An Overlooked Detail: Sleep and Quality of Life in Patients with Atrial Fibrillation

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Objective: The aim of this study was to investigate sleep quality and quality of life, sociodemographic variables that may affect sleep quality, and the relationship between sleep and quality of life in patients with atrial fibrillation (AF).

Materials and Methods: This descriptive cross-sectional study had a sample of 84 individuals (AF patients from April 2019–January 2020). The Patient Description Form, the Pittsburgh Sleep Quality Index (PSQI), and the EQ-5D health-related quality of life instrument were used to collect data.

Results: The mean total PSQI score was 10.72 (±2.73), we found that most of the participants (90.5%) had poor sleep quality. While there was a significant difference between the sleep quality and employment status of the patients, there was no significant difference between age, gender, marital status, education level and income status, comorbidity, family history of AF, continuously used medication, non-drug AF treatment, and AF duration (*P* > .05). The sleep quality of those working in any job was better than of their non-working counterparts. Regarding the correlation between sleep quality and quality of life, a medium-level negative correlation was found between the patients' total mean PSQI and EQ-5D visual analogue scale scores. However, no significant correlation was found between the total mean PSQI and EQ-5D scores.

Conclusion: We found that sleep quality in patients with AF was poor. In these patients, sleep quality should be evaluated and taken into consideration as a factor that affects quality of life. [*P R Health Sci J 2023;42(1):16-22*]

Key words: Atrial fibrillation, Sleep quality, Quality of life, Nursing

Atrial fibrillation (AF) is a chronic, persistent, and common cardiac arrhythmia that affects some adults; it is a progressive disease (1). The prevalence of AF has been reported to be 2 to 4% in the general population (2). It is more commonly seen in geriatric populations, and its prevalence in those over the age of 80 years increases sharply; it affects approximately 10% of persons in that age group (3). Increasing age is a prominent AF risk factor, but the increasing burden of other comorbidities, including hypertension, diabetes mellitus, heart failure (HF), coronary artery disease, chronic kidney disease, obesity, and obstructive sleep apnea (OSA), is also important; modifiable risk factors are potent contributors to AF development and progression (2). The prevalence and incidence are higher in males than in females (2,4). Also, AF is associated with increased mortality and morbidity from hemodynamic and thromboembolic complications (5). However, with the increase in the proportion of the elderly all over the world, more individuals are expected to be affected by AF-related strokes, while the rates of hospitalization and doctor visits will also increase, and, consequently, health system costs will increase (6).

Atrial fibrillation shows a wide range of symptoms: palpitations, dyspnea, fatigue, chest tightness/pain, poor exercise tolerance, dizziness, and syncope (2). Also, AF has a negative effect on sleep quality (2,7,8). Patients with AF, HF, and/or hypertension tend to have high prevalences of OSA, which not only is the most common form of sleep-disordered breathing but also is associated with increased risks of both mortality and significant cardiovascular events (9). In a study by Szymanski et al. (7), it was shown that low sleep quality was common in patients with AF, affecting approximately 50% of them; these individuals had shorter sleep periods than did patients with sinus rhythm (7). With all the above-named conditions, AF creates health problems in the patient who suffers from it and has a negative effect on his or her quality of life (7,10).

The basic aims in the management of AF are to decrease the patient's symptom load, to prevent thromboembolic events,

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and to improve the patient's quality of life (2,11). Health-related quality of life is an important element in the evaluation of health, from a holistic standpoint (2,12). Perceived health includes reported physical, mental, and social functioning (13,14). It is stated in the literature that there is a strong correlation between an individual's quality of life and that person's general state of health. An assessment of quality of life is of great importance, especially in patients with chronic conditions such as AF, who can be affected both by the disease and by its treatment (12). It is known that the quality of life in patients with AF is significantly disrupted in comparison with that of the general population, but the effects of sleep and quality of life on each other in this group of patients have not been sufficiently investigated. We were unable to find any studies in the literature that dealt with this subject. The aim of this study was to investigate sleep quality and quality of life, sociodemographic variables that may affect sleep quality, and the relationship between sleep and quality of life in patients with atrial fibrillation (AF).

