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# *Association of Gastritis with Sleep and Quality of Life: A Hospital-based Cross-sectional Study*

## *Gastritin Uyku ve Yaşam Kalitesi ile İlişkisi: Hastane Temelli Kesitsel Bir Çalışma*

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### Abstract

**Objective:** Gastritis is an important public health problem that negatively affects many people in the world. In studies conducted, the most frequently mentioned risk factors for gastritis in studies are *H. pylori*, spicy and smoked foods, smoking, and alcohol consumption. This study investigates the effect of life and sleep quality on gastritis, which has not been emphasized much before.

**Materials and Methods:** In this hospital-based cross-sectional study, 277 participants who underwent gastroscopy were given the Pittsburgh sleep quality scale and the quality of life index. Statistical analysis of the data was done with SPSS 22.0.

**Results:** Gastritis was detected in 66.4% of the patients who underwent gastroscopy. According to the logistic regression analysis results, gastritis is 6.935 (confidence interval: 3.023-15.908) times more common in people with poor sleep quality than in people with good sleep quality. We determined that the probability of developing gastritis was high in those with poor sleep quality and mental health.

**Conclusion:** It is important to identify risk factors for the prevention and early treatment of gastritis. According to the findings of this study, it is thought that stomach complaints should be specifically questioned in patients with sleep and mental disorders.

**Keywords:** Gastritis, mental health, quality of life, sleep disorders, stress

### Öz

**Amaç:** Gastrit, dünyada birçok insanı olumsuz etkileyen önemli bir halk sağlığı sorunudur. Yapılan çalışmalarda gastrit için en sık belirtilen risk faktörlerinin *H. pylori*, baharatlı ve tütsülenmiş yiyecekler, sigara ve alkol tüketimi olduğu gösterilmiştir. Bu çalışma, yaşam ve uyku kalitesinin gastrit üzerine daha önce üzerinde fazla durulmayan etkisini araştırmayı amaçlamaktadır.

**Gereç ve Yöntem:** Hastane temelli bu kesitsel çalışmada gastroskopi yapılan 277 katılımcıya Pittsburgh uyku kalitesi ölçeği ve yaşam kalitesi indeksi verildi. Verilerin istatistiksel analizi SPSS 22.0 ile yapıldı.

**Bulgular:** Gastroskopi yapılan hastaların %66,4'ünde gastrit saptandı. Lojistik regresyon analizi sonuçlarına göre uyku kalitesi kötü olan kişilerde gastrit, uyku kalitesi iyi olan kişilere göre 6,935 (güven aralığı: 3,023-15,908) kat daha fazla görülmekte idi. Uyku kalitesi ve ruh sağlığı kötü olanlarda gastrit gelişme olasılığının yüksek olduğu belirlendi.

**Sonuç:** Gastritin önlenmesi ve erken tedavisi için risk faktörlerinin belirlenmesi önemlidir. Bu çalışmada, gastrite neden olabilecek uyku ve ruhsal bozuklukları olan hastalarda mide şikayetlerinin özel olarak sorgulanması gerektiği sonucuna varılmıştır.

**Anahtar Kelimeler:** Gastrit, ruh sağlığı, yaşam kalitesi, uyku bozuklukları, stres

## Introduction

Gastritis is a widespread disease that can last a lifetime, progresses confidentially in humans, and indicates inflammation of the gastric mucosa (1). It is the most common gastroscopy finding in patients presenting with dyspepsia, nausea, and vomiting (2). Gastritis is still a serious public health problem in both developed and developing countries. It is a disease that affects individuals' socio-economic status, lifestyles, living conditions, behaviors, and habits, in short, their living standards. 50.8% of the population in developing countries and 34.7% of the population in developed countries have health problems due to gastritis. In this context, gastritis threatens patients' physical health and impairs their quality of life (QoL) (3).

