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IZVORNI ČLANAK / ORIGINAL ARTICLE

Kvaliteta spavanja medicinskih dispečera: presječno istraživanje

Sleep quality of medical dispatchers: cross-sectional study

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Sažetak

Uvod: Medicinski dispečeri imaju ključnu ulogu u pružanju stručne medicinske pomoći putem telefona, pružajući podršku i usmjeravanje pozivateljima u situacijama opasnima po život. Budući da dispečerska služba djeluje neprekidno, zaposlenici rade u smjenama. Cilj je ovog rada istražiti kvalitetu spavanja medicinskih dispečera koji obavljaju smjenski rad. Istraživanje doprinosi proširenju spoznaja o učincima smjenskog rada na san u ovom specifičnom i nedovoljno istraženom profesionalnom kontekstu.

Metode: Presječno istraživanje uključivalo je namjensko uzorkovanje za provođenje anketnog upitnika među medicinskim dispečerima u medicinskoj dispečerskoj službi koji obavljaju smjenski rad. Podaci su prikupljeni između srpnja i kolovoza 2023. godine pomoću anketnog upitnika Scale Quality Scale koji ocjenjuje šest područja kvalitete spavanja u proteklih mjesec dana: dnevna disfunkcija, oporavak nakon spavanja, poteškoće pri usnivanju, poteškoće prilikom ustajanja, zadovoljstvo snom i poteškoće u održavanju sna. Podaci su obrađeni i analizirani pomoću programa IBM SPSS Statistics 29. Upotrjebljena je deskriptivna i inferencijalna statistika.

Rezultati: U istraživanju je sudjelovalo 59 dispečera; 52,50 % njih ocijenilo je svoju kvalitetu sna kao lošu. Najviša prosječna ocjena zabilježena je za tvrdnju „Nakon spavanja, moje misli su sabrane" (M = 1,81), a podljestvica s najvišom ocjenom bila je dnevna disfunkcija (M = 9,86; SD = 6,88). Podljestvice oporavka nakon spavanja (M = 5,66), poteškoća kod ustajanja (M = 4,17) i zadovoljstva snom (M = 3,70) također su bile izraženije, dok su najniže ocjene zabilježene za održavanje sna (M = 2,71) i usnivanje (M = 3,29). Nisu utvrđene statistički značajne razlike u ukupnoj kvaliteti sna u odnosu na dob, spol i radni staž.

Rasprava i zaključak: Više od polovice dispečera percipira svoj san kao loš, pri čemu dominira dnevna disfunkcija kao najizraženije područje poremećaja. Rezultati ukazuju na potrebu za specifičnim intervencijama, poput optimizacije rasporeda smjena i edukacije o higijeni sna, kako bi se smanjio negativan utjecaj smjenskog rada na njihovo svakodnevno funkcioniranje.

Ključne riječi: kvaliteta sna, medicinski dispečeri, smjenski rad

Kratak naslov: Kvaliteta spavanja dispečera

Abstract

Introduction: Medical dispatchers play a crucial role in providing professional medical assistance over the phone, offering support and guidance to callers in life-threatening situations. Since the dispatch service operates continuously, employees work in shifts. This study aims to investigate the sleep quality of medical dispatchers who work shifts. The research contributes to expanding knowledge about the effects of shift work on sleep in this specific and understudied professional context.

Methods: A cross-sectional study involved purposive sampling to survey medical dispatchers working in shift-based roles at the medical dispatch service. Data were collected between July and August 2023 using the Sleep Quality Scale questionnaire, which assesses six areas of sleep quality over the past month: Daytime dysfunction, Restoration after sleep, Difficulty falling asleep, Difficulty getting up, Satisfaction with sleep, and Difficulty maintaining sleep. The data were processed and analysed using IBM SPSS Statistics 29. Data were processed and analysed using IBM SPSS Statistics 29, employing descriptive and inferential statistics.

Results: 59 dispatchers participated in the study; 52.5% rated their sleep quality as poor. The highest average score was recorded for the statement I have a clear head after sleep (M = 1.81). The subscale with the highest score was Daytime dysfunction (M = 9.86; SD = 6.88). Other prominent subscales included Restoration after sleep (M = 5.66), Difficulty in getting up (M = 4.17), and Satisfaction with sleep (M = 3.70). The lowest scores were observed for Difficulty in maintaining sleep (M = 2.71) and Difficulty in falling asleep (M = 3.29). No statistically significant differences in overall sleep quality were found by age, gender, or years of service.

Discussion and Conclusion: More than half of the dispatchers perceive their sleep as poor, with daytime dysfunction emerging as the most pronounced area of disturbance. The findings indicate a need for targeted interventions, such as optimising shift schedules and educating about sleep hygiene, to mitigate the negative impact of shift work on their daily functioning.