Materials and Methods

Study design and sampling

This research was planned and conducted as a descriptive cross-sectional study. The research sample consisted of 84 patients being monitored and treated either as in-patients or out-patients at a teaching and research hospital in the Central Anatolia region of Turkey from April 2019 through January 2020, who were over the age of 18 years, who had had a diagnosis of AF for at least 6 months, whose ejection fraction value was over 30%, and whose physical and cognitive health were sufficient for them to complete the forms. The exclusion criteria were as follows: suffering from valvular heart disease, having undergone any kind of operation in the previous 6 months, being obese (BMI≥30) and/or having undergone a previous ablation procedure, suffering from respiratory failure, having an acute and/or chronic kidney injury, and having a pre-existing diagnosis of anxiety or depression (or both). The study used random, nonprobability sampling, individuals who met the inclusion criteria were able to participate in the study. The research data was collected by the researchers through face-to-face interviews between 8:00 AM and 4:00 PM. The interviews required 10 to 15 minutes.

Data collection

The patient description form

This form was created by the researchers and was based on information from the relevant literature (2,6,7,15). It contained questions on sociodemographic characteristics, such as the patient's age, gender, marital status, education level, profession, and income level, and questions about his or her illness (e.g., its duration) and its treatment, tobacco and/or alcohol use, previous operations, and whether the patient continuously used any kind of medication.

The Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) was developed by Buysse, Reynolds, Monk, Berman, and Kupfer (16). It is a self-report scale that analyzes sleep quality and sleep disturbances in the time interval of 1 month (16). The reliability and validity of the scale were tested in Turkey by Ağargün, Kara, and Anlar (17). Its Cronbach's alpha internal consistency coefficient was found to be .804. This self-reported questionnaire assesses sleep quality and contains 19 self-rating questions spread across 7 components: subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medications, and daytime dysfunction. The total score of the PSQI can range from 0 to 21, with a total score of up to 5 equating to good sleep quality and anything over 5 equating to bad sleep quality (17).

The EQ-5D Health-related Quality of Life Instrument

The EQ-5D is a generic questionnaire that consists of 2 parts: the EQ-5D index and the EQ-5D visual analogue scale (VAS). The EQ-5D index assesses quality of life in 5 dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) (18). Each dimension has 3 levels of severity: no problems, some/moderate problems, or extreme problems (19). The validity and reliability of the Turkish version were tested in 2011 by Süt and Ünsar, and a Cronbach's alpha value of .86 was attained. The second part of the instrument, the EQ-5D VAS, assesses an individual's current state of health by indicating a number from 0 to 100 on a scale similar to that of a thermometer. The scale gives a quality-of-life score of between 0 and 100, inclusive (20). For this part of the instrument, patients answer questions covering the 5 dimensions named above, the answers being on a 5-point Likert scale; on the VAS scale, they score that day's health level, from 0, the worst imaginable level of health, to 100, the best imaginable level of health.

Data analysis

Data were analyzed with the Statistical Package for Social Sciences 22.0 (SPSS, IBM Corp., Armonk, NY, USA). The ordinal data obtained from the data collection forms were used to calculate arithmetic means, standard deviations, and minimum and maximum values; frequencies and percentages were calculated using nominal data. Spearman's correlation analysis was used to evaluate the correlation between sleep quality and quality of life. Results that yielded a P value of less than .05 (95% CI) were considered statistically significant.

Ethical considerations

This study was conducted according to the principles of the Declaration of Helsinki. Permission to conduct the research was obtained from the Human Research Ethics Committee (No. 2019/33, dated 22 February 2019), institution permission was obtained, and permission to use the scale was obtained from its owners. The patients taking part in the research were informed about the study, and their verbal and written consent to participate was obtained.

Results

The mean age of the patients taking part in the study was 64.60 (±10.56) years; 57.1% were male, and 58.3% were educated through the primary level. Also, 88.1% were married, and more than half (82.1%) lived with their immediate family. The patients had had a diagnosis of AF for an average of 6.98 (±4.23) years, and 83.3% of them had a comorbidity. Most of the participants (95.2%) continuously used some kind of medication, and more than half (55%) used an anticoagulant drug.