Previous studies have revealed that factors such as gender, age, socio-economic status, biological, environmental factors, and individual behaviors may contribute to gastritis. The most common cause of gastritis is *Helicobacter pylori* infection (4,5). Other causes include eating acidic, spicy, or hot meals often, drinking too much alcohol, smoking, and taking certain medications like nonsteroidal anti-inflammatory drugs (NSAIDs). Chronic stress and impairment of mental health can also induce gastritis (6-8). Although gastric acid is essential for the digestion

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of food, in cases of psychological stress, gastric acid secretion increases and prepares the ground for gastritis (7,9). Gastritis has been reported many times in the literature to impair sleep and life quality (5,10,11). However, when we look at the matter from the opposite side, a few studies have shown that poor sleep quality, causes an increase in gastrointestinal diseases. Excessive secretion of proinflammatory cytokines in sleep disorders causes gastric mucosa to be damaged more easily (12,13). Dyspepsia, which is one of the most important symptoms of gastritis, can be seen due to sleep disorders and related changes in eating habits (14).

There are few studies on psychiatric conditions that may cause gastritis such as depressive disorder and anxiety disorder (8,15,16). As far as we know, sleep disorders and poor mental health affecting the QoL that can cause gastritis have not been studied sufficiently. Aware of such gaps in the work environment and limited evidence, this study aimed to evaluate the implications of poor mental health and sleep quality on gastritis. Identifying the risk factors specifically associated with gastritis is an essential point to implement the necessary measures. It is therefore vital to distinguish the factors that may cause gastritis and, implement measures to intervene against factors that contribute to gastritis.

## Materials and Methods

**Research design:** This is a hospital-focused cross-sectional study.

**The research universe:** The number of gastroscopies performed in the general surgery endoscopy unit in 2020 as the universe in the research was formed. The number of gastroscopies performed in 2020 was 998. It is assumed that the same number of gastroscopies will be performed in 2021.

**The sample of the study:** The number of people to be sampled was calculated with the formula n=Nt2 p q/d2 (N-1) + t2 p q. N is the number of individuals in the universe; n is the number of individuals to be sampled; p is the incidence (probability) of the event under investigation; q is the frequency (probability) of the event under investigation; t is the theoretical value found in the table t at a given degree of freedom and the detected error level; d is the desired ± deviation according to the incidence of the event. Accordingly, p=0.50; q=0.50; t=1.96; when d=0.05, the sample size was determined as 277 people.

**Inclusion criteria for the study:** Patients who were diagnosed with gastritis as a result of the gastroscopy procedure and accepted to participate in the study.

**Exclusion criteria from the study:** Cases with normal gastroscopic findings or malignancy as a result of the gastroscopy procedure.

**Verbal/written consent and ethics committee approval:** After the Kafkas University Faculty of Medicine Ethics Committee approval (date: 11.03.2020 and no: 80576354-050-99/19), written and verbal consent was obtained from the patients. Afterward, the data of the study were collected.

**Structuring the data collection form:** The data collection form of the study was prepared by the researchers.

**The dependent variable of the study:** Gastritis status in people undergoing gastroscopy in the general surgery endoscopy unit. The study's independent variables are age, gender, Pittsburgh sleep quality index (PSQI), and QoL index.

**The preliminary trial of the study:** It was conducted with five patients who applied to the outpatient clinic and would not be included in the study. After the preliminary test, necessary corrections were made in the data collection form.

**Data collection:** Data was collected between April-October 2021 by the general surgeon and psychiatrist who conducted the research using the face-to-face interview technique.

### Measurements

**The PSQI:** Comprises 19 items and a widely used self-reported questionnaire. It is regarded as a general tool for measuring sleep quality. Its subcomponents are; subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, usage of sleep medication, and daytime dysfunction. A score of 5 or above indicates bad sleep quality (17). The Turkish validity and reliability study of the Pittsburg sleep quality was done by Agargun et al. (18).

**Short-form health survey (SF-36):** SF-36 was prepared by Rand Corporation in 1992 as short form-36 (SF-36). It, provides a wide-angle measurement among QoL scales. The scale includes items that include the perception of change in health in the last four weeks and the perception of change in health in the last week. SF-36 is a short, suitable for use in clinical practice and research. However, it has a strong general overview in terms of its comprehensive, psychometric properties. As the name of the scale suggests, 36 items consist of physical and mental components. It has three main topics (functional status, well-being, general understanding of health) and 8 health concepts (physical function, social function, physical role function, emotional role function, mental health, vitality, fatigue, pain, general perspective) (19). SF-36 was first adapted to Turkish society by Kocyigit (20), after validation.

