

MEDICAL SCIENCE

To Cite:

Bahmaid AAA, Alotaibi KAM, Aljasser OAJ, Alharthi AM, Almohaimeed AYB, Al-Mansour MAA, Alhegail ROA, Alotaibi FH, Almuhanha MAM. The impact of alternate shifts on emergency doctors' work satisfaction and quality of life in Riyadh region. *Medical Science* 2023; 27: e220ms2990.

doi: <https://doi.org/10.54905/disssi/v27i135/e220ms2990>

Authors' Affiliation:

¹Department of Emergency Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

²Medical Student, College of Medicine, Majmaah University, Majmaah, Saudi Arabia

³Medical Student, King Abdulaziz University, Jeddah, Saudi Arabia

⁴Medical Student, College of Medicine, Northern Border University, Arar, Saudi Arabia

⁵General Practitioner, Department of Emergency Medicine, King Abdulaziz Specialist Hospital, Taif, Saudi Arabia

⁶General Practitioner, Department of Emergency Medicine, Ad Diriyah hospital, Riyadh, Saudi Arabia

*Corresponding author

Department of Emergency Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh,

Saudi Arabia

ORCID: 0009-0009-4568-4788

ORCID List

Abdullah AA Bahmaid	0009-0009-4568-4788
Khalid AM Alotaibi	0009-0003-1758-820X
Omar AJ Aljasser	0009-0009-4666-7533
Abdulrahman M Alharthi	0009-0003-4564-6788
Ashjan YB Almohaimeed	0009-0002-4149-7378
Muath AA Al-Mansour	0009-0003-8215-4985
Renad OA Alhegail	0009-0006-1967-6176
Feras H Alotaibi	0009-0009-9267-2667
Mohammed AM Almuhanha	0009-0004-4926-9876

Peer-Review History

Received: 02 April 2023

Reviewed & Revised: 06/April/2023 to 05/May/2023

Accepted: 09 May 2023

Published: 12 May 2023

Peer-review Method

External peer-review was done through double-blind method.

Medical Science

pISSN 2321-7359; eISSN 2321-7367

This open access article is distributed under [Creative Commons Attribution License 4.0 \(CC BY\)](https://creativecommons.org/licenses/by/4.0/).

The impact of alternate shifts on emergency doctors' work satisfaction and quality of life in Riyadh region

Abdullah AA Bahmaid^{1*}, Khalid AM Alotaibi², Omar AJ Aljasser², Abdulrahman M Alharthi³, Ashjan YB Almohaimeed⁴, Muath AA Al-Mansour², Renad OA Alhegail², Feras H Alotaibi⁵, Mohammed AM Almuhanha⁶

ABSTRACT

Objective: Emergency departments (EDs) in Saudi Arabia have experienced a tremendous increase in patient flow, resulting in increased workloads and decreased satisfaction among emergency physicians (EPs). We aimed to analyze the impact of alternate shifts on Saudi emergency doctors, determine the rate of life satisfaction of those affected and assess the effect of alternating shifts on the quality of their life. **Methods:** This study explored the impact of the alternate shift system on the work satisfaction and quality of Saudi emergency doctors. This study was carried out among 162 emergency physicians employed in emergency departments in different hospitals in Riyadh region, Saudi Arabia. The survey was distributed online and included questions about demographics, satisfaction with job and quality of care and experience with alternate shifts and the results were analyzed using frequency analysis. **Results:** The results showed that the majority of emergency doctors reported a high level of job satisfaction and quality of care. Additionally, 63% of respondents agreed that alternating shifts ever forced them to consider leaving EM as well as 57% of the respondents agreed that alternating shifts had adversely affected their family and social life. **Conclusions:** Alternate shift changes have a moderate to significantly unfavorable effect on EM doctors' social, familial and physical well-being, according to the current study. However, as seen by their high level of career satisfaction, this did not make the doctors consider leaving EM.

Keywords: Alternate shifts, Saudi Arabia, Saudi emergency doctors, work satisfaction, quality of service

1. INTRODUCTION

Saudi Arabia is a rapidly changing and growing country, with a population

of over 30 million people and many medical professionals. In recent years, the Saudi government has implemented an alternate shift system for its emergency doctors to improve patient care and efficiency (Abolfotouh et al., 2017; Baker and Alshehri, 2020). The Saudi emergency health system is one of the most effective and efficient in the world (Banakhar, 2017). To ensure that the system can continue to operate efficiently and effectively, emergency doctors must work long hours in order to provide quality care to patients. However, long working hours can negatively affect the work satisfaction of emergency doctors, which can lead to increased stress and decreased productivity (Albishri and Zamzami, 2021; Shbeer and Ageel, 2022). To mitigate this, many Saudi Emergency Departments have implemented alternative shift patterns, such as extended-hour shifts, staggered shifts and rotating shifts. This shift system seriously impacted the satisfaction of emergency doctors, as they are required to work longer and harder in order to meet the demands of their new shift schedule (Almulhim et al., 2015; Qanash et al., 2021).

