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RESEARCH

EFFECTS OF SLEEP QUALITY, INCOME LEVEL AND COMORBID CONDITIONS ON QUALITY OF LIFE IN A TURKISH ELDERLY POPULATION: A MULTICENTRE STUDY

ABSTRACT

Introduction: Our aim is to investigate the effects of sleep quality, income level and comorbid conditions on Quality of Life in a Turkish elderly population.

Materials and Method: This multicentric study was performed in seven districts. A total of 1030 patients older than 65 years of age who applied to the internal medicine and geriatrics outpatient clinics of study centres between January and December 2014 were included. All patients underwent the Pittsburgh Sleep Quality Index and Quality of Life Assessment (Short Form 36) tests viaface to face interview method. The demographic properties of patients were also recorded during this interview.

Results: The mean Quality of Life subscale scores, except for vitality, were significantly lower (p<0.001) in patients with poor sleep quality. When analysing the relationship between Quality of Life and multiple chronic diseases, it was observed that patients having multiple chronic diseases had significantly lowered scores in three subscales (physical functioning, mental health and bodily pain; p=0.04, p=0.04, p=0.01, respectively). There were significant differences between patients with high versus low income level with respect to the mean physical functioning, mental health and bodily pain subscales (p=0.01).

Conclusion: Our study demonstrated an adverse effect of low sleep quality, multiple chronic disorders and low income level on Quality of Life.

Key Words: Quality of Life; Sleep; Comorbidity; Aged.

ARAŞTIRMA

TÜRK GERİATRİK POPÜLASYONDA UYKU KALİTESİ, GELİR DURUMU VE KOMORBİDİTENİN YAŞAM KALİTESİNE ETKİSİ: ÇOK MERKEZLİ ÇALIŞMA

ÖZ

Giriş: Bu çalışmanın amacı Türk geriatrik popülasyonda uyku kalitesi, gelir durumu ve komorbiditeleri yaşam kalitesine etkisini araştırmaktır.

Gereç ve Yöntem: Çalışma İç Hastalıkları ve Geriatri polikliniklerine ayaktan başvuran, 65 yaş üstü 1030 hastayı içeren çok merkezli bir çalışmadır. Hastalarla yapılan yüzyüze görüşme yoluyla Pittsburgh Uyku Kalitesi ve Yaşam Kalitesi Kısa Form (Short Form–36) testleri yapıldı. Görüşmede ayrıca hastaların demografik özellikleri kaydedildi.

Bulgular: Uyku kalitesi düşük olan hastaların ortalama yaşam kalitesi subskala skorları (Zindelik skoru hariç) anlamlı olarak daha düşüktü (p<0,001). Çoklu kronik hastalığı olanların yaşam kalitesi 3 parametrede (Fiziksel fonksiyon, Mental sağlık, Ağrı) anlamlı olarak daha düşüktü (sırasıyla p=0,04; p=0,04; p=0,01). İlave olarak gelir durumu iyi olanlarda Fiziksel fonksiyon, Mental sağlık, Ağrı subskala skor ortalamaları anlamlı olarak daha yüksekti (p=0,01).

Sonuç: Çalışma düşük uyku kalitesi, çoklu kronik hastalık varlığı ve düşük gelir durumunun yaşam kalitesine olumsuz etkisini ortaya koymuştur.

Anahtar Sözcükler: Yaşam Kalitesi; Uyku; Komorbidite; Yaşlılık.

INTRODUCTION

Ageing is an inevitable process associated with a reduction in stress response, adaptation to environmental factors, reserve capacity of organs and homeostatic control. Due to the rapid progress made in the treatment of fatal complications associated with infectious diseases and atherosclerosis in the last few decades, life expectancy has greatly improved, which in turn has increased the proportion of the elderly population among the total population. The worldwide growth of the elderly population is also observed in the Turkish society. In 2013, the proportion of the elderly population to total Turkish population was 8% (1). It has been predicted that this figure will increase by 2- to 3-fold by next 30 years, in parallel with a drop in fertility rates coupled with increased life expectancy as a result of early and effective diagnosis and treatment of chronic disorders (2).

Quality of life (QOL) broadly refers to feelings of happiness and satisfaction with one's life and requires harmony of individuals' expectations, values and concerns with those of the society in which one lives, including a good physical and mental health. Studies have shown a strong correlation between sleep quality and QOL, which suggests that sleep quality may be an important marker for QOL. In addition to being an inevitable process, ageing is a major cause of reduced QOL as a result of chronological, biological, social and psychological decline. Compared with other age groups, aged population has a greater prevalence of chronic disorders, which in turn leads to limitation of one's social activities with reduced QOL (3).

