

Effect of Sleep Quality on Psychiatric Symptoms and Life Quality in Newspaper Couriers

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ABSTRACT

Introduction: Working at unusual hours has been found to be related to sleep problems, psychiatric symptoms, and low quality of life. This study aimed to investigate the effect of sleep quality on psychiatric symptoms and the quality of life in newspaper couriers who permanently wake up at early morning hours.

Methods: Thirty-five newspaper couriers who worked for a media company in Ankara and 35 healthy individuals who worked at usual hours and who were matched according to age, gender, and work duration were included in the study. All individuals were evaluated using the demographic forms, Symptom Checklist (SCL)-90-R, Pittsburgh Sleep Quality Index (PSQI), and Short Form-36 (SF-36).

Results: The somatization subscale of SCL-90-R and the sleep duration sub-component scores of PSQI were significantly higher and the physical role functioning domain score of SF-36 was significantly lower in newspaper couriers compared with the scores in healthy

individuals. There were significantly positive correlations between the PSQI total and sub-component scores and the SCL-90-R subscale and global symptom index scores. There were significantly negative correlations between the PSQI total and sub-component scores and the SF-36 domain scores.

Conclusion: This study demonstrates that waking up permanently at early morning hours may be related to sleep disturbances, psychiatric symptoms, and low quality of life. Measures to increase sleep quality in individuals working at unusual hours may improve their mental health and quality of life. Future studies should investigate the effects of interventions toward sleep disturbances on mental health and quality of life in different occupational groups.

Keywords: Sleep quality, psychiatric symptoms, quality of life, shift work, permanently early wake

INTRODUCTION

Working at unusual hours is quite prevalent in industrialized countries. Health professionals, security workers, factory laborers, and people working in the transportation and entertainment sectors work at night permanently or in shifts. Shift work might lead to various physical or psychiatric health problems because of being outside of usual working and social life and disruption of the sleep–wake cycle (1).

The sleep–wake cycle is regulated by the endogenous circadian rhythm. In a normal sleep–wake cycle, the endogenous circadian rhythm provides awakesness during the day and sleepiness at night (2). However, in shift work, the sleep–wake cycle is disturbed because the working hours are not synchronized with the endogenous circadian rhythm (3,4). Therefore, sleep problems are prevalent among shift workers (5,6). Difficulties in falling asleep, maintaining sleep, and sleepiness during the day are more frequently observed among individuals who work at night (1,7). Sleepiness during the day has been demonstrated to be related to being awake at early hours in shift workers (8,9).

Health problems, such as cerebrovascular diseases, coronary artery diseases, hypertension, diabetes, and cancer, have been found to be more prevalent in shift workers than in individuals working during the daytime (10,11,12). Shift work is an important reason for chronic stress and fatigue (13). Psychiatric problems, mainly depression and anxiety disorders, are more frequently observed in shift workers (2,14,15). Impaired normal sleep/wake rhythms have been reported to result in depression and anxiety disorders in shift workers (16).

Shift work impairs the quality of life because of sleepiness, fatigue, physical symptoms, and inability to maintain a social life (17,18). Shift workers have fewer social activities than day workers (19).

Several studies have evidenced the negative effects of shift work on psychiatric health and the quality of life. However, there is a paucity of study regarding the effects of permanent early working hours. Although some occupations do not require night or shift work, they necessitate permanent working at early hours. Newspaper distribution is such an occupation. This study aimed to determine sleep quality and its effects on psychiatric health and the quality of life in newspaper couriers.



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METHODS

Subjects

This study included newspaper couriers who work for a media company in Ankara. Among newspaper couriers in this media company, individuals who did not agree to participate in the study, had a physical or psychiatric disease, or were absent during the study period were excluded. Before the study, the media company was informed regarding the study and their permission was obtained for the study. The study was approved by the Ethics Committee of the Turgut Ozal University Medical Faculty in November 8, 2013, with approval number 99950669/1131. The control group comprised male day workers who were age, education, and income matched with the study group. The registration criteria for the study group were to be aged >18 years, to have worked for at least 6 months in the present job, to have no major physical or psychiatric health problems, and to voluntarily participate in the study. The registration criteria for the control group were to be aged >18 years, to have worked for at least 6 months in the present job, to have no major physical or psychiatric health problems, and to voluntarily participate in the study. Finally, a total of 35 newspaper couriers were registered for the study group and 35 day workers for the control group. All the individuals in the study and control groups were informed regarding the study, and they gave written informed consent to voluntarily participate in the study.

