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Review Article

Sleep Quality in Heart Failure Patients: A Systematic Review of Risk Factors and Assessment Tools

Akram Gazerani [1,2], *Zahra Sadat Manzari [3], Eesa Mohammadi [4], Mahnaz Amini [5], Tayebeh Sadat Manzari [6], Zahra Dalir [7]

1. *Department of Operating Room, Faculty of Nursing and Midwifery, Neyshabur University of Medical Sciences, Neyshabur, Iran*
2. *Student Research Committee, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran*
3. *Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran*
4. *Nursing Department, Faculty of Medical Sciences Tarbiat Modares University, Tehran, Iran*
5. *Division of Sleep Medicine, Psychiatry and Behavioral Sciences Research Center, Mashhad University of Medical Sciences, Mashhad, Iran*
6. *Department of Cardiovascular, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran*
7. *Department of Medical -Surgical Nursing, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran*

***Corresponding Author:** Email: ManzariZ@mums.ac.ir

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Abstract

Background: Poorly sleeping is a common problem for heart failure patients and can significantly decrease their quality of life. Among heart failure patients, the widespread issue of poor sleep quality can lead to a diminished quality of life. The present study aimed to review systematically the evidence focused on the determinants of sleep quality factors in heart failure patients.

Methods: We conducted a comprehensive search for observational studies in both English- and Persian-language databases from Feb 1991 to Jan 2023. The search strategy included keywords such as "sleep quality" and "heart failure" and risk factors. All screening and extraction steps were carried out by two researchers.

Results: The initial search yielded 10,357 articles. After screening, 37 studies (30 cross-sectional studies, 1 longitudinal study, 2 correlational studies, 1 prospective observational study, 2 case–control studies and 1 descriptive-analytical study) were included. We categorized the identified factors as demographic, habits and lifestyle, medication use, and psychological. The Pittsburgh Sleep Quality Index (PSQI) is the most commonly used sleep quality assessment tool.

Conclusion: Mental health-related and lifestyle factors such as depression, fatigue, female sex, and high BMI play important roles in disrupting sleep quality. In addition, it is necessary to develop new assessment tools for sleep quality specified for HF patients.

Keywords: Sleep quality; Risk factors; Heart failure; Systematic review

Introduction

Heart failure (HF) is a global health issue causing complications like fatigue, edema, and shortness of breath (1), leading to poor sleep quality in approximately 75% of HF patients (2). Sleep disturbances are strongly related to comorbidities like hypertension, diabetes, and dyslipidemia, risk factors for CVDs (3). Cardiovascular patients often face impaired sleep quality, especially after

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heart attacks, coronary artery bypass surgery, or heart failure (4). Factors affecting sleep quality in HF patients include pain (5), shortness of breath, and anxiety, which can cause drowsiness, a bad temper, and difficulty performing daily activities.
Factors such as age, enuresis, sex, depression, underlying diseases, education level, employment status, and hospital stay affect sleep quality in heart disease patients (6). Riege's study found that smoking, alcohol consumption, and body mass index were not associated with sleep disorders (7). However, Muthukrishnan et al. found anxiety as a significant predictor of poor sleep quality among HF patients after coronary artery bypass surgery (8).
Existing research has explored sleep disorders among cardiac patients, but the specific factors influencing sleep quality in this population remain unclear. Moreover, prior studies have predominantly focused on the effects of respiratory sleep disturbances, such as apnea and shortness of breath, in individuals with heart failure. Consequently, the current study sought to synthesize the factors that can impact the sleep of heart failure patients. The findings from this systematic review can inform the development of nursing interventions aimed at enhancing sleep quality for heart failure patients.

Methods

This study systematically reviewed observational studies on factors affecting sleep quality in HF patients. The review was designed using the PRISMA protocol for systematic review. The studies were included if they met the criteria of observational research, participants aged over 18 years, and those suffering from sleep disorders. Nonoriginal articles, interventional and animal studies were excluded. The study aimed to evaluate the factors affecting sleep quality in HF patients.