Keywords: sleep quality, medical dispatchers, shift work

Short title: Sleep Quality of Dispatchers

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Uvod

Spavanje je prirodno i reverzibilno stanje koje pripada vrlo važnom dijelu života svakog pojedinca [1]. Uglavnom je kontrolirano neurobiološkim procesima te je fiziološki dio ljudskog života koji je neophodan za održavanje zdrav-

Introduction

Sleep is a natural, reversible state that plays a crucial role in everyone's life [1]. Neurobiological processes primarily regulate it and are an essential physiological aspect of human life for maintaining health and well-being [2, 3]. Good sleep

lja i dobrobiti [2, 3]. Dobar san nužan je za dobro fizičko i psihičko zdravlje te kvalitetan život. Nedovoljno je sna sveprisutno među ljudima i predstavlja velik problem suvremenog društva [4]. Kvalitetan san može utjecati na svakodnevno funkcioniranje, mentalno zdravlje, kreativnost i radnu učinkovitost. Ako je san prekratak ili neučinkovit, to može utjecati na pojedinca i njegovu dnevnu pospanost, ponašanje, razdražljivost, emocionalni stres, a može čak povećati mogućnost nesreća [5]. Spavanje ima multifaktorski učinak na tijelo jer smanjuje potrošnju energije, povećava skladištenje energije u mozgu, regulira adaptivne i urođene imunološke odgovore te doprinosi konsolidaciji pamćenja [6, 7].

Medicinska dispečerska služba vrlo je važna za učinkovito funkcioniranje sustava hitne medicinske pomoći [8] i pripada novim područjima prakse i istraživanja [9]. U medicinskoj dispečerskoj službi radi se kontinuirano, svaki dan u godini, dvadeset i četiri sata dnevno, što znači da se radi u smjenama. Rad u smjenama rad je pojedinca izvan uobičajenog radnog vremena, pri čemu se definira kao rad od 09:00 do 17:00 sati [10] i obično ima dugotrajne noćne smjene i radni raspored u kojem radnici izmjenjuju smjene [11].

Smjenski rad, posebice noćni, može utjecati na stanje spavanja i budnosti, to jest, na cirkadijalni ritam [10]. Cirkadijalni ritam, reguliran suprahijazmatskom jezgrom hipotalamusa, neophodan je za dobro ljudsko zdravlje. Kod radnika koji rade noćnu smjenu cirkadijalni ritam može biti poremećen, što može negativno utjecati na zdravlje pojedinca [12]. Fiziološki, smjenski rad zahtijeva raspored spavanja i budnosti koji je redovito u sukobu s prirodnim, endogenim ritmom spavanja i budnosti [13]. Radnici u smjenama imaju veću prevalenciju nesanice i mentalnih poremećaja u usporedbi s radnicima koji ne rade u smjenama [14].

Poremećaji spavanja pojavljuju se kod radnika u smjenama zbog poremećaja cirkadijalnog ritma i uzrokuju hormonske poremećaje nekoliko hormona, uključujući melatonin i kortizol, što dovodi do povećanog rizika od metaboličkog sindroma kao što su pretilost i dijabetes tipa 2. Radnici u smjenama imaju povećan broj bijelih krvnih stanica – leukocita, u usporedbi s radnicima koji ne rade u smjenama, što može utjecati na imunitet. Osim toga, rad u smjenama može uzrokovati probleme na molekularnoj ili hormonalnoj razini, što svakodnevno utječe na funkcioniranje čovjeka [15]. Smjenski rad povezan je s poremećenim cirkadijalnim ritmom i nije samo rizični čimbenik za nastanak raka dojke već je i rizični čimbenik za razvoj kardiovaskularnih bolesti, moždanog udara, akutnih respiratornih infekcija, gastrointestinalnih problema, menstrualnih problema, bolova u leđima, glavobolje, tjeskobe, poremećaja raspoloženja i depresije [17, 18, 19, 20, 21]. Radnici u noćnoj smjeni također imaju veći rizik od hipertenzije [19]. Pojedini su autori istražili da zapošljavanje medicinskih dispečera uključuje smjenski rad koji je povezan s povećanim zdravstvenim rizicima kao što su povećane stope raka, pretilost, kardiovaskularne bolesti, arterijska hipertenzija, lošija kvaliteta sna, izgaranje, depresija i anksioznost [22, 23].

Smjenski rad ne utječe isključivo na fiziološke aspekte spavanja već i na neurokognitivno funkcioniranje [40]. Medicinski dispečeri dodatno su izloženi visokom psihološkom

is necessary for physical and mental health and a high quality of life. Insufficient sleep is widespread and a significant issue in modern society [4]. Quality sleep can affect daily functioning, mental health, creativity, and work efficiency. Sleeping too little or poorly can affect individuals by increasing daytime sleepiness, altering behavior, causing irritability and emotional stress, and even increasing the risk of accidents [5]. Sleep has multifactorial effects on the body as it reduces energy consumption, increases energy storage in the brain, regulates adaptive and innate immune responses, and contributes to memory consolidation [6, 7].