Table 1 shows the means and standard deviations of the total PSQI scores and the PSQI sub-dimension scores of the participants in the study. According to the findings obtained, the total mean PSQI score was 10.72 (±2.73). In this study, 90.5% of the participants had poor sleep quality and 9.5%, good sleep quality. Of the participants' PSQI sub-dimension scores, the highest mean score was from the sub-dimension of habitual sleep efficiency (2.59 ± 0.87), followed by sleep duration (2.51 ± 0.78) (Table 1).

Upon examining the answers given by the participants to each of the items on the EQ-5D index, we saw that 59.5% of the participants answered "some problems" for *mobility*, 61.9% answered "some problems" for *self-care*, 53.6% answered "no problems" for *usual activities*, 47.6% answered "no problems" for *pain/discomfort*, and 65.5% answered "some problems" for *anxiety/depression*. The mean VAS score was 61.78 (SD: 15.3; min: 30; max: 90) (Table 2).

Table 1. Distribution of participants' mean scores on the total sleep quality index and its sub-dimensions (n = 84)

PSQI sub-dimension	Total n = 84	Good sleep quality (≤5 points) n = 8	Poor sleep quality (>5 points) n = 76
	M ± SD	M ± SD	M ± SD
Subjective sleep quality	0.38 ± 0.57	0.00 ± 0.00	0.42 ± 0.59
Sleep latency	1.60 ± 0.53	1.25 ± 0.46	1.64 ± 0.53
Sleep duration	2.51 ± 0.78	0.87 ± 0.35	2.68 ± 0.59
Habitual sleep efficiency	2.59 ± 0.87	0.37 ± 0.51	2.82 ± 0.50
Sleep disturbances	1.46 ± 0.56	1.12 ± 0.35	1.50 ± 0.57
Use of sleep medications	0.77 ± 0.58	0.12 ± 0.35	0.84 ± 0.56
Daytime dysfunction	1.39 ± 0.62	0.87 ± 0.35	1.44 ± 0.61
Global PSQI score	10.72 ± 2.73	4.62 ± 0.51	11.36 ± 1.96

M ± SD: mean ± standard deviation; PSQI: Pittsburgh Sleep Quality Index

When the sociodemographic characteristics of the participants and some variables were compared with the PSQI, it was found that the patients who did not work at any job (70.3%) had significantly worse sleep quality compared to those who were employed ($P > .05$) (Table 3). The sleep quality of those who worked at any job was better than that of the participants who did not. No significant difference was found between the sleep quality of the patients and age, gender, marital status, education level and income status, comorbidity, family history of AF, continuously using medication, non-pharmaceutical AF treatment, and the duration of AF ($P > .05$) (Table 3).

Table 2. Distribution of frequency of answers given for each item on the EQ-5D

5Q-5D Dimension	No problems n (%)	Some problems n (%)	Extreme problems n (%)
Mobility	31 (36.9%)	50 (59.5%)	3 (3.6%)
Self-care	30 (35.7%)	52 (61.9%)	3 (2.4%)
Usual activities	45 (53.6%)	37 (44.0%)	2 (2.4%)
Pain/discomfort	40 (47.6%)	37 (44.0%)	7 (8.3%)
Anxiety/depression	15 (17.9%)	55 (65.5%)	14 (16.7%)
	M ± SD		Min-Max
EQ-5D VAS score	61.78 ± 15.3		30–90
EQ-5D index score	0.31 ± 0.21		0–0.94

M ± SD: mean ± standard deviation; Min-Max: minimum to maximum; VAS: visual analogue scale

The mean total score on the PSQI of the patients taking part in the study was 10.72 (±2.73), and their mean score on the EQ-5D was 0.31 (±0.21). Table 4 shows a medium-level negative correlation between total PSQI and EQ-5D VAS mean scores ($r = -.427$; $P < .001$). At the same time, weak negative correlations were found between the mean EQ-5D VAS score and subjective sleep quality ($r = -.316$; $P = .003$), sleep disturbances ($r = -.373$; $P < .001$), and the use of sleep medications ($r = -.250$; $P = .022$); this score also had a medium-level negative correlation with daytime dysfunction ($r = -.460$; $P < .001$). Weak positive correlations were found between the mean EQ-5D score and subjective sleep quality ($r = .229$; $P = .036$), sleep disturbances ($r = .225$; $P = .019$), the use of sleep medications ($r = .227$; $P = .037$), and daytime dysfunction ($r = .323$; $P = .003$). However, no significant correlation was found between total PSQI and EQ-5D mean scores ($r = .167$; $P = .129$) (Table 4).