The impact of alternate shifts on the work satisfaction of Saudi emergency doctors is a topic of great interest in the medical profession. This has a substantial effect on the work satisfaction of emergency physicians. Ewain and Khan, (2019) investigated emergency physicians' quality of life and job satisfaction after rotating shifts (EP). Multi-centre, cross-sectional, observational study in emergency departments of Saudi hospitals noted that the majority (39.7%) of EP physicians acknowledge that shift changes had an impact on their job satisfaction. Even though 52.6% of the doctors said they had not considered leaving emergency medicine because of shift changes, 15% of them had thought of changing the department (Ewain and Khan, 2019). A systematic questionnaire was employed in a 2017 e-survey of 234 board-certified EP, which determined the extent and causes of burnout among emergency department doctors and nurses in Abha and Khamis Mushait cities.

The majority of emergency medical personnel (88.7%) reported experiencing severe emotional exhaustion. Among emergency medical personnel, high depersonalization (cynicism) was prevalent (20.6%), while low personal accomplishment was prevalent (41.1%) (Boivin et al., 2022). According to the existing literature, all of the research is primarily concerned with the causes and job satisfaction of emergency physicians (Alqahtani et al., 2019; Boivin et al., 2022). This current research has been carried out to examine the impact of alternate shifts on Saudi emergency physicians, as well as to estimate the levels of life satisfaction.

2. MATERIALS AND METHODS

This study obtained approval from the Ethics Committee of Majmaah University (Ethics Number MUREC-Aug.21/COM-2022/11-4). This descriptive cross-sectional study was carried out from 21/8/2022 to 17/11/2022 among physicians working in the emergency departments of various hospitals in Riyadh region, Saudi Arabia. A web-based questionnaire, which was distributed through social media and self-administered by approximately 162 participants' physicians working in an emergency department, was used to collect the data relating to the impact that alternating shifts have on Saudi emergency doctors' work satisfaction and quality of life. The questionnaire includes 18 questions, including demographic inquiries and consent. All emergency departments' physicians working on alternate shifts in different hospitals of Riyadh region were enrolled in this study. Interns, emergency physicians working on fixed schedules and physicians who did not give consent for participation were excluded.

Statistical analysis

We analyzed the research data using the SPSS software, version 26 (IBM Corp., Armonk, NY, USA). Categorical variables were summarized as frequencies (%). We tested the normality of continuous variables by the Shapiro-Wilk test. They were not normally distributed and presented as the median and interquartile range (25th -75th percentiles). The associations between socio-demographic and work variables and the participant's satisfaction were tested using χ^2 tests (Pearson's Chi-square for independence or Fisher Exact Tests as appropriate) and the Mann-Whitney U test. Furthermore, all variables that showed a p-value of 0.1 or less in the univariate analysis were analyzed with a multivariable logistic regression to determine the significant risk factors associated with low satisfaction. A p-value of < 0.05 was adopted to indicate statistical significance.

Ethical considerations

Participation in the research was completely voluntary, participants' agreement was obtained at the start of the questionnaire and they were able to leave the study at any moment. The participants' identities will not be connected to any of the information they supply. Ethical approval was obtained by The Majmaah University for Research Ethics committee.

3. RESULTS

This study recruited a total of 162 EM physicians. Males outnumbered females (69.1% and 30.9%, respectively). Their mean age was 31.8 ± 6.3 years, with more than half (51.9%) in the age group of 22-30 years. Married physicians constituted 42.0% and 29.6% were

having children. Most of the participants (82.1%) had 0–10 years of experience. The median number of monthly clinical shifts at their primary hospitals was 16.0 (IQR: 15.0-18.0) and 40.1% had nonclinical hours. The participating physicians were belonging to various hospitals; 35 (21.6%) respondents were working in terminal hospitals while those from King Saud University Medical City (MoE) and Diriyah hospitals represented 16.0% and 15.4%, respectively (Table 1).

Table 1 Socio-demographics and characteristics of the participants (N=162)

		N=162	%
Gender	Female	50	30.9%
	Male	112	69.1%
Age, years	Mean± SD	31.8± 6.3	
Age groups	22-30	84	51.9%
	31-40	64	39.5%
	41-60	14	8.6%
Marital status	Single	94	58.0%
	Married	68	42.0%
Have children	No	114	70.4%
	Yes	48	29.6%
Primary working hospital	Terminal hospitals	35	21.6%
	King/Saud University Medical City (MoE)	26	16.0%
	Diriyah Hospital	25	15.4%
	Prince/Mohammed Bin Abdulaziz Hospital	12	7.4%
	King/Abdullah University Hospital (Prince Nourah University)	10	6.2%
	KingFahad Medical City	9	5.6%
	King/Saud Medical City (MoH)	8	4.9%
	Dallah Hospital	8	4.9%
	Prince/Sultan Military Medical City	7	4.3%
	Dr/Sulaiman Al Habib Medical Group	7	4.3%
	King/Salman bin Abdulaziz Hospital	6	3.7%
	Al Iman General Hospital	5	3.1%
	Mouwasat Hospital	3	1.9%
	King/Khalid Hospital in Majmaah	1	0.6%
Years in the practice of EM	0-10	133	82.1%
	11-20	24	14.8%
	21-30	5	3.1%
Clinical shifts/month at the primary hospital	Median (IQR)	16.0 (15.0-18.0)	
Clinical shifts/month as part-time in another hospital	Median (IQR)	0.0 (0.0-0.0)	
The number of non-clinical hours per week	Median (IQR)	0.0 (0.0-4.0)	
Having non-clinical hours		65	40.1%