Medical dispatching is essential for the efficient functioning of the emergency medical system [8] and is an emerging field of practice and research [9]. As a continuous operation, medical dispatching is performed on a shift work basis, 24 hours a day, 7 days a week, 365 days a year. Shift work involves working outside regular hours, typically defined as 09:00 AM to 05:00 PM [10], and often includes long nights and rotating shifts [11].

Shift work, particularly night shifts, can disrupt sleep-wake patterns, also known as circadian rhythms [10]. The suprachiasmatic nucleus of the hypothalamus regulates these rhythms necessary for good health. These rhythms may be disrupted in night-shift workers, negatively impacting their health [12]. Physically, shift work necessitates a sleep-wake schedule that frequently conflicts with the body's natural sleep-wake rhythm [13]. Compared to non-shift workers, shift workers have a higher prevalence of insomnia and mental disorders [14]. Circadian rhythm disruption causes sleep disorders in shift workers. It leads to hormonal imbalances, including those affecting melatonin and cortisol, therefore increasing the risk of metabolic syndrome, including obesity and type 2 diabetes. Shift workers tend to have higher levels of white blood cells, or leukocytes, compared to non-shift workers, which may influence their immune function. Additionally, shift work can lead to molecular or hormonal imbalances that affect daily functioning in humans [15]. Disrupted circadian rhythms associated with shift work are a risk factor not only for breast cancer but also for cardiovascular disease, stroke, acute respiratory infections, gastrointestinal problems, menstrual problems, back pain, headaches, anxiety, mood disorders, and depression [17, 18, 19, 20, 21]. Night shift workers also have a higher risk of hypertension [19]. Some authors have investigated that employment of medical dispatchers involves shift work, which is associated with increased health risks, such as increased rates of cancer, obesity, cardiovascular disease, arterial hypertension, poorer sleep quality, burnout, depression, and anxiety [22, 23].

Shift work affects not only the physiological aspects of sleep, but also neurocognitive functioning [40]. Medical dispatchers face additional psychological stress due to the need for quick decision-making, constant verbal communication, managing high-pressure situations, and carrying a significant sense of responsibility [41]. These demands further exacerbate the impact of shift work on sleep quality.

Taking preventive measures to reduce psychosocial stress at work, such as providing family and social support and improving the work environment, can alleviate sleep prob-

opterećenju zbog potrebe za brzim donošenjem odluka, neprekidne verbalne komunikacije, upravljanja stresnim situacijama i velikog osjećaja odgovornosti [41]. Takvi zahtjevi dodatno pogoršavaju utjecaj smjenskog rada na kvalitetu sna.

Preventivne mjere za smanjenje psihosocijalnog stresa na poslu, poput podrške obitelji, socijalne podrške i boljeg radnog okruženja, mogu smanjiti probleme sa spavanjem, a radnik može doživjeti veću učinkovitost i produktivnost tijekom radnog vremena [16].

Kao i u gotovo svim područjima zdravstva, smjenski rad također se obavlja u medicinskoj dispečerskoj službi. Rad se izvodi na način da je radnik prvog dana na poslu dvanaest sati tijekom dana (od 07:00 do 19:00 sati), a sljedeći dan dvanaest sati noću (od 19:00 do 07:00 sati). Nakon toga slijedi 48 sati odmora. Izvođenjem smjenskog rada redovito se mijenja bioritam u tijelu pojedinca, što sve zajedno utječe na koncentraciju zaposlenika, kao i na točnost i dosljednost.

S obzirom na navedeno, cilj je ovog rada bio istražiti kvalitetu spavanja medicinskih dispečera koji obavljaju smjenski rad.

Metode

Upotrebljena je kvantitativna metodologija rada. Proveli smo presječno opservacijsko istraživanje, a podaci su prikupljeni putem anketnog upitnika.