Instruments

Demographic information form: This form was prepared by the researchers and was filled out by the subjects. It comprised questions regarding sociodemographic features, such as age, educational level, and marital status, and information regarding working hours, daily sleeping hours, and occupational life.

Symptom Checklist (SCL)-90-R: This is a screening questionnaire that is used for evaluating psychiatric symptoms and an individual's present stress and distress levels. It was developed by Derogatis (20). It is a self-administered Likert-type scale that comprises 90 items and 10 subscales. The subscales are somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and additional items. The validity and reliability study of this checklist in Turkey was performed by Dag (21). The mean score of all items gives the global symptom index and indicates the distress level that is related to psychiatric symptoms. The mean scores of the subscales can also be separately calculated. Each score of the subscales and global symptom indices can range from 0 to 4 (22).

Short Form-36 (SF-36): This is a self-administered scale, which is widely used to measure the quality of life. It was developed to measure the quality of life in patients who have physical illnesses; however, it can also be successfully used in healthy individuals and patients who have psychiatric diseases. SF-36 includes 36 items and surveys eight domains of health, such as physical functionality, physical role limitations, pain, general health, vitality, social functionality, emotional role limitations, and mental health (22). Ware and Sherbourne (23) developed the scale, and Kocyigit et al. (24) performed its Turkish validity and reliability study.

Pittsburg Sleep Quality Index (PSQI): This was developed by Buysse et al. (25) to evaluate sleep quality. Its Turkish validity and reliability study was performed by Agargun et al. (26). The index comprises seven components, such as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication,

Table 1. Demographic and occupational characteristics of newspaper couriers and healthy individuals

	Newspaper couriers (n=35)		Healthy individuals (n=35)		t	p
	n	%	n	%		
Age (X±SS)	36.4±3.7		34.3±6.6		1.629	0.108
Marital status						0.259 ^a
Single	2	5.7	6	17.1		
Married	33	94.3	29	82.9		
Work duration (years) (X±SS)	6.5±5.4		7.5±6.5		-0.654	0.515
Daily working hours (X±SD)	9.6±3.6		9.8± 1.1		-0.177	0.860

X±SD: mean±standard deviation; t: Student's t-test; a: Fisher's exact chi-square test

and daytime dysfunction. Each component is evaluated as a score from 0 to 4, and the total score of the seven components gives the total PSQI score. The total score can range from 0 to 21; total PSQI scores ≤5 indicate good sleep quality, while scores higher than 5 indicate bad sleep quality (26).

Statistical Analyses

All statistical analyses were performed using the Statistical Package for Social Sciences 21.0 (SPSS IBM Corp., Armonk, NY, USA). Continuous numerical variables were denoted as mean±standard deviation, intermittent numerical variables as median (minimum–maximum), and categorical variables as the number of observations and percent. The significance level of the differences among groups was evaluated using Student's t-test. Categorical variables were evaluated using Fisher's exact chi-square test. The correlations between continuous numerical variables were investigated using Pearson's correlation test. If the p value was <0.05, the results were accepted as significant.

RESULTS

The demographic and occupational characteristics of newspaper couriers and healthy individuals are shown in Table 1. The mean ages of newspaper couriers and healthy individuals were 36.4±3.7 and 34.3±6.6 years, respectively. Among all newspaper couriers, 33 (94.3%) individuals were married and two (5.7%) were single; among healthy individuals, 29 (82.9%) were married and six (17.1%) were single. There was no statistically significant difference regarding age and marital status between the two groups (p>0.05). The mean occupational durations at their present jobs were 6.5±5.4 years for newspaper couriers and 7.5±6.5 years for healthy individuals. The daily total working hours for newspaper couriers and healthy individuals were 9.6±3.6 and 9.8±1.1 h, respectively. There was no statistically significant difference with respect to occupational duration in the present job and daily total working hours between the two groups (p>0.05).

