible. Future longitudinal studies, therefore, need to be conducted in this context.

Conclusion

A majority of the participants slept well and had a good sleep quality.

There is an association between occupational balance and sleep. In particular, aspects related to the number of occupations, adequate time to perform them and the time spent recovering and sleeping were associated with good sleep quality. Balance among physical, social, intellectual and restful activities was associated with difficulties awakening and snoring.

Our results support the need for occupational therapists to focus on occupational balance, to improve women's sleep.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

[1] Wagman P, Håkansson C, Jonsson H. Occupational balance: a scoping review of current research and identified knowledge gaps. J Occup Sci. 2015;22(2):160–169.

[2] Wilcock AA, Hocking C. An occupational perspective of health. Thorofare (NJ): Slack Incorporated; 2015.

[3] Watson NF, Badr MS, Belenky G, et al. Recommended amount of sleep for a healthy adult: a joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society. Sleep. 2015;38(6):843–844.

[4] Roehrs T, Roth T. Sleep disorders: an overview. Clin Cornerstone. 2004;6(1):S6–S16.

[5] Pierce DE. Occupational science for occupational therapy. Thorofare (NJ): Slack Incorporated; 2014.

[6] Wagman P, Håkansson C, Björklund A. Occupational balance as used in occupational therapy: a concept analysis. Scand J Occup Ther. 2012; 19(4):322–327.

[7] Eklund M, Orban K, Argentzell E, et al. The linkage between patterns of daily occupations and occupational balance: applications within occupational science and occupational therapy practice. Scand J Occup Ther. 2017;24(1):41–56.

[8] Wagman P, Håkansson C. Exploring occupational balance in adults in Sweden. Scand J Occup Ther. 2014;21(6):415–420.

[9] Håkansson C, Lissner L, Björkelund C, et al. Engagement in patterns of daily occupations and perceived health among women of working age. Scand J Occup Ther. 2009;16(2):110–117.

[10] Håkansson C, Björkelund C, Eklund M. Associations between women's subjective perceptions of daily occupations and life satisfaction, and the role of perceived control. Aust Occup Ther J. 2011;58(6):397–404.

[11] Erlandsson L-K, Björkelund C, Lissner L, et al. Women's perceived frequency of disturbing interruptions and its relationship to self-rated health and satisfaction with life as a whole. Stress Health. 2009;26(3):225–232.

[12] Håkansson C, Milevi S, Eek F, et al. Occupational balance, work and life satisfaction in working cohabiting parents in Sweden. Scand J Public Health. 2019;47(3):366–374.

[13] Håkansson C, Ahlborg G. Occupational imbalance and the role of perceived stress in predicting stress-related disorders. Scand J Occup Ther. 2018;25(4):278–287.

[14] Försäkringskassan. Sjukfrånvarons utveckling 2016. [The development of sickness absence 2016]. Social Insurance Report; 2016.

[15] Insurance Agency. Mental illness, Short Analysis; 2016 [cited 2018 May 27]. Available from: https://www.forsakringskassan.se/wps/wcm/connect/ 41903408-e87d-4e5e-8f7f-90275dafe6ad/korta_analyser_2016_2.pdf?MOD=AJPERES

[16] Norrving B. Clinical neuroscience [Klinisk neurovetenskap]. Stockholm: Liber; 2015.

[17] Tester NJ, Jackson Foss J. Sleep as an occupational need. Am J Occup Ther. 2018;72:1–4.

[18] Hwang P, Lundberg I, Smedler A-C, et al. Grunderna i vår tids psykologi [The basics of today's psychology.]. Stockholm: Natur & Kultur; 2012.

[19] Theorell T. Psykosocial miljö och stress [Psychosocial environment and stress.]. Lund: Studentlitteratur; 2012.

[20] Söderström M. Sömn: sov bättre med kognitiv beteendeterapi [Sleep: Sleep better with cognitive behavioral therapy.]. Stockholm: Viva; 2007.

[21] Nordin M, Åkerstedt T, Nordin S. Psychometric evaluation and normative data for the Karolinska Sleep Questionnaire. Sleep Biol Rhythms. 2013;11(4):216–226.

[22] Lallukka T, Ferrie JE, Kivimäki M, et al. Conflicts between work and family life and subsequent sleep problems among employees from Finland, Britain, and Japan. Intj Behav Med. 2014;21(2):310–318.