Korišten je validirani anketni upitnik *Sleep Quality Scale* (SQS) [24] koji se odnosi na kvalitetu sna pojedinca, odnosno procjenjuje šest područja kvalitete sna u proteklih mjesec dana: *dnevna disfunkcija, oporavak nakon spavanja, poteškoće u usnivanju, poteškoće kod ustajanja, zadovoljstvo snom i poteškoće u održavanju sna.* SQS-upitnik sadrži 28 tvrdnji koje su raspoređene u gore navedena područja tj. podljestvice. Ispitanici tvrdnje ocjenjuju pomoću skale od četiri stupnja Likertova tipa, u kojoj navode koliko često doživljavaju određena ponašanja tijekom spavanja (0 = rijetko, 1 = ponekad, 2 = često i 3 = gotovo uvijek). Prije zbrajanja rezultata pridržavali smo se uputa za SQS-upitnik jer su neke tvrdnje (tvrdnje 2, 8, 13, 16, 18, 20 i 27) bile ocjenjivane obrnutim redoslijedom. Viši rezultati upitnika upućuju na nižu kvalitetu sna [24]. Prije implementacije upitnika dobili smo suglasnost autora. Prilikom izračunavanja dobre ili loše kvalitete sna izračunali smo prosječnu vrijednost minimalnog i maksimalnog ukupnog rezultata upitnika koja je iznosila M = 30,97, što je bila granična vrijednost za dobru ili lošu kvalitetu sna. Korištena je bila deskriptivna i inferencijalna statistika. Razlike numeričkih varijabli testirane su Mann-Whitney U testom pri usporedbi kvalitete sna između muškaraca i žena. Korelacija između dobi i ukupne ocjene kvalitete sna, kao i između radnog staža i kvalitete sna testirana je Spearmanovim testom. Sve P vrijednost dvostrane su, a razina značajnosti postavljena je na Alpha (α) = 0,05. Također smo izračunali srednju vrijednost i interkvartilni raspon tvrdnji sadržanih u SQS-upitniku. Vraćeni i ispravno ispunjeni anketni upitnici bili su obrađeni i analizirani pomoću programa IBM SPSS Statistics, verzija 29.

lems and increase workers' efficiency and productivity during working hours [16].

In many areas of healthcare, shift work is a common practice, including in medical dispatch services. Employees typically work twelve-hour shifts: from 07:00 to 19:00 on one day and from 19:00 to 07:00 the following day. After these shifts, employees have 48 hours of rest. Consistently working these shifts alters the body's biorhythm, which can negatively impact the employee's concentration, accuracy, and overall performance.

Given the above, this study aimed to investigate the sleep quality of medical dispatchers engaged in shift work.

Methods

A quantitative work methodology was used. We conducted a cross-sectional observational study, collecting data through a questionnaire.

The validated Sleep Quality Scale (SQS) questionnaire [24] was used to assess an individual's sleep quality over the past month in six areas: *Daytime dysfunction, Restoration after sleep, Difficulty in falling asleep, Difficulty in getting up, Satisfaction with sleep,* and *Difficulty in maintaining sleep*. The SQS questionnaire contains 28 statements divided into these areas, or subscales. Respondents rate these statements using a four-point Likert scale, indicating how often they experience certain behaviours during sleep (0 = "rarely", 1 = "sometimes", 2 = "often", and 3 = "almost always"). Before summarising the results, we followed the instructions for the SQS questionnaire, as some of the statements (2, 8, 13, 16, 18, 20, and 27) were rated in reverse order. Higher scores on the questionnaire indicate poorer sleep quality [24]. We obtained the author's consent before implementing the questionnaire. When calculating good or poor sleep quality, we found that the average total questionnaire score was M = 30.97, the cut-off value. Descriptive and inferential statistics were used. Differences in numerical variables were tested using the Mann-Whitney U Test to compare sleep quality between men and women. Spearman's rank-order correlation test was used to test the correlation between age and the total sleep quality score and between years of employment and sleep quality. All p-values are two-sided, and the significance level was set at α = 0.05. We also calculated the mean and interquartile range of the statements contained in the SQS questionnaire. The correctly completed questionnaires were processed and analysed using IBM SPSS Statistics, version 29.

As the study was conducted exclusively by the institution's employees, with no interventions or collection of sensitive personal data, ethical approval was not required according to the institution's rules. Before the study began, written consent was obtained from the institution. Respondents were informed of the study's objectives and that all data would be processed objectively and anonymously for research purposes only. By returning the completed questionnaire, the respondents were considered to have given informed consent to participate. The Declaration of Helsinki [42] and the Slovenian Code of Ethics for Nurses [43] were adhered to throughout the study.

Budući da su u istraživanju sudjelovali isključivo zaposlenici ustanove, bez intervencija ili prikupljanja osjetljivih osobnih podataka, prema pravilima ustanove nije bilo potrebno tražiti etičku suglasnost. Prije provedbe istraživanja pribavljena je pisana suglasnost ustanove u kojoj je istraživanje provedeno. Ispitanici su bili upoznati s ciljevima istraživanja te su informirani da će svi podaci biti obrađeni objektivno, anonimno i isključivo u istraživačke svrhe. Povratom ispunjenog upitnika smatralo se da su dali informirani pristanak za sudjelovanje. Tijekom provođenja istraživanja poštovana je Helsinška deklaracija [42] te Kodeks etike u zdravstvenoj njezi Slovenije [43].

Primijenjeno je namjerno uzorkovanje, a u istraživanje su bili uključeni medicinski dispečeri zaposleni u medicinskoj dispečerskoj službi u Sloveniji. Uključeni kriteriji bili su: stalno zaposlenje u dispečerskoj službi, obavljanje smjenskog rada te voljnost za sudjelovanje. Isključni kriteriji bili su: radnici na bolovanju ili na godišnjem odmoru tijekom razdoblja prikupljanja podataka.