N: Number, SD: Standard deviation, IQR: Interquartile range, EM: Emergency Medicine

Table 2 shows the career satisfaction and quality of life of the studied EM physicians. About one-third (32.1%) reported equal distribution of their shifts between night, evening and morning, while 29.6% had night shifts more frequently. Most of the participants (49.3%) were satisfied/very satisfied regarding EM career while 17.9% were either dissatisfied or very dissatisfied. About one-third (31.2%) of the physicians reported that alternation of shifts had a negative influence on their job satisfaction.

Thirty-seven percent of the participants documented that shift alternation forced them to consider leaving EM while a higher percentage (63%) of them denied this. Only 15.4% of the participants admitted that shift alternation was a major factor in deciding to leave EM. Remarkably, in 59.3% of the EM physicians, shift alternations showed a moderate-to-major adverse effect on their life (family and social). Moreover, 94.4% believed that alternation of shifts showed a causal or an aggravating effect regarding certain medical conditions such as insomnia (37%), fatigue (35.8%), smoking (11.7%), hypertension (6.2%) and others (3.6%).

Table 2 Career satisfaction and quality of life of the studied emergency medicine physicians (N=162)

		N=162	%
Satisfaction with EM career	Very Dissatisfied	8	4.9%
	Dissatisfied	21	13.0%
	Neutral	53	32.7%
	Satisfied	49	30.2%
	Very satisfied	31	19.1%
Negatively influence of alternating shifts on job satisfaction	Not at all	21	13.0%
	Slightly	38	23.5%
	Somewhat	52	32.1%
	Very	37	22.8%
	Extremely	14	8.6%
Distribution of the most frequent shifts	Equal distribution	52	32.1%
	Evening shifts	36	22.2%
	Morning shifts	26	16.0%
	Night shifts	48	29.6%
Effect of alternating shifts on considering leaving the EM	No	102	63.0%
	Yes	60	37.0%
The degree of effect of alternating shifts on the decision to leave EM	Not a factor	56	34.6%
	Minor	40	24.7%
	Moderate	41	25.3%
	Major	25	15.4%
The negative impact of alternating shifts on the social life and family time	Not a factor	18	11.1%
	Minor	48	29.6%
	Moderate	57	35.2%
	Major	39	24.1%
Health problem primarily caused or aggravated by shift alternation	Insomnia	60	37.0%
	Fatigue	58	35.8%
	Smoking	19	11.7%
	Hypertension	10	6.2%
	No	9	5.6%
	Obesity	2	1.2%
	Anxiety	2	1.2%
	Irritable bowel disease	1	0.6%
	All of above	1	0.6%
The degree of considering shift alternation as the primary cause	Not a factor	19	11.7%
	Minor	48	29.6%
	Moderate	58	35.8%
	Major	37	22.8%

N: Number, EM: Emergency Medicine

Table 3 and Figures 1, 2, 3, 4 and 5 show that the low satisfaction of the study subjects was significantly associated with their age, marital status, having children and years in practice (All p values <0.05). The median age of the physicians who reported low satisfaction (31.0, IQR: 28.0-39.0) was significantly slightly higher than their counterparts (30.0, IQR: 27.0-34.0). A significantly high percentage of physicians with low satisfaction were married (58.6%) and having children (51.7%). Moreover, most of the participants with low satisfaction (65.5%) were having a low number of years in practice (0-10 years).

Table 3 Factors associated with low satisfaction with emergency medicine career (N=162)

		Low Satisfaction		P-Value
		No (N=133) ^a	Yes (N= 29) ^b	
Age, years	Median (IQR)	30.0 (27.0-34.0)	31.0 (28.0-39.0)	0.037*
Clinical shifts/month at the primary hospital	Median (IQR)	16.0 (15.0-18.0)	18.0 (16.0-18.0)	0.149
Clinical shifts/month as part-time in another hospital	Median (IQR)	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.450
Non-clinical hours/week	Median (IQR)	0.0 (0.0-4.0)	0.0 (0.0-4.0)	0.994

^aNo means neutral, satisfied, or very satisfied, Yes means ^bDissatisfied or very dissatisfied, IQR: interquartile range, *: Significant at p<0.05