In Table 2, the comparisons of daily sleeping hours for newspaper couriers and healthy individuals are shown. The median time to go to sleep was 10:00 pm (08:00 pm–00:00 am) for newspaper couriers and 11:00 pm (10:00 pm–01:00 am) for healthy individuals; the wake-up time was 03:00 am (02:00 am–04:00 am) for newspaper couriers and 07:00 am (03:30 am–09:00 am) for healthy individuals. Fifteen newspaper couriers stated that they slept during the daytime, and their mean daytime sleep duration was 2.93±1.15 h. The mean nighttime sleep duration of newspaper couriers (4.76±0.88 h) was significantly lower than that of healthy individuals

Table 2. Comparison of daily sleeping hours of newspaper couriers and healthy individuals

	Newspaper couriers (n=35)	Healthy individuals n=35	t	p
Time to go to sleep [median (min–max)]	22:00 (20:00–00:00)	23:00 (22:00–01:00)		
Time to wake up [median (min–max)]	03:00 (02:00–04:00)	07:00 (03:30–09:00)		
Night sleep duration (hours) (X±SD)	4.76±0.88	6.31±1.04	-6.755	0.001*
Daytime sleep duration (hours) (X±SD) (n=15)	2.93±1.15	-		
Daily total sleep duration (hours) (X±SD)	6.01±1.71	6.31±1.04	-0.885	0.380

*p<0.05. Median (min–max): median (minimum–maximum); X±SD: mean±standard deviation; t: Student's t-test

Table 3. Comparisons of the SCL-90-R, PSQI, and SF-36 scores of newspaper couriers and healthy individuals

	Newspaper couriers (n=35)	Healthy individuals (n=35)	t	p
SCL-90-R				
Somatization	0.88±0.53	0.59±0.50	2.355	0.021*
Obsessive-compulsive	0.97±0.66	0.82±0.62	0.972	0.335
Interpersonal sensitivity	0.81±0.68	0.78±0.64	0.231	0.818
Depression	0.75±0.68	0.67±0.60	0.515	0.608
Anxiety	0.62±0.51	0.47±0.46	1.259	0.212
Hostility	0.65±0.62	0.67±0.71	-0.119	0.906
Phobic anxiety	0.36±0.47	0.23±0.31	1.377	0.173
Paranoid ideation	0.83±0.66	0.74±0.70	0.558	0.579
Psychoticism	0.54±0.52	0.37±0.44	1.475	0.145
Additional items	0.81±0.69	0.64±0.61	1.059	0.293
Global symptom index	0.72±0.50	0.61±0.47	0.945	0.348
PSQI				
Subjective sleep quality	1.23±0.94	0.94±0.64	1.485	0.143
Sleep latency	0.60±0.84	0.81±0.76	-1.122	0.266
Sleep duration	2.11±0.93	0.87±0.80	5.991	0.001*
Habitual sleep efficiency	0.17±0.45	0.40±0.74	-1.565	0.123
Sleep disturbance	0.73±0.64	0.73±0.44	0.013	0.990
Use of sleeping medication	0.00±0.00	0.86±0.37	-1.358	0.179
Daytime dysfunction	0.74±0.78	0.57±0.69	0.975	0.333
Total PSQI score	5.56±3.07	4.41±2.41	1.735	0.087
SF-36				
Physical functioning	89.33±13.95	90.76±12.21	-0.456	0.650
Physical role limitations	81.43±23.36	91.07±15.92	-2.018	0.048*
Pain	84.50±15.02	83.52±18.39	0.243	0.809
General health	75.02±15.11	79.31±12.59	-1.293	0.201
Vitality	69.64±14.84	71.07±16.04	-0.387	0.700
Social functioning	76.57±19.84	80.57±20.28	-0.834	0.407
Emotional role limitations	80.00±23.50	89.05±17.12	-1.841	0.070
Mental health	76.76±13.47	79.42±13.02	-0.842	0.403

*p<0.05. SCL-90-R: Symptom Checklist-90-R; PSQI: Pittsburg Sleep Quality Index; SF-36: short form-36; t: Student's t-test

als (6.31±1.04 h, p=0.001); however, there was no statistically significant difference between the two groups regarding total daily sleep duration (p>0.05).