Upitnik je distribuiran među 72 zaposlenika, a ukupno je prikupljeno 59 pravilno ispunjenih upitnika. Informacija o broju osoba koje su odbile sudjelovanje ili nisu vratile upitnik nije zabilježena.

Rezultati

U kvantitativnom istraživanju sudjelovalo je 59 medicinskih dispečera koji su zaposleni u medicinskoj dispečerskoj službi. Stopa odgovora bila je 82 %. Demografski podaci i karakteristike sudionika prikazani su u Tablici 1.

Tablica/Table 1. Demografske karakteristike uzorka / Demographic characteristics of the sample

Spol	**n (%)**	
ženski	33 (55,90)	
muški	26 (44,10)	
Ukupno	59 (100,00)	
	M (SD)	**Md (IQR)**
Dob	36,17 (6,50)	
Radni vijek		3,47 (0,50–7,00)

M = aritmetička sredina, SD = standardna devijacija, Md = mediana, IQR = interkvartilni raspon, n = broj sudionika / M = arithmetic mean, SD = standard deviation, Md = median, IQR = interquartile range, n = number of participants

Prije popunjavanja navedenih tvrdnji o kvaliteti sna u anketnom upitniku, ispitanicima smo postavili pitanje o vlastitoj percepciji utjecaja smjenskog rada na kvalitetu sna. Ukupno 44 ispitanika (74,60 %) složila su se da smjenski rad utječe na kvalitetu sna, dok njih 15 (25,40 %) ne smatra da smjenski rad utječe na njihovu kvalitetu sna.

Unutarnja konzistencija mjerena je za prevedeni SQS-upitnik na slovenski jezik. Cronbachova alfa za SQS-upitnik bila je 0,89, što ukazuje na visok stupanj unutarnje konzisten-

Purposive sampling was used, and the research included medical dispatchers from the Medical Dispatch Service in Slovenia. The inclusion criteria were: dispatch service employment, shift work, and willingness to cooperate. Those excluded were workers on sick leave or holiday during the data collection period.

Fifty-nine correctly completed questionnaires were collected from the 72 employees who received the questionnaire. Information on those who refused to participate or did not return the questionnaire was not recorded.

Results

In the quantitative study, 59 medical dispatchers employed in the medical dispatch service participated. The response rate was 82%. Demographic data and characteristics of the participants are presented in Table 1.

Before completing the statements regarding sleep quality in the survey questionnaire, we asked participants to share their perceptions of the impact of shift work on sleep quality. Forty-four participants (74.6%) agreed that shift work affects sleep quality, while 15 participants (25.4%) did not believe that shift work affects sleep quality.

Internal consistency was measured for the SQS questionnaire translated into the Slovenian language. Cronbach's alpha for the SQS questionnaire was 0.89, indicating high internal consistency. The Cronbach's alpha for the six SQS subscales ranged from 0.59 to 0.89 for five subscales, indicating varying degrees of internal consistency ranging from poor to good. Only one subscale differed, relating to difficulty in getting up. Its internal consistency was 0.27.

The highest-rated statements were: *I have a clear head after sleep* (M = 1.81), *I fall into a deep sleep* (M = 1.64), and *I feel unlikely to sleep after sleep* (M = 1.49). The lowest-rated statements were: *Poor sleep makes me lose my appetite* (M = 0.32), *I never go back to sleep after awakening during sleep* (M = 0.38), and *Poor sleep causes me to make mistakes at work* (M = 0.46). Table 2. shows the descriptive statistics for all statements.

The highest-rated subscale was *Daytime dysfunction* (M = 9.86; SD = 6.88). The subscales *Restoration after sleep* (M = 5.66; SD = 2.91), *Difficulty in getting up* (M = 4.17; SD = 1.85), and *Satisfaction with sleep* (M = 3.70; SD = 2.28) were rated as moderately high. The lowest values were recorded for subscale *Difficulty in falling asleep* (M = 3.29; SD = 2.21) and *Difficulty in maintaining sleep* (M = 2.71; SD = 1.70).

Twenty-eight (47.5%) medical dispatchers rated their sleep quality as good, while 31 (52.5%) rated it as poor.

No statistically significant differences were found between demographic characteristics and the overall sleep quality score (SQS) and its subscales. The correlation between age and the overall sleep quality score was negative or insignificant ($r_s = -0.14$; $p = 0.283$), as was the correlation between years of service and the overall sleep quality score ($r_s = 0.07$; $p = 0.560$). Furthermore, the Mann-Whitney U Test revealed no significant difference in sleep quality between men and women ($U = 442.0$; $p = 0.849$). These results indicate that age, gender, and years of service did not significantly influ-

cije [25]. Cronbachova alfa za šest SQS-podljestvica bila je između 0,59 i 0,89 kod pet podljestvica, pokazujući različite stupnjeve unutarnje konzistencije, u rasponu od loše do dobre. Samo se jedna podljestvica razlikovala, što se odnosi na poteškoće kod ustajanja. Tu je unutarnja konzistencija bila samo 0,27.

