Original Research

Evaluating the Relationship between Sleep Quality and Temperament in Older Adults: Data from Tabriz Older People Survey (TOPS)

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Abstract

The quality of sleep changes with age and a reduction in sleep duration is observed in the elderly. Mizaj (temperament) is a fundamental theory in traditional Persian medicine. It is defined as all sides of personality describing a person's morphological, psychological, and physiological situations. Although the evidence showed that temperament and sleep quality are related, no research has evaluated this issue statistically so far. Hence, this study aimed to evaluate the correlation between sleep quality and temperament. This cross-sectional study included 1,359 elderly people (aged 60) in Tabriz, Iran in 2019. An interviewer accomplished the Tabriz Older People Survey (TOPS), Temperament and Sleep Quality Test, and Pittsburgh Sleep Quality Index (PSQI). Our findings indicated that there was a significant relationship between global PSQI and wet temperament (p value = 0.036). In addition, hot-cold temperament was statistically related to demographical items like gender, marital status, and occupational status (p value ≤ 0.05). A similar statistically significant relationship was also seen for wet-dry temperament (p value ≤ 0.05). Moreover, the global PSQI score in female and illiterates subjects and those who lived in detached houses was high, meaning that the sleep quality was poor in these groups. According to our findings, Mizaj affects the quality of sleep in older adults. Also, living conditions of the elderly, such as gender, type of residence, level of education, and job, affect the Mizaj of the elderly people.

Keywords: Sleep quality; Older adults; Temperament; Traditional medicine; Persian medicine

Introduction

Sleep plays an important role in the achievement of body strength and takes part in changing different physiological and psychological aspects of body [1].

Sleep disorders in older adults can cause a significant public health problem. The quality of sleep changes with age and reduction in sleep duration and sleeping power is observed in the elderly [2]. Also, sleeping

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complaints are prevalent among more than half of the elderly people over 65 years old; their most common complaint is about failure to stay asleep during the night [3].

Insomnia is the most prevalent sleep problem among the elderly. It is revealed that the prevalence of insomnia symptoms in the elderly is 20-40% [4]. Some previous studies reported that the incidence of insomnia (as a chronic sleep disorder) was 50–70% in people aged over 65 years [5].

It is not still clear whether older people need more sleep or not. However, studies showed a decreased ability to take sufficient sleep at this age category [6]. This might be due to several reasons, including medication intake, changes in the endogenous circadian clock, medical and psychiatric illness, and specific sleep disorders, such as sleep-related breathing disorder, periodic limb movements in sleep, etc. [7].

The Pittsburgh Sleep Quality Index (PSQI) [8] has 19 questions to measure sleep quality in seven subjective issues. In this way, the responders are grouped to "good" or "poor" sleepers. The PSQI is a fast and easy way to score the quality of sleep.

Persian medicine is one of the medical doctrines, with an estimated 10,000-year-old origin (29). Mizaj (temperament) is a fundamental theory in traditional Persian medicine. It is defined as all sides of personality describing a person's morphological, psychological, and physiological situations. Mizaj is categorized into four basic kinds, including hot, cold, wet, and dry. It is demonstrated that individuals with a dominance of hot-dry Mizaj might experience insomnia and light sleep [9]. However, the exact relationship between Mizaj and sleep quality has not been evaluated yet. Thus, this study aimed to evaluate the relationship between sleep quality and Mizaj in the elderly population in Tabriz, Iran.

Material and Methods

Tabriz Older People Health Survey is a cross-sectional study carried out by the Aging Research Institute (ARI) of Tabriz University of Medical Sciences (TUOMS) to assess older adults. A total of 1,362 individuals aged over 60 years were included in the study. The inclusion criteria were being in the desired age range and non-institutionalized people living in Tabriz. Probability proportional to size (PPS) sampling method was used to select statistical blocks from each region of Tabriz city. Finally, ten people from each selected block were randomly selected. Sampling method was described in detail elsewhere [10]. All stages of the research were done by informing the participants and obtaining an informed consent from them. We collected data on demographic information, Mizaj, and sleep quality in the elderly.