Literature search

This systematic review was conducted using a systematic search strategy across various electronic databases, including PubMed, Google Scholar, Web of Science, Scopus, and Science Direct, as well as relevant Persian language databases (SID, Iran Medex, Magiran, Medlib, and IranDoc), covering the period from 1991 to 2023. The review process was overseen by a health research librarian, who guided the researchers in screening publications and hand-searching for associated articles. The search strategy encompassed keywords related to sleep duration, sleep disorders, sleep hygiene, sleep problems, sleep disturbances, sleep quality, sleep-wake disorders, circadian rhythm, sleep initiation and maintenance disorders, poor sleep quality, and terms associated with heart failure, such as heart decompensation, cardiac failure, myocardial failure, congestive heart failure, chronic heart failure, and related risk factors (Fig. 1).

Data extraction

The study evaluated the quality of articles using JBI evaluation checklists for cross-sectional, correlational, and longitudinal studies. Articles with over 50% "yes" answers were included in the study. The study also discussed factors affecting sleep quality in heart failure patients, with a focus on articles with more than 50% "yes" answers (9).

Ethics approval and consent to participate

This study is a part of the doctoral thesis in the field of nursing, which was ethically evaluated and approved by the research ethics committee of Mashhad University of Medical Sciences (Code: IR.MUMS.REC.1401.233).