### Statistical Analysis

Statistical analysis of the study was done with SPSS 22.0 computer program. Student t-test and chi-square tests were used in pairwise analyses. Statistically significant variables ($p<0.05$) were included in the logistic regression analysis.

## Results

Two hundred seventy-seven people participated in the study. One hundred thirty-nine (50.2%) of the participating individuals were under 47 years old, 138 (49.8%) were 48 years old and over. One hundred sixty (57.8%) were female and 117 (43.2%) were male. 66.4% of the people who underwent gastroscopy were diagnosed with gastritis.

When we look at the relationship between sleep quality and gastritis in Table 1, gastritis was found to be significantly more common in those with poor subjective sleep quality, sleep latency, habitual sleep efficiency, sleep disturbances, and daytime dysfunction ($p<0.05$). No significant difference was found in terms of sleep duration and usage of sleep medication in patients with gastritis ($p>0.05$).

According to the relationship between QoL and gastritis in Table 2, no significant relationship was found between physical and social function subscales and gastritis (p>0.05). A highly significant correlation was found between those with low total scores and all subscale scores except physical and social subscales, and gastritis (p<0.05).

According to the logistic regression analysis results, gastritis is 6.935 [confidence interval (CI): 3.023-15.908] times more common in people with poor sleep quality than people with good sleep quality. On the other hand, while the effect of physical health on QoL is lost in the regression analysis, gastritis is 1.163 (CI: 1.112-1.216) times more common in those with poor mental health than in those with good mental health (Table 3).

## Discussion

When we look at the studies conducted both in the world and in Turkey, although many data have been obtained about the causes and consequences of gastritis, the number of studies on the effects of poor mental health and sleep quality on gastritis, which significantly reduces the QoL, is limited. Our study aims to contribute to the gap in the literature that impaired sleep quality and mental health may cause gastritis. In this way, it is important to question the mental health and sleep quality of

**Table 1. The distribution of subcomponents of the Pittsburg sleep quality index**

| Subcomponents | Gastritis | n (%) | Mean | Standard deviation (±) | p |
|---|---|---|---|---|---|
| Subjective sleep quality | Yes | 184 (66.4) | 1.02 | 0.71 | 0.001 |
| | No | 93 (33.6) | 0.46 | 0.50 | |
| Sleep latency | Yes | 184 (66.4) | 1.08 | 0.81 | 0.001 |
| | No | 93 (33.6) | 0.26 | 0.51 | |
| Sleep duration | Yes | 184 (66.4) | 0.58 | 0.79 | 0.096 |
| | No | 93 (33.6) | 0.40 | 0.92 | |
| Habitual sleep efficiency | Yes | 184 (66.4) | 0.61 | 0.80 | 0.029 |
| | No | 93 (33.6) | 0.39 | 0.79 | |
| Sleep disturbances | Yes | 184 (66.4) | 1.35 | 0.52 | 0.001 |
| | No | 93 (33.6) | 1.02 | 0.33 | |
| Usage of sleep medication | Yes | 184 (66.4) | 0.56 | 0.74 | 0.116 |
| | No | 93 (33.6) | 0.41 | 0.77 | |
| Daytime dysfunction | Yes | 184 (66.4) | 3.01 | 10.60 | 0.044 |
| | No | 93 (33.6) | 0.75 | 0.67 | |
| Total score | Yes | 184 (66.4) | 6.91 | 2.96 | 0.001 |
| | No | 93 (33.6) | 3.69 | 1.75 | |