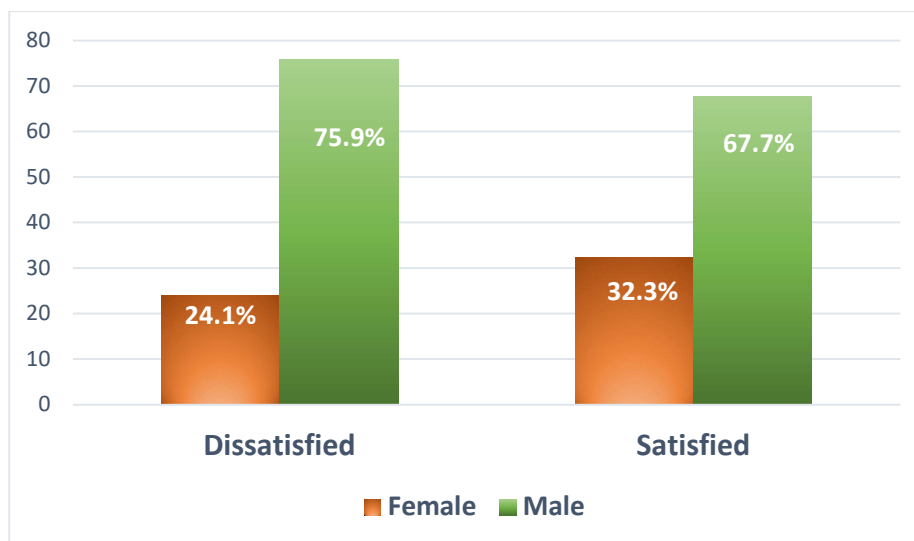


Figure 1 Association between gender and satisfaction (P=0.387)

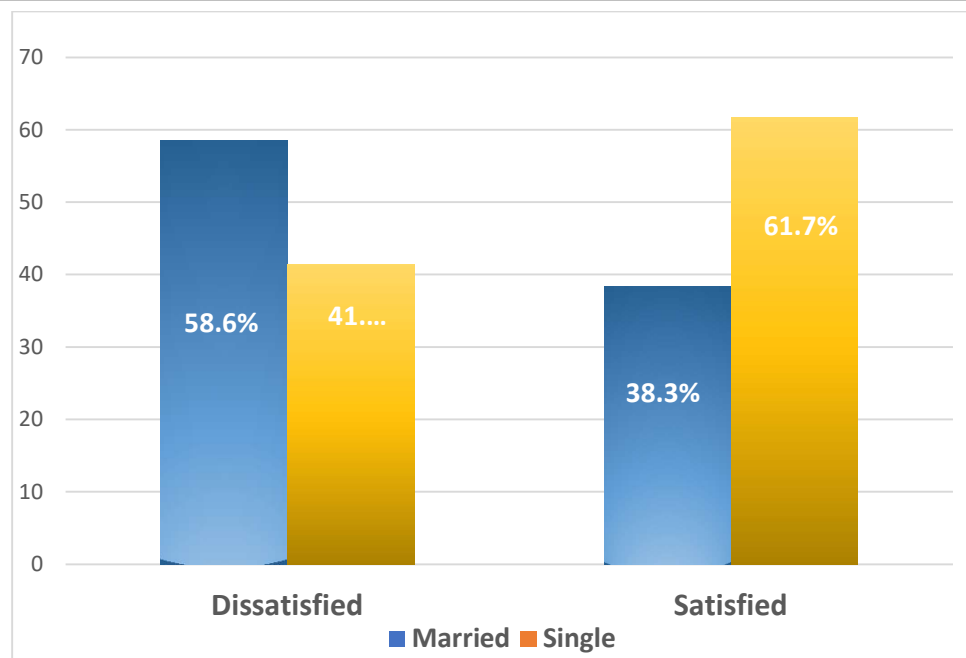


Figure 2 Association between marital status and satisfaction (P=0.045)

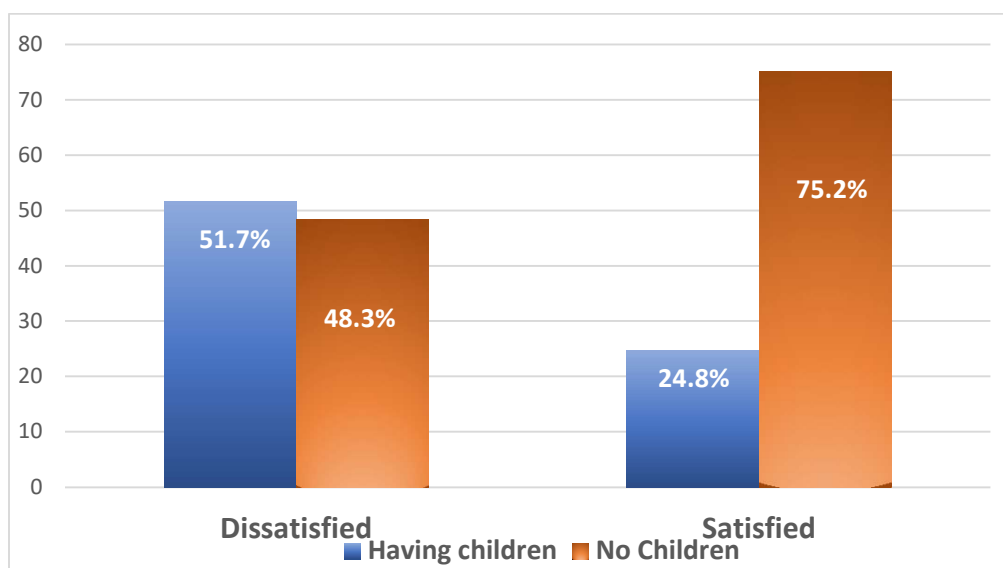


Figure 3 Association between having children and satisfaction (P=0.004)