Najbolje ocijenjene tvrdnje bile su: *Nakon spavanja, moje misli su sabrane* (M = 1,81), *Padam u dubok san* (M = 1,64), i *Kad se dovoljno naspavam, malo je vjerojatno da ću više spavati* (M = 1,49). Najgore ocijenjene tvrdnje bile su: *Zbog lošeg sna gubim apetit.* (M = 0,32), *Nikad ne zaspim ponovo kad se probudim iz sna* (M = 0,38) i *Zbog lošeg sna radim greške na poslu* (M = 0,46). U Tablici 2. možemo vidjeti deskriptivnu statistiku svih tvrdnji.

ence the subjective assessment of sleep quality among our sample of medical dispatchers.

Discussion

This study investigates the sleep quality of medical dispatchers performing shift work. In line with previous studies, the results show that over half of the respondents subjectively rate their sleep quality as poor. Other authors have also investigated the prevalence of poorer sleep quality [26, 27, 28, 29, 30, 31], and some have found that sleep quality is better among healthcare workers who work fixed shifts [32].

Tablica/Table 2. Deskriptivna statistika tvrdnji / Descriptive statistics of statements

Tvrdnja	n	M (SD)	Md (IQR)
1. Teško zaspim.	59	0,83 (0,85)	1,00 (0–1)
2. Padam u dubok san.	59	1,64 (0,98)	2,00 (1–2)
3. Tijekom sna se budim.	59	1,24 (0,88)	1,00 (1–2)
4. Ako se probudim usred noći, teško ponovno zaspim.	59	0,88 (0,98)	1,00 (0–2)
5. Zbog buke se lako probudim.	59	1,47 (1,04)	1,00 (1–2)
6. Tijekom sna se okrećem i prevrćem.	58	1,21 (0,87)	1,00 (1–2)
7. Nikad ponovno ne zaspim kad se probudim iz sna.	59	0,38 (0,62)	0,00 (0–1)
8. Nakon spavanja osjećam se odmorno.	59	1,36 (0,9)	1,00 (1–2)
9. Malo je vjerojatno da ću više spavati kad se dovoljno naspavam.	59	1,49 (1,09)	1,00 (1–2)
10. Loš san uzrokuje mi glavobolju.	58	0,98 (1,05)	1,00 (0–2)
11. Zbog lošeg sna sam razdražen/a.	59	1,20 (0,89)	1,00 (1–2)
12. Željela/želio bih spavati dalje kad se probudim.	59	1,49 (0,95)	1,00 (1–2)
13. Spavam dovoljno sati dnevno.	59	0,90 (0,96)	1,00 (0–2)
14. Zbog lošeg sna gubim apetit.	59	0,32 (0,68)	0,00 (0–0)
15. Zbog lošeg sna teže razmišljam.	59	1,15 (0,87)	1,00 (1–2)
16. Nakon spavanja osjećam se živahno.	59	1,03 (0,83)	1,00 (0–1)
17. Loš san mi uzrokuje gubitak interesa za posao ili druge stvari.	59	1,03 (0,89)	1,00 (0–2)
18. Umor prolazi sa snom.	59	1,44 (1,06)	1,00 (1–2)
19. Zbog lošeg sna radim greške na poslu.	59	0,46 (0,57)	0,00 (0–1)
20. Zadovoljan/zadovoljna sam svojim snom.	59	1,15 (1,01)	1,00 (0–2)
21. Zbog lošeg sna zaboravljam stvari.	59	0,81 (0,88)	1,00 (0–1)
22. Zbog lošeg sna teže se koncentriram na posao.	59	0,81 (0,90)	1,00 (0–1)
23. Pospanost ometa moj svakodnevni život.	59	0,86 (0,90)	1,00 (0–1)
24. Zbog lošeg sna izgubim volju za sve.	59	0,66 (0,82)	0,00 (0–1)
25. Teško mi je ustati iz kreveta.	59	1,19 (0,90)	1,00 (1–2)
26. Zbog lošeg sna brzo se umaram na poslu.	59	0,64 (0,84)	1,00 (0–1)
27. Moje misli su sabrane nakon spavanja,.	58	1,81 (1,00)	2,00 (1–3)
28. Loš san mi otežava život.	59	0,71 (0,83)	1,00 (0–1)

M = aritmetička sredina, SD = standardna devijacija, Md = mediana, IQR = interkvartilni raspon, n = broj sudionika / M = arithmetic mean, SD = standard deviation, Md = median,
IQR = interquartile range, n = number of participants

Najviše ocijenjena podljestvica bila je *Dnevna disfunkcija* (M = 9,86; SD = 6,88) nakon koje slijedi podljestvica *Oporavak nakon spavanja* (M = 5,66; SD = 2,91*). Poteškoće kod ustajanja* (M = 4,17; SD = 1,85) i *Zadovoljstvo snom* (M = 3,70; SD = 2,28) bile su ocijenjene srednje visoko. Najniže vrijednosti zabilježene su kod podljestvica *Poteškoće pri usnivanju* (M = 3,29; SD = 2,21) te *Poteškoće u održavanju sna* (M = 2,71; SD = 1,70).