**Table 2. The distribution of subcomponents of the quality of life index**

| Subcomponents | Gastritis | n (%) | Mean | Standard deviation (±) | p |
|---|---|---|---|---|---|
| Physical function | Yes | 184 (66.4) | 63.70 | 22.38 | 0.118 |
| | No | 93 (33.6) | 68.01 | 19.99 | |
| Difficulty with physical role | Yes | 184 (66.4) | 41.28 | 25.64 | 0.001 |
| | No | 93 (33.6) | 76.88 | 20.93 | |
| Pain | Yes | 184 (66.4) | 46.22 | 16.69 | 0.001 |
| | No | 93 (33.6) | 67.85 | 10.62 | |
| General health | Yes | 184 (66.4) | 43.32 | 9.59 | 0.001 |
| | No | 93 (33.6) | 57.74 | 10.18 | |
| Vitality | Yes | 184 (66.4) | 46.44 | 8.87 | 0.001 |
| | No | 93 (33.6) | 62.10 | 11.40 | |
| Social function | Yes | 184 (66.4) | 61.62 | 21.03 | 0.292 |
| | No | 93 (33.6) | 64.11 | 12.26 | |
| Emotional role | Yes | 184 (66.4) | 29.89 | 25.67 | 0.001 |
| | No | 93 (33.6) | 86.74 | 17.82 | |
| Mental health | Yes | 184 (66.4) | 42.46 | 11.44 | 0.001 |
| | No | 93 (33.6) | 61.51 | 9.23 | |

| Table 3. The effect of age, gender, sleep quality, physical and mental health on gastritis and logistic regression results | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Independent variables** | | **Gastritis** | **No gastritis** | **Gastritis** | **No gastritis** | **p** | **OR** | **95% CI (EK-EB value)*** | **p** |
| | | **N (%)** | **N (%)** | **Mean (± SD)*** | **Mean (± SD)*** | | | | |
| Age | ≤47 | 85 (61.2) | 54 (38.8) | | | 0.062 | | | |
| | ≥48 | 99 (71.7) | 39 (28.3) | | | | | | |
| Gender | Woman | 111 (69.4) | 49 (30.6) | | | 0.224 | | | |
| | Man | 73 (62.4) | 44 (37.6) | | | | | | |
| Sleep quality | Good | 18 (20.7) | 69 (79.3) | | | 0.001 | 0.144 | 0.063-0.331 | 0.001 |
| | Bad | 166 (87.4) | 24 (12.6) | | | | | | |
| Physical health | | | | 48.63±14.19 | 67.62±9.11 | 0.001 | 0.971 | 0.931-1.012 | 0.166 |
| Mental health | | | | 45.10±12.24 | 68.61±8.48 | 0.001 | 0.860 | 0.822-0.899 | 0.001 |
| CI: Confidence interval, SD: Standard deviation, OR: Odds ratio | | | | | | | | | |

patients diagnosed with gastritis, and also, to emphasize the importance of questioning gastric complaints in those with sleep disorders and poor mental health.

In this study, patients with nausea, vomiting, stomach pain, and heartburn complaints underwent a gastroscopy and 66.4% of these patients were diagnosed with gastritis. Gastroscopy is the most commonly used study for the diagnosis of gastric pathologies (4). Gastritis is an important public health problem. 50.8% of the population in developing countries suffer from gastritis. 54.8% of adults who applied to health institutions in Kenya were clinically diagnosed with gastritis. In Ethiopia, reported that 53% of individuals between the ages of 54-61 had gastritis due to *H. pylori* infection. The result showed that the prevalence of gastritis was 73.5% in a study conducted in Pakistan (21,22). Since Turkey is a developing country, our results are consistent with the literature. It can be thought that our study can represent the whole country.

In this study, gastritis was found 6.935 (CI: 3.023-15.908) times more in those with low sleep quality than in those with high sleep quality. According to literatüre, sleep disorders may cause gastrointestinal system diseases such as gastroesophageal reflux, peptic ulcer, irritable bowel disease, inflammatory bowel disease, gastric and colorectal cancers. However, studies on gastritis are insufficient (23-26). Sleep quality affects the pathogenesis and emergence of digestive system diseases. The healthy circadian rhythm and sleep functions in the gastrointestinal system are intestinal stem cell proliferation, motility regulation, protein and carbohydrates digestion and absorption, electrolyte balance, intestinal microbiota protection, and intestinal barrier protection. Sleep is regulated by the light-dark cycle and, accordingly, by the circadian rhythm. Individually differential regulation or variation of the circadian rhythm is a common cause of sleep complaints, which plays an important role in the occurrence of many gastrointestinal disorders (25,26). In sleep disorders, pro-inflammatory cytokines that make the gastric mucosa unprotected and fragile increase, and lead to gastritis (12,13). The eating habits of individuals with sleep disorders also change. Therefore, the incidence of gastritis increases in these individuals (14). Although studies on this subject are few, it is reported that gastritis is associated with low sleep quality (27,28). Gastritis is more common in studies conducted with individuals who work night shifts and have disturbed sleep patterns (29,30). According to these findings and our results, it can be said that low sleep quality may cause gastritis.