Multivariable regression analysis revealed that participants having children were significantly associated with 3.247 times increased likelihood of low satisfaction (AOR: 3.247, CI: 1.419-7.430, p-value=0.006) (Table 4).

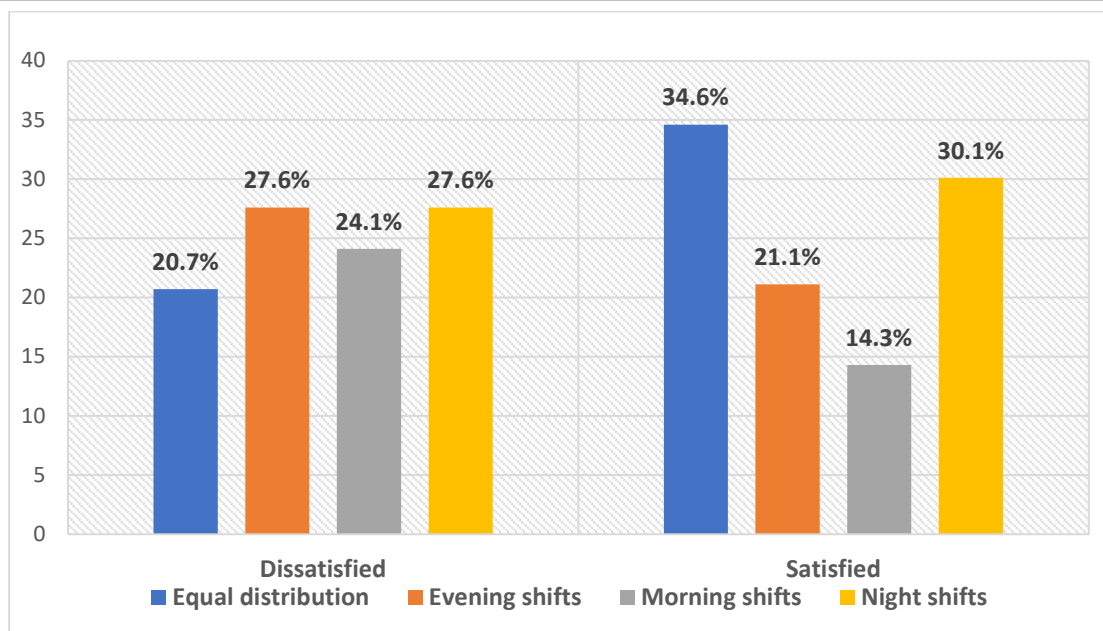


Figure 4 Association between distribution of the most frequent shifts and satisfaction ($P=0.337$)

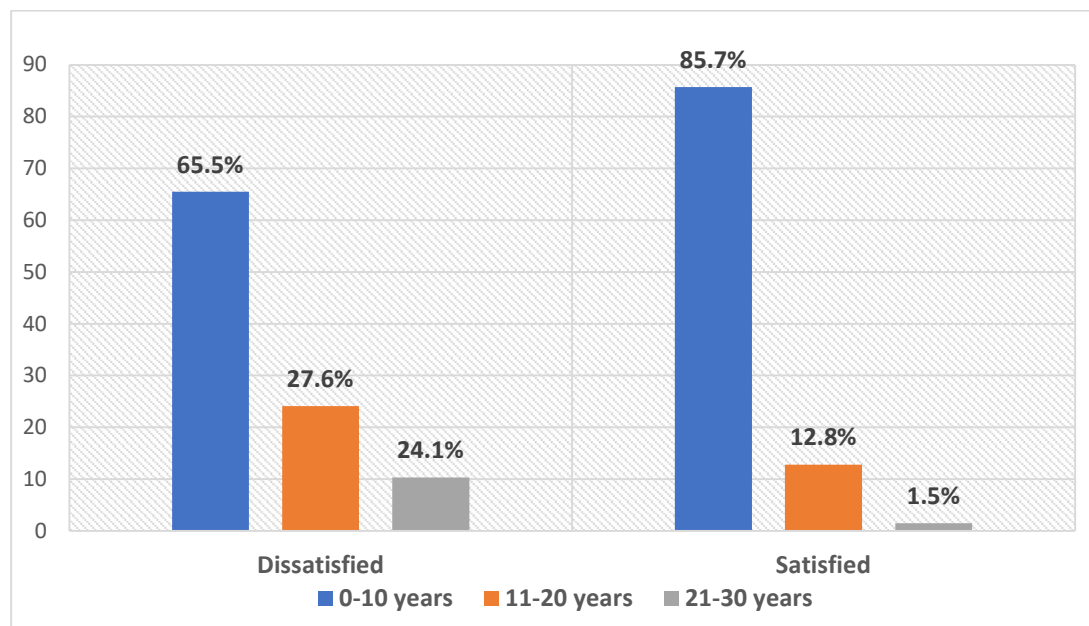


Figure 5 Association between years in practice and satisfaction ($P=0.013$)