In this multicentre study, we aimed to investigate the effects of sleep quality, income level and chronic disorders on QOL in a Turkish elderly population who applied to the internal medicine and geriatrics outpatient clinics.

MATERIALS AND METHOD

Subjects

This study included 1030 patients older than 65 years of age who applied to the of the study centres in Istanbul, Ankara, Duzce, Corum, Mardin, Malatya and Diyarbakir provinces between January and December 2014. Patients were selected from a total of seven hospitals that were included study's cities. All patients underwent the Pittsburgh Sleep Quality Index (PSQI) ve Quality of life Assessment (Short Form 36) tests via a one-on-one interview method.

The demographic characteristics of the patients were also recorded during this interview, including age, sex, marital status persons with whom the patient lives income, educational status, number of co-morbidities (0–3 vs ≥4), and polypharmacy (currently using ≥5 drugs). In addition, the patients were also questioned about alcohol consumption and smoking habits. Patients living in nursing homes and with a Mini Mental State Examination (MMSE) score less than 17 were excluded. Informed consent was obtained from each patient. The local ethics committee of Dicle University approved the study.

Scales Used in the Study

The Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI), which can assess the patient's status for most of the days and nights in previous months, was used to measure sleep quality. There are seven component scores in this questionnaire consisting of 19 items, including subjective sleep quality, sleep onset latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medications and daytime functioning, which altogether give a global score of 0 to 21. Higher global scores are indicative of worse sleep quality; as such a PSQI global score of ≥5 is suggestive of poor sleep quality. Its validity and reliability in the Turkish population were studied by Agargün et al. (Cronbach's alpha=0.80) (4).

Short Form 36 (SF-36)

This scale has been shown to be suitable for many societies and cultures in assessing the QOL. Kocyigit et al (5) conducted a study of validity and reliability of SF-36 in the Turkish version. It has eight subscales containing simple questions that assess physical functioning, social functioning, physical role limitation, emotional role limitation, bodily pain, mental health, vitality and general health.

Statistical Analysis

Statistical analyses were performed using SPSS for Windows 18.0 (SPSS Inc., Chicago, IL, USA). Data were tested for normal distribution using Kolmogorov–Smirnov test. Continuous variables were shown as mean ± standard deviation or median interquartile ranges as applicable. Continuous variables were compared using the Student's t-test and nominal variables using Chi-square test. Correlation analysis was performed by Pearson or Spearman test as applicable. A p value below 0.05 was considered as statistically significant.

RESULTS

The mean age of the whole study population was 71.7 ± 7.1 years and the women percent was greater than men

(54.9%). Among all the age groups in the whole study population, the early elderly age group was 67.3%.. The mean PSQI score of the whole study population was 3.6±2.2. A total of 604 (58.6%) patients had low income and 182 (17.6%) had chronic disorders. The overall characteristics of the whole study population are shown in Table 1.

Table 1— Clinical and Demographic Characteristics of the Patients.

Variables	N=1030
Sex, Female (n, %)	566(54.9%)
Age (years, mean±sd)	71.7±7.1
Age group (n, %)	
65-74	694(67.3%)
75-84	282(27.3%)
>84	54(5.4%)
Quality of life scores (Mean±SD)	
Physical functioning	66.3±14.7
Social functioning	67.1±14.2
Physical role	72.3±56.3
Emotional role	64.6±15.8
Mental health	64.1±16.2
Vitality	65.0±24.2
Bodily pain	65.3±15.1
General health	68.8±32.9
PSQI score (Mean±SD)	3.6±2.2
Number of medications (Mean±SD)	4.3±1.2
Education, low, (n, %)	887(%86.1)
Income status, low, (n, %)	604(%58.6)
Number of children (<4), low, (n, %)	798(%77.4)
Smoking, current, (n, %)	206(20%)
Alcohol use, current, (n, %)	63(6.1%)
Multiple chronic diseases (? 4),(n,%)	182(17.6%)
Polypharmacy present (n, %)	734(%71.2)
Marital status, (n, %)	
Married	724(70.2%)
Single	16(1.6%)
Widow	290(%28.1)
The person with whom the patient lives, (n, %)	
Spouse	726(%70.4)
Alone	82(%7.9)
Children	197(%19.1)
Relatives	25(%2.4)

SD: Standard Deviation, PSQI: Pittsburgh Sleep Quality Index.