In this study, gastritis was found 1.163 (CI: 1.112-1.216) times more common in those with poor mental health than in those with good mental health. The situation that can be confusing here is the question of whether gastritis may cause mental problems. In the QoL index we used in our study, the patients' mental problems for the last 1 month are questioned. In psychiatric examinations, it was observed that these patients struggled with mental problems for more than 1 month, and gastric complaints appeared later. In this context, poor mental health was thought to cause gastritis. Stress which indicates a deterioration in mental health causes excessive secretion of gastric acid, which is normally required for the digestion of food, and leads to deterioration of integrity of the stomach wall and causes gastritis (31). Also, for the gastric mucosa to be healthy, the production of hydrogen sulfide ($H_2S$) must be sufficient and the gastric flora must be intact. Vitamin B6 plays a leading role in the production of $H_2S$ in the stomach. In individuals under psychological stress, vitamin B6 level decreases, $H_2S$ production in the stomach decreases, and the gastric flora deteriorate. In this case, the integrity of the gastric mucosa is disturbed and gastritis is observed (7,32). According to studies, high-stress levels, anxiety and depression are associated with gastritis (8,27,33-35). Another study reported that the probability of gastritis is high in those with poor mental health (36). In a study conducted with young people, it was found that stress increases especially during seasonal exam periods, which increases the incidence of gastritis (37). Although these results should be supported by more studies on this subject, it can be said that the risk of gastritis increases in individuals with impaired mental health, both by the information in the literature and our findings. Since gastritis affects a significant part of the population, identifying the risk factors that cause gastritis can prevent gastritis. It is important to identify risk factors based on patients. Although studies conducted so far have found various risk factors, studies investigating the effects of mental health and sleep quality on gastritis are limited. According to our study,

gastritis is more common in people with impaired sleep quality and mental health. Therefore, it is very important to question gastric complaints in patients with these problems, both to prevent gastritis and to provide early diagnosis and treatment. Along with these results of our study, it should be kept in mind that gastritis may also affect sleep and QoL.

### Study Limitations

One of the limitations of our study can be considered that the number of cases is relatively low, therefore more multicenter case series in future studies will lead to more inclusive results. Another limitation is that the eating habits and body mass index of the patients are not taken into account. It is known that if the BMI is high, sleep quality decreases considerably, and gastritis is more common in these cases (38). Therefore, it can be done by considering BMI and eating habits in future studies. Another limitation is that the physical exercise status of the individuals was not taken into account. Regular physical exercise is protective in terms of mental health, sleep patterns, and gastrointestinal diseases. Therefore, physical exercise status should be considered in future studies.

## Conclusion

Since it is known that drugs such as NSAIDs can cause gastrointestinal diseases, medications used by the patients should also be questioned in future studies. In our study, patients were evaluated with the PSQI and SF-36 tests. The inability to evaluate patients with anxiety and depression scales is another important limitation of the study.

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### Ethics

**Ethics Committee Approval:** After the Kafkas University Faculty of Medicine Ethics Committee approval (date: 11.03.2020 and no: 80576354-050-99/19).
**Informed Consent:** Written and verbal consent was obtained from the patients.
**Peer-review:** Internally and externally peer-reviewed.

### Authorship Contributions

Concept: H.C., E.B.T., Data Collection or Processing: H.C., E.B.T., Analysis or Interpretation: H.C., Funding: H.C., Writing: H.C., E.B.T.
**Conflict of Interest:** No conflict of interest was declared by the authors.
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