Ukupno 28 (47,50 %) medicinskih dispečera ocijenilo je kvalitetu sna kao dobru, a 31 dispečer (52,50 %) lošom.

U analizi povezanosti demografskih obilježja s ukupnom ocjenom kvalitete sna (SQS) i njezinih podljestvica nisu utvrđene statistički značajne razlike. Korelacija između dobi i ukupne ocjene kvalitete sna bila je negativna ili neznačajna (r_s = -0,14; p = 0,283), kao i između radnog staža i kvalitete sna (r_s = 0,07; p = 0,560). Također, Mann-Whitneyjevim U testom nije utvrđena značajna razlika u kvaliteti sna između muškaraca i žena (U = 442,0; p = 0,849). Ovi rezultati ukazuju na to da dob, spol i radni staž nisu imali značajan utjecaj na subjektivnu procjenu kvalitete sna u našem uzorku medicinskih dispečera.

Rasprava

Cilj je bio istražiti kvalitetu sna medicinskih dispečera koji obavljaju smjenski rad. U skladu s ranijim istraživanjima, rezultati pokazuju da više od polovice ispitanika subjektivno ocjenjuje svoju kvalitetu sna kao lošu. Prevalenciju lošije kvalitete sna istražili su i drugi autori [26, 27, 28, 29, 30, 31], a pojedini su otkrili da je kvaliteta sna bolja kod zdravstvenih radnika koji rade u fiksnim smjenama [32].

Od svih podljestvica, najviše je bila ocijenjena dnevna disfunkcija, što je u skladu s ranijim istraživanjima koja pokazuju da osobe koje rade u smjenama češće doživljavaju smetnje u svakodnevnim aktivnostima u usporedbi s onima koji rade u standardnom radnom vremenu [35]. Brojni su pojedinci koji se žale na nesanicu [36], pospanost i umor [37], a sam rad u noćnim smjenama povećava razinu nesanice [38]. Isto tako, gotovo polovica ispitanih medicinskih sestara žali se na dnevne funkcionalne smetnje [39].

Statistički nisu utvrđene značajne povezanosti kvalitete sna s demografskim varijablama (dob, spol, radni staž). To je u suprotnosti s nekim studijama koje ukazuju na čestu povezanost dobi i spola s poremećajima sna [44], i povezanost starosti i radnog iskustva na kvalitetu sna [45], ali je u skladu s drugim istraživanjima provedenima među populacijom koja obavlja visokostresne poslove, gdje individualne razlike imaju manji utjecaj od radnog konteksta [46].

Tvrdnja *Nakon spavanja, moje misli su sabrane*, kao najviše ocijenjena, ukazuje na to da ispitanici subjektivno doživljavaju mentalnu bistrinu nakon buđenja. Međutim, sustavni pregled pokazuje da noćni rad može imati neposredne negativne učinke na kognitivna područja povezane s pažnjom, pamćenjem i inhibicijom odgovora. Stoga desinkronizacija cirkadijalnog ritma, nedostatak sna i umor koji potječu od noćnog radnog vremena imaju negativan učinak na kognitivnu učinkovitost radnika [33]. Ova diskrepancija može se objasniti profesionalnim zahtjevima medicinskih dispečera, čija je pribranost ključna za donošenje odluka u

Daytime dysfunction was rated the highest of all the subscales, consistent with previous research showing that shift workers experience more disruptions in their daily activities than those who work standard hours [35]. Many individuals complain of insomnia [36], drowsiness and fatigue [37], and night shift work itself increases the level of insomnia [38]. Likewise, almost half of the surveyed nurses reported daytime functional disruptions [39].

No statistically significant differences were found between sleep quality and demographic variables such as age, gender, and years of service. This finding contrasts with some studies indicating a frequent association between age and gender with sleep disorders [44], and between age and work experience with sleep quality [45]. Still, it is consistent with other studies conducted in populations engaged in high-stress professions, where individual differences have less impact than the work context [46].

The statement *I have a clear head after sleep*, which received the highest rating, indicates that respondents subjectively experience mental clarity upon awakening. However, a systematic review shows that night work can immediately negatively affect cognitive domains related to attention, memory, and response inhibition. Therefore, circadian rhythm desynchronization, sleep deprivation, and fatigue originating from night-time work negatively impact workers' cognitive performance [33]. This discrepancy may be attributed to the professional demands placed on medical dispatchers. Their alertness is crucial for decision-making in stressful situations, which may prompt compensatory strategies or subjective overestimation of cognitive performance.