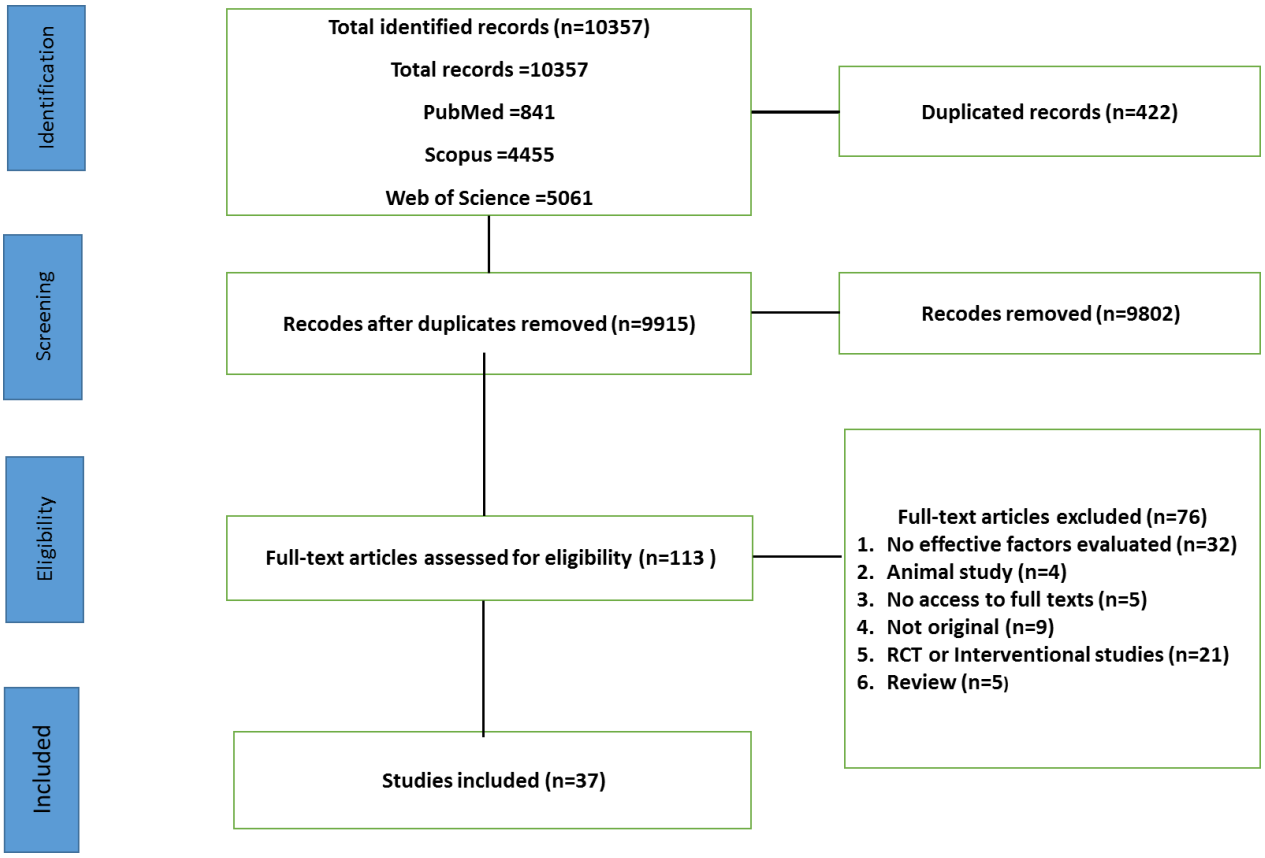

Fig. 1: Flow diagram of the database search and article selection

Results

The study analyzed 10,357 articles, excluding duplicates and initial screening. After excluding interventions, nonoriginal, or animal articles, sleep factors, and inaccessible full texts, 37 observational studies were included. These studies focused on factors influencing sleep quality in heart failure patients, providing a comprehensive basis for data extraction and analysis. The studies included 30 cross-sectional, 1 longitudinal, 2 correlational, 1 prospective observational, 2 case-control, and 1 descriptive-analytical studies (Table1).

Demographic factors

Table 2 reveals demographic determinants of sleep quality in heart failure patients. Female sex was identified as a predictor in 10 studies, while eight suggested poor sleep qualities in older participants. Financial status was emphasized as a robust predictor in one study. However, two studies contradicted these findings. Table 3 summarizes the studies, objectives, tools, and results.

Table 1: Critical appraisal of article quality

First Authors, Year, ref	Study design	sample	Mean age	Score	Decision
Redeker (2010), (10)	Cross sectional	173	60.3	7/8	Included
Jeon (2020), (11)	Cross-sectional	135	60.6	7/8	Included
Awotidebe (2017), (12)	Case control	50	60.6	8/10	Included
Chen (2013), (13)	Cross-sectional	133	62	7/8	Included
Jorge-Samitier (2020), (2)	Cross-sectional	203	81.1	7/8	Included
Lee (2016) (14)	Longitudinal,observational study	204	62	8/11	Included
Redeker (2005), (15)	Cross-sectional	61	61	6/8	Included
Riegel (2012), (7)	Cross-sectional	266	70	7/8	Included
Moradi (2014), (16)	Cross-sectional	158	73	7/8	Included
Matsuda(2015), (17)	Cross-sectional	1071	64	7/8	Included
Santos (2011), (18)	Cross-sectional	400	57	7/8	Included
Johansson (2012), (19)	Cross-sectional	613	78	7/8	Included
Nasir (2015), (20)	Cross-sectional	40	60	6/8	Included
Momayyezi (2015), (21)	Case–control	160	56	9/10	Included
Kanno (2016), (22)	Prospective observational	1083	68	7/8	Included
Janya (2017), (23)	Predictive correlational	340	60	6/8	Included
Nasiry (2018), (24)	Cross-sectional	150	52	8/8	Included
Syeda Misbah Batool (2020), (25)	Cross sectional	260	49	5/8	Included
Avcı (2021), (26)	Cross-sectional	95	65	7/8	Included
Hajj (202), (27)	Cross-sectional	113	52	8/8	Included
Goudarzian (2016), (28)	Descriptive-correlational	290	53	7/8	Included
Matsuda(2021), (29)	Cross-sectional	1294	64	8/8	Included
Lainsamputty (2018), (30)	Correlational	153	61	8/8	Included
Edmealem (2020), (31)	Cross-sectional	396	65	8/8	Included
Conley (2019), (32)	Cross-sectional	173	60	8/8	Included
Redeker (2012), (33)	Cross-sectional	109	60.3	6/8	Included
Wang (2007), (6)	Cross-sectional	101	74	8/8	Included
Erickson (2003), (34)	Cross-sectional	396	54	8/8	Included
Brostrom(2004), (35)	Cross-sectional	223	74	7/8	Included
Javadi (2014), (36)	Cross-sectional	240	60	7/8	Included
Gharaibeh(2023), (37)	Cross-sectional	200	58	7/8	Included
Esnaasharieh(2022), (38)	Cross-sectional	100	60	7/8	Included
Kania(2022), (39)	Cross-sectional	505	57.1	8/8	Included
Xiong(2023), (40)	Cross-sectional	254	64	8/8	Included
Zeighami Mohammadi 2013, (41)	Cross-sectional	100	5	7/8	Included
Aria (2017), (42)	Cross-sectional	100	69	8/8	Included
Aslani (2007), (43)	Descriptive-analytical	205	58	6/8	Included