Evaluation of the patients for sleep quality showed that the mean QOL subscales except for Vitality were significantly lower in the patients with poor sleep quality (p < 0.001). Analysis of the relationship between QOL and the presence of multiple chronic disorders showed that those having multiple chronic disorders had significantly lower scores in three subscales (physical functioning, mental health and bodily pain) (p=0.04, p=0.04 and p=0.01, respectively). Finally, analysis of income level in terms of QOL showed significant differences between patients with high vs low income with respect to mean physical functioning, mental health and bodily pain subscale scores (p=0.01 for all). The mean QOL scores and their statistical comparisons are shown in Table 2.

Pearson correlation test was performed between the QOL score and continuous variables such as age, sleep score, number of children, number of chronic disorders, and number of medications used. Besides the number of children, other continuous variables showed a significant correlation to QOL subscale scores. The results of the Pearson correlation analysis are shown in Table 3.

Discussion

This multicentre study demonstrated the unfavourable effects of low sleep quality, multiple chronic disorders and low income level on QOL. In addition, our study showed a low health-related QOL (HRQOL) in the elderly subjects with such socio-demographic characteristics as being female, being in the middle or old elderly period, smoking, being single or divorced, living alone, having less number of children, and absence of polypharmacy.

Research efforts towards the effects of health conditions on QOL have recently been hastened. Health and QOL are closely inter-related. This close association can be evaluated using HRQOL measures, which assess the individuals' physical, biological, psychological and social status (6,7).

Sleep disorders are reportedly present in more than 50% of the general population aged greater than 65 years. Ageing is associated with a reduction in the duration, quality and efficiency of sleep. A poor sleep quality causes excessive daytime sleepiness, health problems, depression and reduced QOL (8). Many previous studies have investigated the relationship between sleep disorders and HRQOL, although their results have been considerably inconsistent. The discrepancy between the results of the different studies was represented by two studies from Spain (8,9), one of which suggested that short sleep duration and reduced HRQOL were related to each ot-

Table 2— Quality of Life Subscale Scores According to Clinical and Demographic Characteristics of the Study Population.