Table 4 Multivariable backward stepwise logistic regression analysis regarding factors associated with low satisfaction with emergency medicine career

	B coefficient	P-value	AOR	95% CI		Accuracy	P-Value
				Lower	Upper		
Having children	1.178	0.005*	3.247	1.419	7.430	82.1%	0.006*
Constant	-1.966	<0.001*	0.140				

AOR: Adjusted odds ratio, CI: Confidence interval, *: Significant at $p<0.05$

4. DISCUSSION

Shift work is a fundamental element of the emergency medicine practice as it is a guarantee for the continuity of care in the emergency department. However, it is associated with sleep alterations and disruption of circadian rhythms, which may impact the physical and psychological well-being of EM physicians (Ferri et al., 2016). Furthermore, career satisfaction substantially contributes

to professional longevity, physician well-being and work performance (Welp et al., 2014). The current study assessed the perceptions of physicians of emergency medicine working in Riyadh region hospitals, in Saudi Arabia about how alternating shifts can influence their career satisfaction and quality of life.

Concerning work satisfaction, most of the participating physicians (49.3%) in this study were satisfied/very satisfied regarding EM career, while only 17.9% were either dissatisfied or very dissatisfied. About one-third (31.2%) of the physicians thought that alternation of shifts adversely affected their job satisfaction. Though 37% of the participants stated that shift alternation enforced them to consider leaving EM, a higher percentage (63%) of them denied this. Furthermore, a high percentage (59.3%) of the EM physicians reported a moderate-to-major adverse influence of shift alternations on their social life and a much higher percentage (94.4%) believed that shift alternations primarily caused or aggravated one or more health problems. The most commonly reported health problems were insomnia (37%), fatigue (35.8%), smoking (11.7%), hypertension (6.2%) and others (3.6%). We also elucidated that older age, marriage, having children and fewer years of experience significantly contributed to dissatisfaction with the EM career, with 3.247 times increased likelihood of low satisfaction among participants having children.

These findings coincide with a previous study in Saudi Arabia that included 234 board-certified EM physicians working in various public and private hospitals. The study revealed a higher frequency of (59.4%) of satisfaction with EM career than dissatisfaction. As well, the negative impact of shift alternation on career satisfaction was reported by 37% of the participants and most of them (52.6%) denied that shift alternation provoked them to leave EM. Moreover, in 88.1% we found a belief regarding that shift alternation was a predominant causal or aggravating factor of one or more health problems (Ewain and Khan, 2019). A recent Saudi study investigated the opinions of emergency department workers including nurses, residents and attending physicians about night shifts. The physicians were satisfied with working night shifts but they agreed with increased risk of drug/alcohol misuse and incidence of depression in relation to night shifts (Alaska et al., 2022).

In a study in the United States most of the participating emergency physicians (58%) thought that night shift work had a moderate to major adverse influence on their job satisfaction and it can enforce them consider stop working. Moreover, most participants reported that night shifts negatively impacted their health, with fatigue (36%) and poor sleep quality (35%) being the most frequent (Smith-Coggins et al., 2014). The American Board of EM surveyed 863 EM physicians and documented a high proportion of overall satisfaction with emergency medicine, with a significantly higher frequency of low satisfaction among younger than older physicians and among females than males (Lall et al., 2021).

In this study, most participants believed that shift alternation can cause or aggravate certain medical problems including insomnia, fatigue, smoking and hypertension. This finding agrees with earlier studies showing the detrimental health effects of shift work (Lloyd et al., 1994; Arora et al., 2013; Smith-Coggins et al., 2014; Agha et al., 2015). Moreover, a recent longitudinal cohort study of the United States female nurses concluded that working in rotating night shift had a considerable health impact and was correlated with decreased likelihood of healthy aging (Shi et al., 2022). In this context, shift patterns and irregular work have been reported as major stress factors that cause exhaustion and fatigue and are associated with higher rates of chronic comorbidities (Ağrı et al., 2020).

The current survey explored the negative views of the EM physicians about the effect of shift alternations on their social life. About 59% of the participants reported a moderate-to-major bad influence of shift alternations on social life. Most EM staff counterattack sleeping during the day to share their familial or social life which might cause negative attitudes during their familial and social contact (Schmitz et al., 2012). As well, EM physicians think that they cannot spare enough time for themselves, their families, their social life and hobbies because they are confronted with irregularity of working hours, fatigue and exhaustion following night shifts, insufficient control over the working hours and the flexibility of the schedule (Brown et al., 2010). Therefore, strategies to minimize the negative impact of alternating shifts such as rotating shifts after 2-week periods and an average of 2 days off per week have been suggested (Wu et al., 2018).