Mizaj type was determined using a 10-item Mizaj

assessment questionnaire (eight items to determine hot or cold Mizaj and two items to determine dry or wet Mizaj). Each item is scored from 1 to 3. The total score of the first eight questions indicate the state of warm or cold Mizaj (a score ≥ 18 indicates a warm Mizaj, scores 15-18 indicate a moderate or hot-cold Mizaj, and a score ≤ 15 indicates a cold Mizaj). The total score of the last two questions indicate the state of dry or wet Mizaj (a score ≥ 4 indicates a dry Mizaj, score 4 indicates a moderate or dry-wet Mizaj, and a score ≤ 4 indicates a wet Mizaj). Mojahedi et al. confirmed the validity and reliability of this method [11]. Sleep quality was assessed by PSQI, which included the following seven domains: subjective sleep quality, sleep duration, sleep latency, sleep disturbances, habitual sleep efficiency, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score. The PSQI comprises 19 self-rated questions which measure an extensive diversity of elements related to sleep quality, comprising estimates of sleep latency and duration, sleep frequency, and severity of specific sleep-related problems. These 19 items are grouped into seven component scores, each weighted on a 0-3 scale. The seven component scores are then summed to yield a global PSQI score, which has a range of 0-21; higher scores show weaker sleep quality [12]. The reliability of PSQI was evaluated by Ağargün et.al. [13]. P value less than 0.05 was considered as significant. Also, if the analysis of variance (ANOVA) test was significant, Tukey's post-hoc test was used for binary comparison.

Statistical Analysis

In this study, data were analyzed using the SPSS software, V24. To describe continuous variables that were normally distributed, mean and standard deviation and for categorical variables, frequency and percent were used. The normality of the variables was examined by Kolmogorov-Smirnov test. Chi-square test was used to compare the relative frequencies between the study groups. To identify between group differences in terms of normally distributed continuous variables, independent ANOVA test was used. In the case of ANOVA test, Tukey correction procedure was used to adjust p values for pairwise comparisons. The significance level is defined as p values less than 0.05.

Results

Out of 1,362 participants, 43.6% were males. The mean age of participants was 70.1 ± 7.88 years (males: 70.7 ± 7.99 vs. female: 69.7 ± 6.77).

Based on table 1 analysis, except for subjunctive sleep quality and daytime dysfunction, there was a significant relationship between Cold-Hot Mizaj and other components of sleep quality. People with Hot Mizaj

were less likely to suffer from sleep latency of more than one hour and sleep efficacy of less than 65%. In addition, we saw that individuals with moderate Mizaj were more prone to sleep less than 5 hours during the day. The data indicated that sleep efficacy is in link with Cold-Hot Mizaj (p = 0.015). There was also a significant relationship between sleep disturbances and Cold-Hot Mizaj (p = 0.001).

Furthermore, using sleep medication three or more times a week in cold Mizaj elderly was higher than estimated. Based on the Global PSQI score, Cold-Hot Mizaj and sleep quality are not statistically related (p value = 0.285) (Table 1). Regarding Table 2 results,

Self-declaration in fairy bad Subjective sleep quality is lower than expected. The other factor related to Wet-Dry Mizaj was sleep efficiency. Wet-tempered participants had 75-84% sleep efficiency. Likewise, results proved that medication use was less than once a week in the wet-tempered elderly. The ANOVA results shows that the total sleep quality score in people with moderate Mizaj was higher than in people with wet Mizaj (p = 0.027). Additionally, there is a significant relationship between the Global PSQI Score and Wet-Dry Mizaj variables (p value= 0.036). Also, the Global PSQI in people with moderate temperament is higher than in Wet or Cold Mizaj (Table 2).