In Table 3, comparisons of SCL-90-R, PSQI, and SF-36 scores of newspaper couriers and healthy individuals are shown. The mean score of the somatization subscale of SCL-90-R of newspaper couriers was significantly higher than that of healthy individuals (t=2.355, p=0.021). There were no significant differences in the scores of the other subscales or the global symptom index between the two groups (p>0.05). With regard to the sleep duration score of PSQI, newspaper couriers were significantly different from healthy individuals (t=5.991; p=0.001). We did not find any significant difference for the scores of other components and total PSQI (p>0.05). The mean score of the physical role limitations subscale of SF-36 was significantly lower in newspaper couriers than that of healthy individuals (t=-2.018; p=0.048). The scores of the other domains of SF-36 were not significantly different between the two groups (p>0.05).

In Table 4, correlation coefficients and significant levels for PSQI and SCL-90-R are observed. We found significant positive correlations between subjective sleep quality and global symptom index, somatization, and additional items; sleep duration and somatization and additional items; sleep disturbance and global symptom index, somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and additional items; daytime dysfunction and global symptom index, somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, paranoid ideation, psychoticism, and additional items; and total PSQI score and somatization and additional items.

In Table 5, correlation coefficients and significant levels for PSQI total and subscale scores are shown. We found significant negative correlations between subjective sleep quality and physical functionality; physical role limitations, pain, vitality, and social functionality; sleep duration and physical role limitations; social functionality and emotional role limitations; sleep disturbance and physical functionality, physical role limitations, pain, general health, vitality, social functionality, and emotional role limitations; use of sleeping medication and physical functionality and pain; daytime dysfunction and physical functionality, physical role limitations, pain, general health, vitality, social functionality, and emotional role limitations; total PSQI score and physical functionality, physical role limitations, pain, vitality, social functionality, and emotional role limitations.

DISCUSSION

We investigated psychiatric symptoms and sleep and life qualities in newspaper couriers who work permanently at early hours and in healthy individuals who work during the daytime. The results indicate that working at early hours might affect psychiatric health and sleep and life qualities.

In other studies, total sleep duration was found to be shorter in night workers than in day workers. Drake et al. (15) found that the duration of night sleep was 6.1 h in night workers and 6.8 h in day workers. In a me-

Table 4. Correlation coefficients and significant levels of PSQI and SCL-90-R scores

	GSI	SOM	OC	INT	DEP	ANX	HOST	FANX	PAR	PSY	AD
SSQ	0.253*	0.292*	0.155	0.214	0.189	0.218	0.172	0.072	0.166	0.220	0.250*
SL	0.156	0.112	0.015	0.133	0.057	0.166	0.147	0.024	0.070	0.099	0.356**
SDUR	0.179	0.320**	0.079	0.131	0.129	0.141	0.063	0.149	0.074	0.143	0.257*
HSE	0.042	-0.027	0.001	0.111	0.029	0.015	-0.019	0.100	-0.017	-0.033	0.150
SDIS	0.472**	0.382**	0.296*	0.459**	0.382**	0.433**	0.371**	0.259*	0.411**	0.381**	0.454**
USM	0.096	0.139	0.104	0.157	0.008	0.052	-0.053	0.112	-0.001	0.116	0.129
DD	0.431**	0.334**	0.36**	0.431**	0.310**	0.353**	0.295*	0.191	0.446**	0.413**	0.329**
PSQI	0.198	0.301*	0.058	0.147	0.149	0.142	0.087	0.053	0.073	0.108	0.336**