Discussion

The integrated holistic management of patients with AF is essential to improving their outcomes (2). Low sleep quality is common in patients with AF (21). In fact, 50% to 85% of patients with AF have poor sleep quality (7,21,22). Also, it was found in the study described herein that the mean PSQI score of patients with AF was 10.72 (±2.73), and that the sleep quality of most of the patients (90.5%) was poor. In the study by Şengül and Uysal (2019), the mean PSQI score was 11.31 (±3.37), while in the study by Kayrak et al., it was found to be 9.4 (±4.6), with the sleep quality of the patients diagnosed with AF being poor (15,23). However, unlike the prior findings, in a large cross-sectional study conducted in 2016, the prevalence of poor sleep quality in the general population was found to be 38% (22). In addition, participants in the 2016 study who worked had poorer sleep quality than did those who did not work. However, age, gender, marital status, education level and income status, comorbidity, family history of AF, the continuous use of

Table 3. Comparison of the sociodemographic variables with sleep quality

Variable	Total n (%)	Good sleep quality (≤5 points) n (%)	Poor sleep quality (>5 points) n (%)	Test values
Age (years)				
60≤	29 (34.5)	4 (4.8)	25 (29.8)	X^2 = 2.120
61–69	28 (33.3)	1 (1.2)	27 (32.1)	*P* = .548
70–79	21 (25.0)	2 (2.4)	19 (22.6)	
80≥	6 (7.1)	1 (1.2)	5 (6.0)	
Gender				
Female	36 (42.9)	2 (2.4)	34 (40.5)	X^2 = 1.151
Male	48 (57.1)	6 (7.1)	42 (50.0)	*P* = .283
Marital status				
Married	74 (88.1)	7 (8.3)	67 (79.8)	X^2 = -.054
Single	10 (11.9)	1 (1.2)	9 (10.7)	*P* = .956
Educational status				
Literate but did not finish school	12 (14.3)	1 (1.2)	11 (13.1)	X^2 = 7.520
Primary school	49 (58.3)	3 (3.6)	46 (54.8)	*P* = .111
Secondary school	6 (7.1)	0 (0.0)	6 (7.1)	
High school/university	17 (20.3)	4 (4.8)	13 (15.5)	
Income status				
Expenditures > income	9 (10.7)	1 (1.2)	8 (9.5)	X^2 = 0.422
Expenditures = income	57 (67.9)	6 (7.1)	51 (60.7)	*P* = .810
Expenditures < income	18 (21.4)	1 (1.2)	17 (20.2)	
Employment status				
Working	8 (9.5)	3 (3.6)	5 (6.0)	X^2 = 8.031
Not working	76 (90.5)	5 (6.0)	71 (84.5)	*P* = .005
Comorbidities				
Yes	70 (83.3)	6 (7.1)	64 (76.2)	X^2 = 0.442
No	14 (16.7)	2 (2.4)	12 (14.3)	*P* = .506
Family history of AF				
Yes	32 (38.1)	3 (3.6)	29 (34.6)	X^2 = 0.001
No	52 (61.9)	5 (6.0)	47 (56.0)	*P* = .971
Continuously used medication				
Yes	80 (95.2)	8 (9.5)	72 (85.7)	X^2 = 0.442
No	4 (4.8)	0 (0.0)	4 (4.8)	*P* = .506
Medication continuously used				
Antilipidemics	4 (5.0)	0 (0.0)	4 (5.0)	X^2 = 6.010
Diuretics	10 (12.5)	0 (0.0)	10 (12.5)	*P* = .111
Anticoagulants	44 (55.0)	3 (3.8)	41 (51.2)	
Antihypertensives	22 (27.5)	5 (6.5)	17 (21.3)	
Non-pharmaceutical AF treatment				
Yes	24 (28.6)	2 (2.4)	22 (26.2)	X^2 = 0.055
No	60 (71.4)	6 (7.1)	54 (64.3)	*P* = .814
	M ± SD (Min-Max)	**M ± SD**	**M ± SD**	
Age (years)	64.60 ± 10.56 (23–86)	64.75 ± 12.17	64.59 ± 10.47	*Z* = 0.466 *P* = .497
Duration of AF (years)	6.98 ± 4.23 (1–20)	5.00 ± 3.66	7.19 ± 4.26	*Z* = 1.689 *P* = .197