Table 1. Sleep quality components by cold – hot Mizaj

Variable		Cold	Temperate	Hot	p-Value
Subjective sleep quality	Very good	11.4%	21.3%	20.5%	0.165
	Fairly good	67.9%	58.4%	61.4%	
	Fairly bad	14.3%	15.4%	13.4%	
	Very bad	6.4%	4.8%	4.7%	
Sleep latency	< 15 minutes	25.9%	21.4%	17.8%	0.018
	16-30 minutes	34.8%	38.3%	44.7%	
	31-60 minutes	28.9%	26.0%	28.2%	
	> 60 minutes	10.4%	14.2%	9.3%	
Sleep duration	> 7 hours	63.5%	57.8%	65.1%	0.029
	6-7 hours	21.2%	21.4%	18.2%	
	5-6 hours	8.0%	10.9%	11.5%	
	< 5 hours	7.3%	9.9%	5.2%	
Sleep efficiency	> 85%	74.1%	73.0%	81.6%	0.015
	75-84%	15.6%	15.9%	11.7%	
	65-74%	4.4%	5.2%	4.2%	
	< 65%	5.9%	5.9%	2.5%	
Sleep disturbance	Not during past month	0.0%	1.6%	0.4%	< 0.001
	Less than once a week	58.5%	66.9%	70.0%	
	Once or twice a week	37.7%	30.2%	29.6%	
	Three or more times a week	3.8%	1.3%	0.0%	
Use of sleep medication	Not during past month	60.9%	71.5%	64.0%	0.032
	Less than once a week	15.9%	10.8%	15.6%	
	Once or twice a week	9.4%	7.7%	10.4%	
	Three or more times a week	13.8%	10.0%	10.0%	
Daytime dysfunction	Not during past month	78.1%	74.6%	75.4%	0.572
	Less than once a week	10.2%	16.3%	14.2%	
	Once or twice a week	8.0%	6.1%	7.6%	
	Three or more times a week	3.6%	3.1%	2.8%	
Global PSQI* Score	Mean ± SD*	5.72± 3.363	5.43±2.954	5.27± 2.731	0.285

Notes: SD (Standard Deviation); PSQI (The Pittsburgh Sleep Quality Index)

Table 2. Sleep quality components by dry – wet Mizaj

Variable		Dry	Temperate	Wet	p-Value
Subjective sleep quality	Very good	23.2%	21.7%	17.5%	0.006
	Fairly good	54.2%	56.3%	65.8%	
	Fairly bad	16.6%	17.5%	11.7%	
	Very bad	5.9%	4.4%	5.1%	
Sleep latency	< 15 minutes	22.5%	20.1%	19.9%	0.106
	16-30 minutes	40.8%	36.9%	42.9%	
	31-60 minutes	25.8%	27.4%	27.3%	
	> 60 minutes	10.9%	15.6%	9.9%	
Sleep Duration	> 7 hours	60.5%	57.1%	64.3%	0.248
	6-7 hours	21.1%	20.5%	19.6%	
	5-6 hours	10.9%	13.0%	9.3%	
	< 5 hours	7.5%	9.4%	6.8%	
Sleep efficiency	> 85%	77.4%	70.1%	80.3%	0.003
	75-84%	14.0%	18.0%	12.0%	
	65-74%	5.7%	4.7%	4.2%	
	< 65%	3.0%	7.1%	3.4%	
Sleep disturbance	Not during past month	2.3%	0.8%	0.5%	0.067
	Less than once a week	64.1%	65.7%	69.8%	
	Once or twice a week	32.0%	32.0%	29.2%	
	Three or more times a week	1.5%	1.5%	0.5%	
Use of sleep medication	Not during past month	70.0%	69.6%	65.0%	0.010
	Less than once a week	10.0%	10.4%	16.4%	
	Once or twice a week	8.5%	7.5%	10.0%	
	Three or more times a week	11.5%	12.5%	8.6%	
Daytime dysfunction	Not during past month	75.7%	76.9%	74.3%	0.902
	Less than once a week	15.7%	13.2%	15.2%	
	Once or twice a week	6.3%	6.6%	7.2%	
	Three or more times a week	2.2%	3.3%	3.2%	
Global PSQI Score	Mean ± SD	5.38 ± 3.038	5.70 ± 3.177	5.21± 2.659	0.036

Notes: SD (Standard Deviation); PSQI (The Pittsburgh Sleep Quality Index)

Almost half of the studied population were completely illiterate, with the illiteracy rate being significantly higher among females than males (73.5% vs. 26.5%; P < 0.001).

The results of Chi-square test showed that the distribution of hot and cold temperament based on the variables of gender, marital status, and educational status was not homogeneous. While 30.8% of participants with cold Mizaj were males, 69.2% were females. Based on the results, 77.6% of participants with hot Mizaj were married and 22.4% were single. Moreover, the tendency of participants with lower levels of education was towards cold Mizaj. We witnessed that 65.8% of participants with a dry Mizaj and 75.8% with a wet Mizaj were married. Most of the married elderly people were wet-tempered. The prevalence of dry Mizaj in illiterate people was higher than well-educated participants.

Self-expression about the quality of mental sleep in males was very good. Likewise, 76.7% of females and 23.3% of males fell asleep within more than 60 minutes. Also, 81% of married and 19% of single participants fell asleep within less than 15 minutes. The educational level was linked to the time to fall asleep.