*p<0.05, **p<0.01. GSI: global symptom index; SOM: somatization; OC: obsessive-compulsive; INT: interpersonal sensitivity; DEP: depression; ANX: anxiety; HOST: hostility; FANX: phobic anxiety; PAR: paranoid ideation; PSY: psychoticism; AD: additional items; SSQ: subjective sleep quality; SL: sleep latency; SDUR: sleep duration; HSE: habitual sleep efficiency; SDIS: sleep disturbance; USM: use of sleeping medication; DD: daytime dysfunction; PSQI: Pittsburg Sleep Quality Index

Table 5. Correlation coefficients and significant levels of PSQI and SF-36 scores

	PF	PRS	P	GH	V	SF	ERS	MH
SSQ	-0.311**	-0.299*	-0.254*	-0.135	-0.253*	-0.340**	-0.205	-0.111
SL	-0.191	-0.111	-0.134	-0.001	-0.120	-0.176	-0.123	-0.033
SDUR	-0.101	-0.317**	-0.142	-0.211	-0.225	-0.340**	-0.249*	-0.058
HSE	0.052	0.086	0.003	0.067	0.155	-0.243	0.048	0.186
SDIS	-0.462**	-0.286*	-0.347**	-0.426**	-0.324**	-0.496**	-0.285*	-0.187
USM	-0.266*	-0.090	-0.268*	-0.164	-0.187	-0.097	-0.034	-0.024
DD	-0.316**	-0.373**	-0.266*	-0.324**	-0.312**	-0.408**	-0.429**	-0.217
PSQI	-0.305*	-0.292*	-0.294*	-0.209	-0.313**	-0.419**	-0.239*	-0.091

*p<0.05, **p<0.01. PF: physical functionality; PRS: physical role limitations; P: pain; GH: general health; V: vitality; SF: social functionality; ERS: emotional role limitations; MH: mental health; SSQ: subjective sleep quality; SL: sleep latency; SDUR: sleep duration; HSE: habitual sleep efficiency; SDIS: sleep disturbance; USM: use of sleeping medication; DD: daytime dysfunction; PSQI: Pittsburg Sleep Quality Index

ta-analysis in which 36 studies were evaluated, Pilcher et al. (27) reported that the mean sleep durations of permanent day workers, permanent night workers, and rotating shift workers were 7 h, 6.6 h, and 5.85 h, respectively. In our study, we found that in newspaper couriers who are permanently awake at early hours, the mean sleep duration at night was 4.76 h, whereas in healthy individuals, it was 6.31 h. This result indicates that as in night workers, sleep duration at night may be shorter in individuals who work permanently at early hours.

In other studies, the rate of sleep disturbance has been found to be high in night and shift workers (15,28). In a systematic review in which 29 studies were evaluated, Fossum et al. (29) reported that day workers had better sleep quality, longer sleep duration, and less difficulty in falling asleep and maintaining sleep. In our study, in the evaluations that were performed using PSQI, although the rate of sleep disturbance in the study group (54.3%) was higher than that in the control group (42.9%), the difference was not found to be significant. Interestingly, the rate of sleep disturbance was also high in the control group. This may be due to self-reported measurements, small sample size, or bias in the selection of the subjects. In the PSQI subscales, only the score of the sleep duration subscale was significantly higher in the study group. This result shows that sleep disturbance in night workers may mainly be related to the shortness of their night sleep. The reason that the other subscales and total PSQI scores were not significantly different may be the high rate of sleep disturbance in healthy individuals.