Table 2: Demographic factors affecting sleep in heart failure patients

Demographic factors	Effective/Ref	Non-Effective
Gender (male/female)	(6, 11, 12, 16, 18, 24, 34-36, 38)	(13, 25)
Age	(2, 16, 22, 24, 28, 31, 34, 36, 41, 43)	(21, 25, 28)
educational level	(16, 20, 21, 28, 31, 36, 41)	(13)
Employment status (employed/unemployed)	(16, 21)	----
Marital status (single/married)	(23, 24).	----
Residency (rural/urban)	(31)	----
Income (low/middle/high)	(28, 38, 41)	(13)
Job	(16, 18, 21, 24)	----

Habits and lifestyle

Studies indicate that lifestyle factors such as napping (32), early morning wake-ups, bathing (37), using sleeping pills (2), smoking, and alcohol consumption affect sleep quality in heart failure patients (36, 44). However, these factors may not significantly impact sleep quality (7, 20, 25, 28). Obesity has been linked to poor sleep quality in some studies (2, 13, 25). Physical activity, unlike obesity, could be a recommended solution for sleep disorders in heart failure patients. Therefore, addressing these lifestyle factors is crucial for improving sleep quality in HF patients (38).

Psychological factors

Depression is a significant factor affecting sleep quality in HF patients (6, 7, 10, 11, 17, 20, 22, 23, 26, 29, 42, 45), with disrupted sleep being more common in depressive patients. Anxiety is also a useful indicator of impaired sleep quality (5, 17, 19, 23, 29, 31, 42). Other psychological factors contributing to poor sleep quality include dysfunctional beliefs (17, 23, 29), attitudes towards disease prognosis (31, 40), negative mental image (28), poor self-perceived health (6, 7), perceptions of disease prognosis (7, 31), and nightmares (18). These psychological determinants contribute to poor sleep quality in heart failure patients.

Physical health factors

Physical factors affecting sleep quality in heart failure patients include hospital admission (6, 16, 40), left ventricular ejection fraction (16, 34), heart function (6, 11, 12, 18, 34, 45), pain (5, 13, 18, 19, 21, 32, 46), enuresis (2, 6, 18, 30, 33), fatigue (10, 14, 15, 18, 20, 27, 30, 32, 45), respiratory problems (2, 18, 23, 47), length of hospital stay (6, 16), and drug use (6, 40). Other factors include comorbidities (6, 48), nocturnal heartbeat (47), and history of myocardial infarction (20, 21). A significant link was found between chronic obstructive pulmonary disease (COPD) and sleep quality in patients with heart failure (41). Enuresis was the most common cause of sleep disorders in hospitalized HF patients, and having a history of heart surgery was a predictor of sleep quality in HF patients (6, 18, 21, 31). Comorbidities, nocturnal heartbeat, and history of myocardial infarction also affect sleep quality (38).

Drugs

Sleep quality in heart failure patients is often affected by the use of angiotensin-converting enzyme inhibitors (2, 6, 23, 27, 31, 35), although Chen et al. (48) have shown no significant association between these medications and sleep quality. However, Zeighami Mohammadi found a statistically significant relationship between the use of these inhibitors and sleep quality in heart failure patients (41).