Based on the results, 91.7% of male participants did not report any disturbance in the past one month. Meanwhile, female participants were more prone to sleep disturbances. It was also revealed that 37% of single participants had complaints of sleep disturbances once or twice a week. In addition, illiterate people suffered from sleep disturbance more than educated participants.

Discussion

Sleep construction alters as getting older, so that the elderly individuals go to sleep later and their sleep is fragmented and lighter [14-16]. Based on epidemiological indications, sleep complaints (i.e., disturbance in falling asleep, waking up very soon, need to take a nap, feeling of no rest) is stated once in half of older people [17]. Statistical results in our study showed that subjective sleep quality in female and single housewives was lower than other groups. Li et al. established that marital status could affect sleep quality. Becoming widowed, divorce, and being single had direct associations with insomnia and sleep disturbances [18-20]. In contrary to our study, Cartwright et al. found that divorce and widowhood had no relevance to sleep architecture [21,22]. Also, our results showed that sleep disturbances appeared in female and illiterate elderly and those living in detached houses. Furthermore, females, married elderly, households, and illiterate participants had problems with falling asleep early. Also, based on the study by Azfar et al., sleep patterns showed a little discrepancy in males and females, so that sleep latency in males is shorter than females. Also, it has been reported that sleep duration in males is 20 minutes more than females on average; these results are in line with our findings [1].

According to the results of global PSQI, illiterate elderly women and people living in detached houses had high scores, indicating the lowest sleep quality. Babacan et al. reported no significant relationship between sleep quality and marital status, income, education, and gender in the elderly [23]. Yao et al. indicated that sleep quality is in association with gender, education level, and family relationships. This study revealed that the higher the level of education, the less the duration of sleep [24]. This might be related to the job pressure because some educated elderly work after retirement. In contrary, Luo et al. stated that more sleep disorders occurred in the Chinese elderly with low education levels [25]. This difference might be due to differences between the studies regarding the mean years of education and study location. In Persian manuscripts, insomnia, defined as perception of insufficient sleep in amount or quality, is called "Sahar". According to humoral medicine considered by early Persian practitioners, imbalanced humors or natures may result in disorders, such as insomnia. In this regard, 'hot' or 'dry' nature, as well as excess of bile or black bile can affect sleep and cause insomnia. In this regard, Persian scholars have mentioned that management of these conditions would considerably correct or alleviate sleep disorder. Generally, treatment approaches which were employed by Persian scholars included the administration of natural medicines, especially herbs, focusing on dietary measures and body purgation. Based on humoral medicine strategies, Persian practitioners considered herbs having balancing properties to correct the imbalance [26]. Petramfar and Nimrouzi et al. prepared a summary of medicinal plants that are effective in regulating Mizaj and sleep quality [27].

Our study revealed that the relative frequency of sleep disturbances (three or more times a week) was higher in cold-tempered people, but there was no correlation between sleep disturbance and wet-dry Mizaj. Also, another study showed that participants with Saudavi) cold and dry) temperament had the most disturbed and lightest sleep, but participants with Safravi Mizaj (hot and dry) and Damvi Mizaj (hot and wet) showed comfortable sleep, whereas those with Balghami Mizaj (cold and wet) had sound sleep [28].

It is believed that wetness and coldness in the brain might cause normal sleep, and the dominance of hotness and dryness in the brain can cause insomnia [29]. The Persian medicine states that hot-tempered people are more active and sleep less than cold-tempered individuals. Melatonin is known as the sleep hormone; it has been established that those with fewer quantities of melatonin are more prone to insomnia, and it is a hypothesis that individuals with more levels of melatonin have cold Mizaj. Thus, high levels of melatonin in people with a cold Mizaj can be one of the reasons for improving sleep quality, but this hypothesis needs more accurate studies to prove [30]. Excess sleep has a lot of negative consequences like increase of cold Mizaj and weakness in the body. Our results were in line with the studies reporting that women in each group of Mizaj revealed disturbed sleep. Healthy activity of the body, thinking power, and improvement in mood are the advantages of enough sleep [1]. Based on our findings, daytime dysfunction in male participants was higher than females, which might be due to greater prevalence of hot Mizaj in them.

Conclusion

According to our results, Mizaj affected the quality of sleep in old people. Also, gender, type of residence, level of education, and job status could affect Mizaj in the elderly people.

Statement of Ethics

The study protocol was reviewed and approved by the ethics committee of Tabriz University of Medical

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