In the literature, it was reported that psychiatric symptoms were more prevalent in shift workers than in day workers. Ardekani et al. (30) found that health workers working night shifts had higher rates of anxiety, somatization, and depression. Paki et al. (31) reported that nurses working shifts in intensive care units had higher rates of fatigue, sleepiness, anxiety, and depression. Selvi et al. (32) found significantly higher somatization, obsessive compulsive, interpersonal sensitivity, anxiety, paranoid ideation, and global symptom levels in nurses who perform shift work than their colleagues who work during the daytime. Drake et al. (15) reported that insomnia and daytime sleepiness were related with depression in night and shift workers. Vallieres et al. (28) showed that in shift workers, insomnia was related with anxiety, depression, chronic pain, and fatigue. Asaoka et al. (33) found that insomnia and daytime sleepiness were associated with depressive symptoms in nurses who performed shift work. These results indicate that sleep disturbance is related with physical and psychiatric symptoms in shift workers. In our study, measurements made with SCL-90-R produced significantly higher levels of somatization in the study group than in healthy individuals; however, other subscales were not significantly different in the two groups. This result may be due to the fact that there was no significant difference between the two groups regarding sleep disturbance as measured by the PSQI. In correlation analyses, the results that PSQI total and subscale scores positively correlated with psychiatric symptoms supported the finding that night work might increase psychiatric symptoms due to the presence of sleep disturbance.

In other studies, shift work was considered to be partial sleep deprivation, and this was thought to lead to psychopathology (34). The most frequently seen symptoms due to night sleep deprivation are sleepiness and fatigue (35). Kahn-Greene et al. (36) reported that sleep deprivation led to a decrease in blood stream in the prefrontal cortex in healthy individuals; this may be responsible for symptoms such as somatization, depression, and anxiety. Sleep disturbance and excessive sleepiness were reported to be due to the fact that the sleep–wake cycle was irregular and frequently opposite to the endogenous circadian rhythm. The circadian system is synchronized with exposure to environmental light. However, in shift workers, as exposure to environmental light cannot be controlled, the circadian rhythm does not adapt to the sleep–wake cycle (15).

Sleep disturbance was shown to affect life quality in several studies. Valieres et al. (28) reported that pain and social functionality domains of life quality were lower in shift and night workers, and they were related with insomnia. Waage et al. (37) found that musculoskeletal system pains were more prevalent in shift workers who had sleep disturbance than those who did not. In our study, the physical role limitations domain of SF-36 was found to be lower in newspaper couriers than in healthy individuals; however, there were no significant differences in the other domains. The negative correlations between PSQI scores, especially for sleep disturbance and daytime function components, and SF-36 scores support the finding that low sleep quality negatively affects life quality.

A noteworthy finding of our study is that the total daily sleep durations in both groups were not significantly different. Although night sleep duration was found to be significantly lower in newspaper couriers, when daytime sleep was considered, the total daily sleep duration were equivalent in the two groups. This may mean that newspaper couriers compensate for their shortness of night sleep by sleeping during the daytime. This finding might explain why there was no prominent difference for psychiatric symptoms and life quality between the two groups.

Although our study indicates that newspaper couriers who permanently wake up early may have sleep problems and consequent psychiatric symptoms and low life quality, our findings seem to be less severe than findings reported in the literature regarding shift or night workers. This may be due to the closeness of the sleep schedules of newspaper couriers to normal sleep times. Furthermore, as newspaper couriers' working hours are stable, their circadian rhythms may adapt to this schedule, resulting in better sleep quality. Actually, it was reported that circadian rhythms adapt to work at night within 1–3 weeks (38,39,40).

Our study has some limitations. Firstly, it has a cross-sectional design, which prevents the determination of the exact relationship between sleep disturbance and psychiatric symptoms and life quality. Secondly, as the subjects were evaluated by self-administered scales, the results may be biased. Furthermore, small sample size, conducting the study in only one media company, and evaluation of only the male gender prevent generalization of the results.

In conclusion, when our study is evaluated with other study results, awakening permanently at early hours outside normal schedules seems to be associated with sleep disturbance and consequent psychiatric symptoms and low life quality. For this reason, measures to increase sleep quality in individuals who work at unusual hours may be a solution for the conservation of psychiatric health and the improvement of life quality. Studies with wider sample sizes including different occupational groups with unusual working hours may provide the ability to acquire more general results. Future studies on these individuals should investigate the effects of interventions to improve sleep quality on psychiatric health and life quality.

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