Sleep assessment tools

Previous studies have utilized various tools to evaluate sleep quality in HF patients, with the PSQI being the primary tool used in 21 studies. Other sleep quality assessment instruments include the Difficulty Initiating and Maintaining Sleep (DIMS) Scale, the Sleep Habits Questionnaire (SHQ), polysomnography, the Epworth Sleepiness Scale, Actigraphy, the Uppsala Sleep Inventory, sleep-disordered breathing (SDB), the Sleep Hygiene Awareness and Practice Scale (SHAPS), the Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16), and the Insomnia Severity Index (ISI).

Table 3: Summary Descriptive information of screening studies included

First author, Year (Ref)	Objective(s)	Sleep quality assessment tool(s)	Result
Redeker 2010, (10)	Evaluation of insomnia symptoms and their relationship with clinical and demographic characteristics and Daytime Function in Stable Heart Failure patients	1. Insomnia symptoms (DIMS), 2. Sleep Habits Questionnaire (SHQ) 3.Polysomnography(PSG)	Depression and fatigue in stable HF patients were significantly associated with excessive daytime sleepiness.
Jeon, 2020, (11)	Rest-activity rhythms, daytime symptoms, and functional performance among people with heart failure	1. Actigraphy 2.polysomnography (PSG)	Circadian rhythm changes impact fatigue, depression, drowsiness, heart function. PSQI scores vary between male and female heart failure patients.
Awotidebe, 2016, (12)	Evaluation of functional capacity and sleep quality in patients with chronic HF	Pittsburgh Sleep Quality Index (PSQI)	Female HF patients were more likely to poor sleep quality and functional capacity.
Chen, 2013, (13)	Excessive Daytime Sleepiness in Taiwanese HF patients	1. Epworth Sleepiness Scale 2. PSQI	There was an association between sleep disorders and daytime napping.
Conley, 2019, (32)	Determination of daytime and nighttime sleep characteristics and pain among adults with stable HF.	1. PSQI 2.Sleep Habits Questionnaire 3.Actigraphy 4.Polysomnography	There was a significant relationship between pain and total sleep time, poor sleep quality, insomnia symptoms, use of sleeping pills, frequent napping, daytime drowsiness, and fatigue.
Jorge-Samitier, 2020, (2)	Sleep Quality in HF Patients in the Spanish Population.	PSQI	"Enuresis linked to Respiratory Disorders" •Snoring and coughing. •Sleeping pills. • Poor sleep quality.
Lee, 2016, (14)	Prognostic importance of self-reported sleep quality in HF patients.	PSQI	%63"of participants experience poor sleep quality" Long sleepers, nonwhite, depressed more likely.
Redeker, 2005, (45)	Sleep and quality of life in stable HF patients.	1. Actigraphy 2. PSQI	"Sleep Quality and Duration in Stable Systolic Heart Failure Patients" •Improved heart function. • Improved mental health.
Redeker, 2012, (33)	Assessment of nocturia, sleep and daytime function in stable HF patients.	1. Polysomnography 2. Epworth Sleepiness 3. PSQI	"Stable Heart Failure Patients: Enuresis Severity, Sleep Decrease, Heart Function Decrease, Fatigue,

Table 3: Continued…

			Drowsiness"
Wang, 2007, (6)	Charactrization of the factors determining sleep quality if HF patients.	PSQI	Sleep Discontinuation Causes Enuresis as primary reason. Sleep quality factors: gender, health, depression, comorbidities, functional class, hospital stay, comorbidities, drugs used.
Broström, 2004, (35)	Investigation of sleep difficulties, daytime sleepiness, and health related quality of life in patients with chronic HF.	1. Epworth Sleepiness Scale 2. Uppsala Sleep Inventory	"Sleep Duration Differences" •Females sleep shorter. • Males wake up harder.
Riegel, 2012, (7)	Modifiable factors associated with sleep dysfunction in adults with heart failure.	PSQI	"Sleep Quality Unaffected by Smoking, Alcohol Consumption, Body Mass Index"
Moradi, 2014, (16)	Sleep quality and associated factors among with Iranian chronic HF patients	PSQI	PSQI Scores and Health Factors •Significant relationship between scores and age, gender, education, job status, hospital stay, referral type, nonheart disease, diuretic use, and left ventricular ejection fraction. • Daytime diuretic use recommended.
Matsuda, 2021, (29)	Psychological determinants of disrupted sleep quality in patients admitted for cardiovascular diseases	PSQI Sleep-disordered breathing (SDB)	Depression and anxiety were strongly associated with poor sleep quality but were not associated with sleep disordered breathing (SDB).
Santos, 2011, (18)	Factors associated with sleep pattern in heart failure patients	PSQI	Sleep Disorder Causes •Enuresis •Respiratory distress •Pain •Female gender •Unemployment •Fatigue •Shortness of breath • Severe heart failure functional issues.
Johansson 2012, (19)	The contribution of heart failure to increased sleep disturbances and depressive symptoms in older adults	Uppsala Sleep Inventory	"Sleep Disorders and Cardiopulmonary Symptoms" •Shortness of breath and nocturnal heartbeat. • Significant association with pain.