Conversely, the lowest-rated statement was *Poor sleep makes me lose my appetite*, suggesting that poor sleep does not significantly affect appetite. However, research shows that short sleep duration and poor sleep quality are more often associated with increased food cravings and calorie intake, contributing to weight gain [34].

The SQS questionnaire demonstrated high internal consistency in evaluating sleep quality; however, there are some limitations to consider. The sample size was small because there were only a limited number of employees in the medical dispatch service, and not all individuals responded to the questionnaire. This means that our conclusions cannot be generalized to the wider population. Another limitation was the lack of literature on the SQS questionnaire and sleep quality in medical dispatchers.

In the future, conducting further research on the sleep quality of medical dispatchers worldwide would be beneficial. After all, sleep is crucial for everyone, especially for individuals who work shifts or in continuous 24-hour services. Additionally, it would be useful to investigate the effect of different triage models on stress levels and sleep quality. These models vary in their level of standardization and discretionary decision-making, and the investigation should include the use of objective stress biomarkers. That would provide a clearer picture of the global and local factors influencing dispatchers' health and support the development of more effective preservation strategies.

stresnim situacijama, što može potaknuti kompenzacijske strategije ili subjektivno precjenjivanje kognitivne učinkovitosti.

S druge strane, najniže je ocijenjena tvrdnja *Zbog lošeg sna gubim apetit*, što sugerira da loš san ne utječe značajno na apetit ispitanika. Međutim, istraživanja pokazuju da su kratko trajanje sna i loša kvaliteta sna češće povezani s pojačanom žudnjom za hranom i povećanim unosom kalorija, što može pridonijeti debljanju [34].

SQS-upitnik pokazao je visok, to jest, dobar stupanj unutarnje konzistencije u procjeni kvalitete spavanja, ali postoje i ograničenja. Uzorak je bio mali, a razlog tomu mali je broj zaposlenih u medicinskoj dispečerskoj službi, ali i nepotpun broj odgovora na popunjavanje anketnog upitnika, što znači da svoje zaključke ne možemo generalizirati na širu populaciju. Dodatno ograničenje bila je činjenica da nema mnogo literature u području istraživanja koja sadržavaju SQS-upitnik ili kvalitetu sna medicinskih dispečera. U budućnosti bi bilo korisno provesti više istraživanja o kvaliteti sna medicinskih dispečera u različitim dijelovima svijeta jer je san vrlo važan dio života svakog pojedinca, a posebno za one koji obavljaju smjenski rad ili su zaposleni u sustavima koji funkcioniraju kontinuirano, 24 sata dnevno. Dodatno bi bilo korisno istražiti kako različiti trijažni modeli, koji se razlikuju u razini standardizacije i diskrecijskog odlučivanja, utječu na razinu stresa i kvalitetu sna, uz uključivanje objektivnih biomarkera stresa. Time bi se omogućilo bolje razumijevanje globalnih i lokalnih utjecaja na zdravlje dispečera te razvile učinkovitije strategije za njegovo očuvanje.

Praktične implikacije ovog istraživanja odnose se na potrebu za uvođenjem ciljanih mjera za prevenciju poremećaja sna kod medicinskih dispečera, uključujući edukaciju o higijeni sna, optimizaciju rasporeda smjena i moguće uvođenje kraćih rotacijskih ciklusa. Također, preporučuje se sustavno praćenje kvalitete sna kao dijela redovitih evaluacija zaposlenika u dispečerskim službama.

Zaključak

Dobiveni rezultati upućuju na to da više od polovice medicinskih dispečera percipira kvalitetu svojeg sna kao lošu, pri čemu najveći izazov predstavlja dnevna disfunkcija. Iako nisu utvrđene statistički značajne povezanosti između kvalitete sna i demografskih varijabli, rezultati sugeriraju potrebu za dubljim razumijevanjem profesionalnih opterećenja i njihovih posljedica. Specifičnosti dispečerskog rada – uključujući visoke kognitivne zahtjeve, smjenski rad i razlike u trijažnim sustavima – zahtijevaju ciljane intervencije usmjerene na očuvanje zdravlja, funkcionalnost i sigurnost ove ključne skupine zdravstvenih djelatnika.

Nema sukoba interesa.

These practical implications relate to the need to introduce targeted measures to prevent sleep disorders among medical dispatchers, including education on sleep hygiene, optimizing shift schedules, and introducing shorter rotation cycles. It is also recommended that sleep quality be systematically monitored as part of regular employee evaluations in dispatch services.

Conclusion

The results indicate that over half of medical dispatchers perceive their sleep quality as poor, with daytime dysfunction presenting the main challenge. While no statistically significant differences were found between sleep quality and demographic variables, the results highlight the need for a deeper understanding of professional workloads and their consequences. The specificities of dispatching work, including high cognitive demands, shift work, and varying triage systems, require targeted interventions to preserve the health, functionality, and safety of this essential group of healthcare professionals.

Authors declare no conflict of interest.

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