	PF	SF	PR	ER	MH	Vit	BP	GH
Sex								
Male	64.1±15.5	**68.5±25.9c**	**77.5±28.4b**	64.7±10.6	74.5±26.4	**63.8±10.2b**	55.9±35.2	**68.2±14.3b**
Female	63.2±18.5	**64.2±35.5**	**68.0±15.8**	62.6±18.2	72.4±16.1	**66.3±14.0**	58.8±21.4	**63.2±42.3**
Age group								
65-74	**63.6±15.9c**	67.5±14.0	73.1±56.4	65.4±34.4	**74.5±33.1c**	**66.7±14.2c**	56.0±24.8	**65.5±21.1a**
75-84	**61.8±25.8**	66.8±35.5	71.7±41.8	53.0±25.6	**63.1±22.8**	**63.7±16.5**	54.1±15.5	**52.7±32.1**
>85	**58.0±20.5**	63.8±22.6	64.8±16.3	62.8±29.9	**60.1±15.5**	**60.8±26.2**	52.8±20.1	**41.5±20.1**
Income								
Good	**64.0±16.2c**	67.3±14.5	73.6±59.8	66.4±14.1	**64.2±17.5c**	54.8±24.7	44.9±25.6	**70.1±41.1c**
Poor	**60.1±14.9**	66.9±13.8	70.5±50.9	63.5±12.6	**60.1±15.8**	56.2±25.5	42.4±23.1	**63.9±14.7**
Education								
Low	54.1±13.2	58.5±24.3	75.5±19.7	54.6±15.5	64.6±26.4	73.4±12.8	50.5±25.5	58.8±20.1
High	52.5±28.1	60.1±34.6	78.0±12.5	62.6±10.4	62.3±20.2	76.6±10.8	52.0±30.6	56.5±40.3
Alcohol								
Yes	56.4±20.5	52.7±20.4	68.4±50.1	60.7±10.8	68.8±33.4	75.5±35.7	51.2±25.5	58.8±12.2
No	52.6±14.4	58.6±33.8	64.7±42.6	54.1±23.5	64.4±14.5	69.1±22.6	46.7±26.4	55.4±20.5
Smoking								
Yes	64.0±15.9	64.3±16.2	73.5±42.4	**59.1±23.1c**	65.4±18.5	56.5±35.4	**62.6±30.1c**	48.7±33.5
No	62,5±15.1	62.8±15.5	72.0±30.5	**55.6±35.5**	61.6±21.1	54.5±20.7	**56.8±28.4**	46.5±20.2
Marital Status								
Married	63.9±15.4	**68.0±14.2c**	**71.2±40.1a**	65.2±15.1	64.4±19.5	65.4±14.0	**69.0±32.5c**	68.1±14.4
Single	61.6±20.7	**64.1±16.2**	**58.7±25.5**	67.6±25.7	68.8±22.0	63.6±10.9	**66.3±14.5**	69.2±24.5
Widow	63.2±16.1	**60.8±14.3**	**65.6±40.1**	63.0±14.4	63.1±14.4	63.9±10.1	**65.4±18.5**	70.5±35.4
Whom lived								
Spouse	**64.0±15.5c**	**68.1±14.1c**	**70.3±40.0b**	**65.3±17.2c**	60.4±12.4	65.4±14.1	**66.2±24.9c**	**68.2±19.3b**
Alone	**60.3±16.1**	**62.8±12.7**	**61.5±19.4**	**57.1±16.9**	58.1±12.6	63.3±13.6	**60.1±15.2**	**54.1±22.2**
Children	**64.3±16.0**	**65.4±14.6**	**81.5±12.5**	**61.3±25.5**	61.8±14.2	63.9±15.7	**64.5±26.5**	**80.7±40.4**
Relative	**57.5±16.2**	**63.0±13.5**	**73.3±33.6**	**64.6±22.1**	58.1±22.5	64.7±15.8	**61.6±15.8**	**66.6±28.4**
Number of children								
0-3	**60.2±17.1b**	66.6±15.6	73.4±38.2	**61.6±27.5b**	**60.5±18.8a**	**63.2±16.3c**	**52.5±17.4b**	68.0±14.5
>3	**64.5±15.1**	67.3±13.8	72.0±52.4	**65.5±11.5**	**65.2±18.5**	**65.5±13.8**	**56.1±14.3**	69.0±36.6
PSQI								
Good	**68.6±12.4a**	**72.5±10.6a**	**73.9±11.1a**	**73.1±10.6a**	**70.0±12.5a**	74.7±37.6	**70.9±10.1a**	**70.4±11.2a**
Poor	**53.5±16.3**	**56.3±14.1**	**64.9±16.6**	**54.7±14.8**	**52.1±16.5**	66.7±24.5	**53.6±16.3**	**54.0±14.0**
Chronic Disease								
0-3	**66.2±14.6c**	67.2±14.1*	71.8±51.0*	67.0±15.0*	**66.9±15.3c**	66.1±24.5*	60.1±11.7*	**59.0±25.7b**
≥4	**51.8±15.1**	66.9±14.4	74.6±32.4	65.1±11.3	**51.4±11.4***	57.8±10.2	45.9±10.6	**57.7±24.6**
Polifarmasi								
Yes	53.6±11.5	66.9±24.1	72.3±54.5	64.4±32.3	**72.8±41.5b**	**55.5±12.7b**	62.4±25.4	**68.7±33.1b**
No	50.8±16.0	67.7±15.5	71.5±14.9	63.2±22.0	**61.5±15.8**	**43.2±11.4**	59.8±21.1	**55.4±25.8**

a; p<0.001, b; p<0.01, c; p<0.05, PF: Physical functioning, SF: Social functioning, PR: Physical role, ER: Emotional role, MH: Mental health, Vit: Vitality, BF: Bodily pain, GH: General health, PSQI: Pittsburgh Sleep Quality In.

Table 3— Pearson Analysis of the Continuous Variables in the Study Population.

	PF	SF	PR	ER	MH	Vit	BP	GH
Age	r= - 0.039	r= - 0.059	* r= - 0.078	** r= - 0.086	r= - 0.044	** r= - 0.084	r= - 0.050	** r= - 0.098
PSQI scala score	*** r= - 0.0395	*** r= - 0.045	*** r= - 0.0453	*** r= - 0.0423	*** r= - 0.0431	*** r= - 0.0466	*** r= - 0.0419	*** r= - 0.0496
Number of children	r= 0.049	r= 0.003	r= 0.015	r= 0.052	* r= 0.065	r= 0.031	r= 0.043	r= 0.019
Number of chronic disease	r= - 0.177	r= 0.057	* r= 0.062	*** r= - 0.222	*** r= - 0.232	*** r= - 0.0126	*** r= - 0.195	r= 0.026
Number of drugs used	*** r= 0.103	** r= 0.084	*** r= 0.125	*** r= 0.124	* r= 0.079	r= 0.033	** r= 0.089	** r= 0.095