Table 3: Continued…

Nasir, 2015, (20)	Sleep quality and depression in hospitalized congestive HF patients	PSQI	Sleep Quality in Heart Failure Patients •Severe HF problems, female gender, education, job type, history of infarction, pain, fatigue linked to poor sleep quality. •No significant relationship between hypertension, smoking, diabetes, lower PSQI score.
Momayyezi, 2015, (21)	Comparison sleep quality in HF patients and healthy participants.	PSQI	"Demographics, Education, Job Type, Myocardial Infarction History, Pain, Fatigue, Sleep Quality" Enuresis most common nighttime awakening in HF patients.
Kanno, 2016, (22)	Prognostic significance of Insomnia in HF patients		"HF Patients' Insomnia Linked to Age, Gender, Diuretics/Inotropics Use, Psychiatric Disorders, Depression, Cognitive Disorders"
Janya, 2017, (23)	Determinants of Insomnia in HF patients	Sleep Hygiene Awareness and Practice Scale (SHAPS). Dysfunctional Beliefs and Attitudes about Sleep scale (DBAS-16). Insomnia Severity Index(ISI)	Predictors of Insomnia in Heart Failure Patients •Divorce/Wifehood •Moderate anxiety/depression •Severe shortness of breath • Dysfunctional sleep beliefs/attitudes.
Nasiry, 2018, (24)	Assessment of sleep quality and general health in patients with heart failure.	PSQI	Male Patients' Sleep Quality and Efficiency •Lower mental sleep quality and efficiency compared to females. •Higher sleep delay and disorders in males. • Marital status significantly associated with higher sleep quality.
Batool, 2020, (25)	Assessment of sleep quality and effective factors among congestive cardiac failure patients.	PSQI	Sleep Quality and Disease •Prolonged disease and high BMI linked. • Aging, smoking, gender unrelated.
Avcı 2021, (26)	The effect of daytime activities and depression symptoms level on sleep quality in the elderly with heart failure.	PSQI	Depression Symptoms and PSQI Score •Significant positive relationship.

Table 3: Continued…

			•Daytime activity fatigue negatively impacts sleep quality.
Hajj, 2020, (27)	Investigating sleep quality, fatigue, and quality of Life in individuals with HF	PSQI	Poor sleep quality was significantly associated with severe fatigue.
Goudarzian 2016, (28)	Determination of the effect of body image on sleep quality in Iranian patients with congestive HF.	PSQI	Sleep Quality and Body Image Relationship •Significant relationship between sleep quality and patient's body image. •No significant correlation between sleep quality scores, age, BMI, education, exercise, smoking, alcohol consumption, heart disease, depression history.
Matsuda, 2015, (17)	Determining the prevalence of poor sleep quality and its association with depression and anxiety scores in patients admitted for cardiovascular disease: A cross-sectional designed study.	PSQI	Depression, Anxiety, Poor Sleep Quality •Significant relationship between depression, anxiety, poor sleep quality. •Gender linked to poor sleep quality and depression. • Higher association with depression among females.
Lainsamputty, 2018, (30)	Investigating correlation between fatigue and sleep quality among patients with HF	PSQI	There was a significant relationship between fatigue and poor sleep quality.
Edmealem, 2020, (31)	Sleep quality and associated factors among patients with diabetes, hypertension, and HF in Ethiopia	PSQI	Sleep Quality and Disease Perception •Age, education level, residence, disease prognosis perception, anxiety. •Enuresis as most common sleep disorder cause.
Erickson, 2003, (34)	Symptoms of sleep disturbance in HF patients	A researcher-made questionnaire for assessment of sleep disorders	Married Patients' Sleep Issues •Difficulty waking up and light sleeping. •Male patients report more daytime napping difficulties. •Hypnotics and ejection fraction use not linked to sleep disorders.
Javadi 2014, (36)	Investigating the quality of sleep and its related factors in hospitalized patients with HF	PSQI	Sleep Quality in Heart Failure Patients • Age, gender, education level. • Smoking, obesity.