Elucidating the physician satisfaction-related factors may help the development of targeted interventions to improve the professional well-being of emergency medical workers (Schneider et al., 2019). In this study, some factors were significantly associated with low satisfaction which includes older age, marriage, having children and fewer years of experience. This result is in line with previous studies in Turkey and Greece which revealed that residents who spent more than 10 years in the EM profession showed lower burnout scores and higher job satisfaction in comparison with the beginners (Toker et al., 2015; Boutou et al., 2019). It has been established that organizational and system factors contribute more to the physician's well-being than on personal factors (Melnyk, 2019). Though, our study revealed significant contributions of personal factors to emergency medicine career satisfaction. Challenges from familial responsibilities of marriage and children showed increased odds of low satisfaction.

The cross-sectional survey-based studies carry some limitations which were considered during the interpretation of the results. All measures were based on self-reporting which likely produced recall/report bias and we couldn't establish a causal relationship between the studied variables and the participant's satisfaction. The studied participants were a convenience sample rather than a random one. Nevertheless, the participants represented a variety of hospitals and the Riyadh region of Saudi Arabia.

5. CONCLUSIONS

The findings of the present study indicate that most emergency physicians working in Riyadh region hospitals, in Saudi Arabia were satisfied or very satisfied with their career in emergency medicine. There were considerable negative perceptions about the influence of shift alternation on their satisfaction, social life and physical well-being. Though, most of them denied that working in alternating shifts provoked them to leave emergency medicine. Some personal factors such as marriage and having children, in addition to low experience significantly contributed to low career satisfaction.

Author Contributions

All authors shared in the study conception as well as the study design. Material preparation, data collection and analysis were carried out by Feras H Alotaibi, Khalid AM Alotaibi, Omar AJ Aljasser and Abdulrahman M Alharthi. The first draft of the manuscript was prepared by Ashjan YB Almohaimeed, Muath AA Al-Mansour and Renad OA Alhegail. The manuscript was revised by Abdullah AA Bahmaid and Mohammed AM Almuhanha. All authors have read and approved the final manuscript.

Acknowledgement

We thank the participants who were all contributed samples to the study.

Ethical approval

The study was approved by the Medical Ethics Committee of Majmaah University (Ethical approval code: MUREC-Aug.21/COM-2022/11-4).

Informed consent

Written informed consent was obtained from all individual participants included in the study.

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES AND NOTES

1. Abolfotouh MA, Al-Assiri MH, Alshahrani RT, Almutairi ZM, Hijazi RA, Alaskar AS. Predictors of patient satisfaction in an emergency care centre in central Saudi Arabia: A prospective study. *Emerg Med J* 2017; 34:27-33. doi: 10.1136/emered-2015-204954
2. Agha A, Mordy A, Anwar E, Saleh N, Rashid I, Saeed M. Burnout among middle-grade doctors of tertiary care hospital in Saudi Arabia. *Work* 2015; 51:839-47. doi: 10.3233/wor-141898
3. Ağı İ, Sönmez BM, İşcanlı MD, Ülgen SEJA. Effects of the Schedule and Duration of the Posts for Emergency Medicine Residents on Their Social Life and Practice. *Eurasian J Emerg Med* 2020; 19:203-9.
4. Alaska YA, Al-Yahya B, Al-Fakhri L, Al-Harbi B, Alkattan F, Alhayaza RM. Emergency Medicine Personnel's Preparation, Performance and Perception of Their Night Shifts: A Cross-Sectional Study from Saudi Arabia. *Adv Med Educ Pract* 2022; 13:167-75. doi: 10.2147/amep.S339063
5. Albishri F, Zamzami L. Perception of Effects of Shiftwork Questionnaire (PESQ) among Ambulance Service Staff in Saudi Arabia: An Exploratory Factor Analysis. *Open J Emerg Med* 2021; 9:123-34. doi: 10.4236/ojem.2021.93012