AF: atrial fibrillation; M ± SD: mean ± standard deviation; Min-Max: minimum to maximum

medication, non-drug AF treatment, and AF duration did not affect sleep quality. Risom et al. found that the more severe AF symptoms are associated with poor sleep quality (21). Similar results have been reported in another study (7). Sleep quality and the symptoms of AF have a multifactorial relationship, with poor sleep quality often resulting from those symptoms, themselves provoked by the increased sympathetic activity associated with AF (21). Moreover, it is thought that the poor sleep quality of the participants without steady jobs might have been linked to their not having consistent sleep/wake times, occasionally causing them to be sleepy during daylight hours.

Progressive cardiac symptoms in patients, functional limitations, and prolonged stays in the hospital can cause a deterioration of sleep quality (15). In studies examining the association of insomnia and arrhythmia, it has been reported that AF can cause insomnia AF may develop in the long term in those with insomnia (24). In a systematic review looking at the correlation between sleep duration and the incidence of AF in healthy people, it was found that a sleep duration of less than 6 hours or more than 8 hours, both of which were defined as being unhealthy, could be associated with an increased risk of AF (8). Since the AF type and disease burden of the participants were not evaluated in the study, additional comments about this subject could not be provided.

In terms of quality of life and functional status, more than 60% of AF patients have significantly impaired QoL/exercise tolerance (25,26,27), but only 17% have disabling symptoms (27). Quality of life is significantly lower in women (25,28), young individuals, and AF patients with comorbidities (11). The main focus of this study was to evaluate sleep quality and quality of life in patients with AF; findings obtained from the EQ-5D showed a deterioration of quality of life in patients with AF. In the study, a mean EQ-5D VAS value of 61.78% and a mean EQ-5D index score of 0.31 (±0.21) were found. In a study by Tsounis et al. (5), in patients with AF, the mean EQ-5D VAS was found to be 59.63%, and the mean EQ-5D index score was 0.58 (±0.23) (5). What we found in our study is similar to what has been observed in others in the literature. In a study conducted with a population of individuals with cardiac disease, a significant correlation was found between changes in sleep duration and mortality and adverse cardiovascular outcomes; it was also found that a sleep duration of more than the recommended 7 to 8 hours was associated to a greater degree with moderate harm than was a sleep duration of less

Table 4. Correlation between participants' sleep quality and quality of life

Pittsburgh Sleep Quality Index	EQ-5D index score		EQ-5D VAS score	
	r*	*P*	r*	*P*
Global PSQI score	.167	.129	-.427	<.001
Subjective sleep quality	.229	.036	-.316	.003
Sleep latency	.005	.966	-.131	.236
Sleep duration	-.111	.317	-.142	.199
Habitual sleep efficiency	-.206	.060	-.014	.898
Sleep disturbances	.255	.019	-.373	<.001
Use of sleep medications	.227	.037	-.250	.022
Daytime dysfunction	.323	.003	-.460	<.001

*Spearman's correlation coefficient. PSQI: Pittsburgh Sleep Quality Index; VAS: visual analogue score

than 7 hours (29). In addition to this, both short (<5 hours) and long (>9 hours) sleep durations affect cardiovascular disease outcomes, so that sleep duration is of great importance (29,30). Therefore, although sleep quality is very important in patients with AF, it is notable that the rate of poor sleep quality was high in the findings of the study. The underlying causes of this condition, that is poor sleep quality, should be considered comprehensively and causally.