Table 3: Continued…

Gharaibeh 2023, (37)	Evaluation of sleep disorders in different classes of HF	PSQI	Sleep Quality Factors •Urination waking up. •Midnight or early morning wake-ups. •Coughing and snoring wake-ups. • Difficulty falling asleep within 30 min.
Esnaashari eh 2022, (38)	Investigating the relationship between physical activity and sleep quality in heart failure patients.	PSQI	Sleep Quality and Physical Activity • Significant inverse relationship between sleep quality and physical activity. • Improved sleep quality with increased activity. •Predictors include physical activity, gender, heart surgery history, disease stage.
Kania 2022, (39)	Identifying the parameters associated with poor sleep quality in HF patients with Obstructive Sleep Apnea	(PSQI), the Epworth Sleepiness Scale (ESS)	Female sex and coexistence of heart failure are predictors of poor sleep quality.
Xiong 2023, (40)	Assessment of sleep quality and its relationship with fear of disease progression in patients with chronic heart failure	PSQI	Impaired Sleep Quality Predictors: • Hospitalization history • High number of HF medications • Monthly income • Fear of disease progression
zeighami Mohammadi 2013, (41)	Evaluation of Sleep Problems and Its Associated Factors in Male Patients with Systolic Heart Failure	(PSQI), the Epworth Sleepiness Scale (ESS), Sleep Disorder Scale,	"Sleep Quality in Heart Failure Patients" • Chronic obstructive pulmonary disease, angiotensin converting enzyme drugs. • Age, income, BMI, education, smoking.
Aslani 2007, (43)	Studying the spectrum of sleep disorders in patients with heart failure hospitalized in the heart department of Hajar Shahrekord Hospital in 2013	A researcher-made questionnaire for assessment of sleep disorders	Women's Sleep Disorders • Frequency of sleep disorders higher in women ($p < 0.001$). • Age doesn't significantly affect sleep disorder scores. • Increase in teeth grinding and snoring with age ($0.05>p$).
Aria 2017, (42)	investigate the relationship between sleep quality, anxiety, and depression in patients with heart failure	PSQI	Factors like anxiety and depression significantly correlating with poor sleep.

Discussion

This systematic review aimed to identify the factors affecting sleep quality in HF patients. Briefly, most studies have used PSQI scores to assess sleep quality in HF patients. In addition, the main sleep disorders in HF patients are respiratory problems and apnea. We also classified sleep quality factors into personal, physical, psychological, and lifestyle factors.

Sleep quality in heart failure patients is influenced by various factors such as age, sex, marital status, residency, economic status, job, and education (49). Females tend to have a higher prevalence of sleep disorders due to psychological issues and menopause, which can worsen sleep quality, especially in elderly patients (21). Short-sleeper women are more likely to sleep longer than men, but more male patients report daytime drowsiness and nighttime awakenings (16, 20). Age is a significant factor in sleep quality, as heart failure occurs in old age (2, 16, 22, 24, 43, 50). Emotional stress (43) and physical problems also contribute to sleep disorders in older individuals (49, 51). Overall, factors such as age, sex, marital status, residency, economic status, job, and education play crucial roles in determining sleep quality in HF patients.