6. Almulhim DA, Saddik B, Arabia S. Factors Influencing Patient Waiting Time as Key Performance Indicator of the Emergency Department Services at National Guard Health Affairs-Dammam Hospital. *Public Health Front* 2015; 4(2):7-17.
7. Alqahtani AM, Awadalla NJ, Alsaleem SA, Alsamghan AS, Alsaleem MA. Burnout Syndrome among Emergency Physicians and Nurses in Abha and Khamis Mushait Cities, Aseer Region, Southwestern Saudi Arabia. *Sci World J* 2019; 2019:4515972. doi: 10.1155/2019/4515972
8. Arora M, Asha S, Chinnappa J, Diwan AD. Review article: Burnout in emergency medicine physicians. *Emerg Med Australas* 2013; 25:491-5. doi: 10.1111/1742-6723.12135
9. Baker O, Alshehri B. The Relationship between Job Stress and Job Satisfaction among Saudi Nurses: A Cross-Sectional Study. *Nurse Media J Nurs* 2020; 10:292-305. doi: 10.14710/nmjn.v10i3.32767
10. Banakhar M. The impact of 12-hour shifts on nurses' health, wellbeing and job satisfaction: A systematic review. *J Nurs Educ Pract* 2017; 7:69. doi: 10.5430/jnep.v7n11p69
11. Boivin DB, Boudreau P, Kosmadopoulos A. Disturbance of the Circadian System in Shift Work and Its Health Impact. *J Biol Rhythms* 2022; 37:3-28. doi: 10.1177/07487304211064218
12. Boutou A, Pitsiou G, Sourla E, Kioumis I. Burnout syndrome among emergency medicine physicians: An update on its prevalence and risk factors. *Eur Rev Med Pharmacol Sci* 2019; 23:9058-65. doi: 10.26355/eurrev_201910_19308
13. Brown M, Tucker P, Rapport F, Hutchings H, Dahlgren A, Davies G, Ebden P. The impact of shift patterns on junior doctors' perceptions of fatigue, training, work/life balance and the role of social support. *Qual Saf Health Care* 2010; 19: e36. doi: 10.1136/qshc.2008.030734
14. Ewain NS, Khan AA. The effect of alternating shifts on the quality of life and career satisfaction of emergency physicians in Saudi Arabia: A survey study. *J Nat Sci Med* 2019; 2:153-63.
15. Ferri P, Guadi M, Marcheselli L, Balduzzi S, Magnani D, Di-Lorenzo R. The impact of shift work on the psychological and physical health of nurses in a general hospital: A comparison between rotating night shifts and day shifts. *Risk Manag Healthc Policy* 2016; 9:203-11. doi: 10.2147/rmh.p.S115326
16. Lall MD, Chang BP, Park J, Tabatabai RR, Manfredi RA, Baren JM, Castillo J. Are emergency physicians satisfied? An analysis of operational/organization factors. *J Am Coll Emerg Physicians Open* 2021; 2:e12546. doi: 10.1002/emp2.12546
17. Lloyd S, Streiner D, Shannon S. Burnout, depression, life and job satisfaction among Canadian emergency physicians. *J Emerg Med* 1994; 12:559-65. doi: 10.1016/0736-4679(94)90360-3
18. Melnyk BM. National Academy of Medicine's Action Collaborative on Clinician Well-being and Resilience: A solution-focused strategy is designed to curtail the burnout epidemic. *Am Nurse Today* 2019; 14:61-4.
19. Qanash S, Alwafi H, Barasheed S, Bashnaini S, Andergiri R, Yaghmour L, Murad W, Shabrawishi M, Naser A, Alsyyid B. Impact of night shifts on sleeping patterns, psychosocial and physical well-being among healthcare professionals: A cross-sectional study in a tertiary hospital in Saudi Arabia. *BMJ Open* 2021; 11:e046036. doi: 10.1136/bmjopen-2020-046036
20. Schmitz GR, Clark M, Heron S, Sanson T, Kuhn G, Bourne C, Guth T, Cordover M, Coomes J. Strategies for coping with stress in emergency medicine: Early education is vital. *J Emerg Trauma Shock* 2012; 5:64-9. doi: 10.4103/0974-2700.93117
21. Schneider A, Wehler M, Weigl M. Effects of work conditions on provider mental well-being and quality of care: A mixed-methods intervention study in the emergency department. *BMC Emerg Med* 2019; 19:1. doi: 10.1186/s12873-018-0218-x
22. Shbeer A, Ageel M. Assessment of Occupational Burnout among Intensive Care Unit Staff in Jazan, Saudi Arabia, Using the Maslach Burnout Inventory. *Crit Care Res Pract* 2022; 2022:1-7. doi: 10.1155/2022/1298887
23. Shi H, Huang T, Schernhammer ES, Sun Q, Wang M. Rotating Night Shift Work and Healthy Aging After 24 Years of Follow-up in the Nurses' Health Study. *JAMA Netw Open* 2022; 5:e2210450-e. doi: 10.1001/jamanetworkopen.2022.10450 %J JAMA Network Open
24. Smith-Coggins R, Broderick KB, Marco CA. Night shifts in emergency medicine: The American board of emergency medicine longitudinal study of emergency physicians. *J Emerg Med* 2014; 47:372-8. doi: 10.1016/j.jemermed.2014.04.020
25. Toker I, Ayrik C, Bozkurt S, Çalışkan F, Basterzi A, Hacı S, Ovla-Çelikcan D. Factors affecting burnout and job satisfaction in Turkish emergency medicine residents. *Emerg Med Open J* 2015; 1:64-71
26. Welp A, Meier LL, Manser T. Emotional exhaustion and workload predict clinician-rated and objective patient safety. *Front Psychol* 2014; 5:1573. doi: 10.3389/fpsyg.2014.01573
27. Wu YF, Wang PC, Chen YC. Gender Differences and Work-Family Conflicts among Emergency Physicians with Intention to Leave. *Emerg Med Int* 2018; 2018:3919147. doi: 10.1155/2018/3919147