[23] Salo P, Ala-Mursula L, Rod NH, et al. Work time control and sleep disturbances: prospective cohort study of Finnish public sector employees. Sleep. 2014;37(7):1217–1225.

[24] Burgard SA, Ailshire JA. Gender and time for sleep among U.S. adults. Am Sociol Rev. 2013;78(1):51–69.

[25] Gutman SA, Gregory KA, Sadlier-Brown MM, et al. Comparative effectiveness of three occupational therapy sleep interventions: a randomized controlled study. OTJR: Occup Participation Health. 2017;37:5–13.

[26] Ho ECM, Siu A. Occupational therapy practice in sleep management: a review of conceptual models and research evidence. Occup Ther Int. 2018;2018:1–12.

[27] Doi Y, Minowa M, Tango T. Impact and correlates of poor sleep quality in Japanese white-collar employees. Sleep. 2003;26(4):467–471.

[28] Stress Research Institute. Sleep and awakening. Stockholm: Stockholm University; [cited 2018 May 24]. Available from: https://www.stressforskning.su.se/forskning/sömn-och-vakenhet

[29] Wagman P, Håkansson C. Introducing the Occupational Balance Questionnaire (OBQ). Scand J Occup Ther. 2014;21(3):227–231.

[30] World Medical Association. World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. Bull World Health Organ. 2001;79:373–374.

[31] Håkansson C, Wagman P, Hagell P. Construct validity of a revised version of the Occupational Balance Questionnaire. Scand J Occup Ther. 2019. DOI:10.1080/11038128.2019.1660801

[32] Øyane NM, Ursin R, Pallesen S, et al. Self-reported seasonality is associated with complaints of sleep problems and deficient sleep duration: the Hordaland Health Study. J Sleep Res. 2008;17(1):63–72.

[33] Eliasson K, Sörensen L. Self-perceived occupational balance and work-related stress among university lecture [Bachelor thesis]. Luleå: Luleå University; 2018.

[34] Zhang Y, Punnett L, Nannini A. Work-family conflict, sleep, and mental health of nursing assistants working in nursing homes. Workplace Health Saf. 2017;65(7):295–303.

[35] Camerino D, Sandri M, Sartori S, et al. Shiftwork, work-family conflict among Italian nurses, and prevention efficacy. Chronobiol Int. 2010;27(5): 1105–1123.

[36] Hämmig O, Bauer G. Work-life imbalance and mental health among male and female employees in Switzerland. Int J Public Health. 2009;54(2):88–95.

[37] Meyer A. The philosophy of occupation therapy. Reprinted from the Archives of Occupational Therapy, Volume 1, pp. 1-10, 1922. Am J Occup Ther. 2014;31:639–642.

[38] Otsuka Y, Kaneita Y, Itani O, et al. Relationship between stress coping and sleep disorders among the general Japanese population: a nationwide representative survey. Sleep Med. 2017;37:38–45.

[39] Occupational therapy practice framework: domain and process (3rd edition). Am J Occup Ther. 2017; 68:S1–S48.

[40] Statistics Sweden. The Swedish Time Use Survey 2010/11. Örebro: Statistics Sweden; 2011 [cited 2019 Feb 18]. Available from: https://www.scb.se/hitta-statistik/sok/?query=Time+Use+Survey+2010%2F11&lang=sv

[41] Statistics Sweden. Use of computers and the internet by private persons in 2016; 2016 [cited 2019 Dec 17]. Available from: https://www.scb.se/contentassets/3e727f0d3a434dc482dd3f79529d0ef5/le0108_2016a01_br_it01br1601.pdf

[42] Chaput JP, Wong SL, Michau I. Duration and quality of sleep among Canadians aged 18 to 79. Health Reports. Health Rep. 2017;28(9):28–33.

[43] Orban K, Edberg A-K, Erlandsson L-K. Using a time-geographical diary method in order to facilitate reflections on changes in patterns of daily occupations. Scand J Occup Ther. 2012;19(3):249–259.

[44] Orban K, Edberg A-K, Thorngren-Jerneck K, et al. Changes in parents' time use and its relationship to child obesity. Phys Occup Ther Pediatr. 2014;34(1): 44–61.