Consisting of several components, quality of sleep is a complex construct (31). With regard to the correlation in this study between sleep quality and quality of life, no significant correlation was found between the total PSQI score and the total sleep-quality index score. However, a weak positive correlation was found between the PSQI sub-dimensions of subjective sleep quality, sleep disturbances, use of sleep medications, and daytime dysfunction and the sleep-quality index score. As well as showing that general sleep quality did not affect the quality of life in patients with AF, our study showed that subjective sleep quality, sleep disturbances, use of sleep medications, and daytime dysfunction had positive effects on quality of life. In addition, a moderate negative correlation was seen between total PSQI and EQ-5D VAS mean scores. At the same time, a weak negative correlation was found between subjective sleep quality, sleep disturbances and the use of sleep medications and the mean EQ-5D VAS score; a moderate negative correlation was found with daytime dysfunction. Increased anxiety rate is emphasized due to the low quality of life in AF patients (32). In addition, exposure to chronic stress syndromes, such as post-traumatic stress disorder, is also associated with an increased risk of AF events (33). Although other studies have reported the negative effects of AF on sleep quality and quality of life (14,34), no studies were found which examined the relationship between sleep quality and quality of life.

Strengths and limitations

In order to correctly interpret the findings of this study, a number of strengths and limitations need to be taken into consideration. To our knowledge, studies investigating the relationship between sleep quality and quality of life in patients with AF are limited. Therefore, it is thought that this study will contribute to and innovate the literature. However, it has some limitations. First, although self-reported sleep parameters such as duration are frequently used, a lack of objective evidence supporting the correctness of the data gave a potential bias to the study. Therefore, our findings cannot be generalized to the whole country due to the small sample size and the fact that the study was conducted at a single center. Finally, another limitation of this study is that some of the variables, such as disease stage, performance status, and the AF type of the participants, were not questioned.

Conclusion

It was concluded in this study that the sleep quality of the patients with AF who made up the sample was poor. However, the general sleep quality in these patients did not affect their quality of life. Many parameters of sleep quality—subjective sleep quality, sleep dysfunction, the use of sleep medication, and daytime dysfunction—were significantly correlated with quality of life. Recently, there has been increased interest in the connection between sleep dysfunctions, which have a significant effect on AF and cardiovascular morbidity and mortality, and quality of life. The diagnosis and treatment of sleep problems and the provision of support in this area will improve the quality of life in patients with AF. It is thought that, in this regard, the authors results will be important in terms of showing the current situation.

Clinical implication

This result brings to the fore the nurses' evaluations of patients, as a whole, and the comprehensive questioning of sleep quality. However, this study also reveals that it is important for nurses to know which AF patients are at a greater risk when caring for those with low sleep quality. To improve the sleep quality of these patients, nurses need to make regular evaluations of the hospital environment (e.g., noise issues) and attempt to negate—or at least reduce—those that would be barriers to sleep. It is necessary to eliminate the negative factors that affect the quality of sleep as much as possible and to raise awareness of this issue.

Resumen

Objetivo: El objetivo de este estudio fue investigar la calidad del sueño y la calidad de vida, las variables sociodemográficas que pueden afectar la calidad del sueño y la relación entre el sueño y la calidad de vida en pacientes con fibrilación auricular (FA). Métodos: Este estudio transversal descriptivo tuvo una muestra de 84 individuos (pacientes con FA de abril de 2019 a enero de 2020). Para recopilar datos, se utilizaron el Formulario de Descripción del Paciente, el Índice de calidad del sueño de Pittsburgh (PSQI) y el Índice de Calidad de Vida EQ-5D. Resultados: La puntuación media total del PSQI fue de 10,72 (±2,73), encontramos que la mayoría de los participantes (90,5%) tenían una mala calidad del sueño. Si bien hubo una

diferencia significativa entre la calidad del sueño y el estado laboral de los pacientes, no hubo diferencia significativa entre la edad, el sexo, el estado civil, el nivel de educación y el nivel de ingresos, la comorbilidad, los antecedentes familiares de FA, consumo continuo de medicamentos, tratamiento no farmacológico de la FA y duración de la FA ($p > 0.05$). La calidad del sueño de quienes trabajaban en cualquier trabajo era mejor que la de sus contrapartes que no trabajaban. En cuanto a la correlación entre la calidad del sueño y la calidad de vida, se encontró una correlación negativa de nivel medio entre las puntuaciones medias totales de PSQI y EQ-5D escala analógica visual de los pacientes. Sin embargo, no se encontró una correlación significativa entre las puntuaciones medias totales del PSQI y el índice de calidad de vida EQ-5D. Conclusiones: En el estudio se encontró que la calidad del sueño en pacientes con FA era mala. En estos pacientes, la calidad del sueño debe ser evaluada y tomada en consideración como un factor que afecta la calidad de vida.

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