Two studies found a correlation between economic and education status and sleep quality (52, 53), but Chen et al. (13) and Liu et al.'s (54) findings did not. Other studies suggest financial worries (55), physical and health issues, marital status, and chronic diseases contribute to poor sleep quality, particularly in older individuals (24, 56).

Habit and lifestyle

Smoking in HF patients is linked to impaired sleep quality (36), with nicotine causing insomnia and increased sleep disorders (36). However, this relationship was not statistically significant in two studies (20, 28). Coffee consumption negatively impacts sleep duration and efficiency (21), while alcohol consumption is associated with short sleep and snoring (31). Other sleep-disrupting factors include insomnia, daytime sleepiness, obstructive sleep apnea, and obesity (57). Exercise is also associated with better sleep quality (28, 38), while obesity is a significant sleep-disrupting factor in HF patients, as it often leads to respiratory problems (28). Higher BMI is frequently associated with poor sleep quality in HF patients, as reported in previous studies (2, 6, 25, 28, 36, 52). These factors highlight the importance of addressing sleep quality in HF patients.

Psychological factors

Research shows a strong association between mental health status and sleep quality (58), with psychological factors like depression, anxiety, and disturbing dreams disrupting sleep and contributing to sleep disorders (6, 7, 10, 11, 17, 20, 22, 23, 26, 29, 45). Depression is particularly prevalent in HF patients, with studies showing it as a predictive factor for poor sleep quality in individuals with acute myocardial infarction (59). Self-perceived health status also significantly influences sleep quality (6), with patients' attitudes about their disease prognosis (31) and sleep patterns reflecting their mental health and cognitions (23). Additionally, body image is significantly influenced by sleep quality (28), with chronic HF patients with poor sleep quality often exhibiting poor body image (40).

Physical health factors

Enuresis, overactivation of the bladder, and nocturnal polyuria are common physical problems that negatively impact sleep quality in HF patients (2, 6, 18, 21, 30, 33). These conditions can lead to death and distress, with one-third of these patients waking up three times at night to urinate (21, 37, 60). Elderly HF patients often have a low threshold for pain, which disrupts sleep. Pain is common in HF patients, with chest and knee pain being the main complaints (5, 18-21, 32, 46, 47). Fatigue is another significant factor affecting sleep quality, as it reduces daily activity in patients with poor heart function, reducing excessive sleepiness and daytime drowsiness (10, 11, 21, 27, 30, 32, 33). Daytime napping can improve sleep

quality, with the duration and number of naps being crucial factors (13).

Sleep assessment tools

In this systematic review, subjective tools like the ISI and Pittsburgh Sleep Quality Index (PSQI), as well as actigraphy and polysomnography, were used to assess sleep quality in HF patients. The PSQI was the most common tool, used in 21 of the 29 studies. While the PSQI is a brief and convenient assessment, it has been criticized for evaluating sleep quality over the past month. This may have led to more positive estimates of sleep quality at home compared to the hospital (46). Additionally, some studies found no significant association between perceived and PSQI-estimated sleep quality (2, 14, 16), possibly due to the extended time HF patients spend in bed (2). The authors recommend developing a standard sleep assessment questionnaire tailored for heart failure patients.

Limitations

The study's limitations include the use of different sleep quality assessment tools across studies; have contributed to the varied results. Access to all databases was not possible, and the wide range of included studies prevented focusing on confounding variables. Future studies could consider these limitations.

Conclusion

The study found poor sleep quality in HF patients due to various factors, including physiological, physical, individual, habit, and lifestyle factors. Depression, fatigue, female sex, and high BMI were identified as significant subcategories. The study recommends developing a specific HF patient questionnaire and implementing programs to improve sleep quality, focusing on factors like diuretics and emotional adjustment skills. Future research should explore cultural and social influences on sleep quality and design interventions for improved sleep hygiene and pain reduction. Larger sample sizes and control for confounding factors would improve the methodological quality of studies and facilitate meta-analyses to identify factors influencing sleep quality in HF patients.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Data availability statement

The data that support the findings of this study are available from Mashhad University of Medical Sciences. Restrictions apply to the availability of these data, which were used under license for this study.

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Conflict of interest

The authors declare that there is no conflict of interests.

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