PF:Physical functioning, SF: Social functioning, PR: Physical role, ER: Emotional role, MH: Mental health, Vit: Vitality, BF: Bodily pain, GH: General health, PSQI: Pittsburgh Sleep Quality Index, *;p<0.05, **;p<0.01, ***;p<0.001

her while the other rejected such an association. Furthermore, Duran et al (10) and Lo and Lee (11) found a strong correlation between sleep quality and QOL in studies with 975 and 301 subjects, respectively. Such conflicting results also suggest that further research is necessary to clarify the relationship between sleep duration and QOL. In our study, the QOL scores except for the Vitality subscale were significantly lower in the patients with low sleep quality. Furthermore, there was a significant correlation between PSQI score and all subscale scores of the QOL score.

Patients with low HRQOL also suffer from chronic disorders. Kriesgman et al (12) reported that the number of disorders an individual suffers was closely related to physical functional decline. On the other hand, a multinational study conducted in eight countries found that chronic conditions affect QOL to a similar degree and in a similar pattern, despite some variations between the study countries (13). Wei et al (14) demonstrated a strong correlation between chronic disorders and QOL in a study comprising 3714 subjects. We detected a partial correlation between the presence of multiple chronic disorders and QOL, with physical functioning, mental health and general health subscale scores being significantly lower in patients with multiple chronic disorders. Similarly, there existed a significant correlation between the number of chronic disorders and certain subscales of QOL.

The impact of socio-demographic characteristics and clinical conditions on HRQOL has also been extensively investigated. HRQOL may be associated with low income and educational level as well as poor health status (15). Lubetkin et al (16) showed that a lower income predicted a low

HRQOL in more than 13,000 Americans. The English Longitudinal Study of Aging indicated that lower income and educational levels and poor health status, among others, reduce HRQOL (15). The mean scores of the physical functioning, mental health and general health parameters were significantly lower in the subjects with low income compared with the high income group.

Kempen et al (17) reported that physical and social function and mental health components of QOL were related to educational level in the elderly people. We found no significant difference with respect to educational level and QOL scores. HRQOL seems to decline more rapidly as one ages, as evidenced by some reports of significantly worse HRQOL in older than younger subjects. There are also reports of gender effect on HRQOL (18,19).

In our country a study by Turgul et al (20) using the SF-36 scale reported that in individuals >65 years of age, the mean QOL scores of males were higher than those of females. Altuğ et al (21) found no significant difference between both genders with respect to QOL scores in an elderly population. HRQOL was partly affected by gender and age in our study. This might be due to various reasons. First, women are more prone to have depression, chronic disorders and to be involved in care provision.

Quality of Life of the elderly has been documented to be altered by social–psychological factors. Marventeno et al (22) reported that the most important positive factor for QOL was living with one's family, neighbours and relatives. We also found a significant correlation between QOL and the number of the persons an old person lived together and the number of

children he/she had. QOL scores were higher in the elderly subjects living with spouse, children or relatives compared with those living alone; those with a number of children greater than three also had higher QOL scores. The above findings that are in disagreement with previous reports may have stemmed from the difference of the socio-demographic properties of the Turkish society. That is, family bonds are stronger in Turkish society. Hence, in contrast to the elderly people living in western societies, the elderly population of the Turkish society usually live together with their relatives. QOL is also affected by marital status and a subject's ethnic origin. Living with one's own spouse may lead to increased activity during daily life and a sense of well-being and confidence. Hence, as compared with ones who are divorced, widowed or never married, the elderly people who are married or live with someone else had a higher QOL (23). We also demonstrated higher QOL scores in married persons compared with those who were either single or divorced.

In conclusion, our study demonstrated the unfavourable effects of sleep quality, presence of multiple disorders and low income level on QOL. Furthermore, many socio-demographic characteristics (such as having advanced age, being female, smoking, living alone, having less number of children, and absence of polypharmacy) were correlated to a lower QOL. Social support programmes aiming at the modifiable ones of these factors can contribute to efforts to increase QOL in the elderly.

Limitations

Our study has some limitations. Firstly, the descriptive nature of the study does not allow us to determine causality. Second, our patients represented a geriatric population presenting to geriatry clinics and may not necessarily represent the whole population. Thirdly, the results of the study may have been affected by false reporting or under-reporting, as some study data were based on personal statements.

Conflict of Interest

The authors declare that they have no conflicts of interest concerning this article.

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