Alqalam Journal of Medical and Applied Sciences. 2025;8(1):106-110
https://doi.org/10.54361/ajmas.2581017

Original article

Prevalence and Factors Associated with Burnout among Libyan Radiologists: A Cross Sectional Study

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Abstract
Burn-out syndrome is defined by world health organization as a syndrome resulted from chronic unmanaged work-place stress. It is considered as a raising psychological concern among health-related communities due to its series impacts on quality of health services and worker performance as well as mental health of health workers. Work related burnout happens usually amongst doctors than among those work in other jobs. Globally, researches showed escalating prevalence of burn out among radiologists. There is a lack of research regarding this topic in Libya. Therefore, the aim of this paper is to analyses the prevalence of burn out and possible associated factors among radiologists in Al-Baida Medical Centre (AMC)\Libya. A cross sectional observational study carried out by using a structured survey including 3 main sections; demographic, possible associated factors and Maslach Burnout Inventory Human Services Survey (MBI-HSS). A data from 25 radiologists collected and analyzed with correlation via cross tables (Pearson- Chi-square). The result revealed about 80% of surveyed radiologists experiencing moderate to high level of burn-out syndrome. Correlation was significant between Burnout Emotional exhaustion and administrative task and being a member of teaching staff ($r= 6.92$, $p< .05$) and ($r=5.8$, $p <0.05$). Interestingly 96% stated stress during work is considerably reduced if a second opinion offered by expert colleagues. 76% of surveyed radiologists admitted extended their working hours and 44% of them doing that frequently. Spuriously, almost half of radiologists consider give-up and changing their career. While nearly 70% stated that their work affecting their family life. The result of this paper is consistent with other western countries. However, a further detailed national study is required to further investigate this health-related paradigm and necessitate the action to mitigate the negative impact of this syndrome.
Keywords. Burn Out, Radiologists, Libyan Radiologists, Burn Out, Maslach Score.

Introduction

Burn-out syndrome is a worldwide raising psychological concern among health-related communities. It is defined by world health organization as a syndrome resulted from chronic unmanaged work-place stress [1]. Burn out syndrome has series impacts on health worker performance and the quality of services. The consequences of burnout extend far beyond boundaries of health services into the quality of life of health worker and even endanger the mental health with increasing the risk of substance abuse and suicidal ideation [1-6].

In 1981, Maslach and Jackson categorize the syndrome onto three main categories: Burnout Emotional exhaustion (EE), depersonalization (DP), and a reduced sense of personal accomplishment (PA) [4,5]. The first category, emotional exhaustion (EE) is referred to emotional tension and the inability to fulfill obligations. While the depersonalization (DP), is referred to be a sense of decreased competence, pessimistic and unsympathetic feelings toward other colleagues. The last is a decrease in personal accomplishment (PA) referred to feeling's dissatisfaction by oneself, work, and even life [4,7,8]. In Germany, 76.7% of radiologists exhibit burnout symptoms [5]. A recent systemic review by Nader et al (carried out in 2023) highlights the globally increasing prevalence of burnout among radiologist up to 88% [1]. This raising paradigm might be explained by the nature of radiologists' work in terms of dealing with increasing number of patients, maintaining of high level of accuracy, dealing with emergency cases, long working hours with after work obligations, bound to other academic and administrative works, rapidly evolving knowledge and technology, work isolation and inefficient work flow [1,6,9].

Despite being a topic of considerable interest, burn-out is insufficiently addressed in Libyan and Arab researches. In order to shade light on this important topic, this article addressed the prevalence of burn-out among radiologists of Al- Baida medical Centre (AMC) by using Maslach Burnout Inventory Human Services Survey (MBI-HSS), and the possible associated factors of burn out among the studied group. This paper would help raise the awareness about burn out and can be used as baseline for further related researches in the region.

Methods

This is a cross-sectional observational study, carried on radiology department at Al Baida Medical Centre, Libya. All attending radiologists had received a hard copy form of a survey. The survey was structured into

Received: *27-11-2024* - ***Accepted***: *09-01-2025* - ***Published***: *16-01-2025*

three sections: demographic section, work load and well-being related section (years of experience, employment history, work load, sleep quality and family life, any history of seeking medical advice regarding burn out syndrome). The final section is Maslach Burnout Inventory Human Services Survey (MBI-HSS) that is the qualitative assessment of the degree of professional burnout.
The data collected from July 2024 to September 2024. The data analyzed by using statistical package for social sciences (SPSS 24, IBM Corp), hereby, a p value considered statistically significant at level <0.05. For frequency rate and demographic data, a descriptive analysis was done. For correlation analysis a cross tables via Pearson- Chi-square was used.

Results

The total number of radiologists working in radiology department at Baida medical Centre is 30 radiologists, 25 of them completed the survey with 83% response rate. The mean ages for participants were 35.5 ± 7.3 years. 20% were male and 80% were female. The demographic data summarized in table (1). Intergrading to employment and work situation, 60 % working for 48 hours\ week, and 40 % working for more than 48 hours \week. Residents represent 59% and specialists represent 40%. Years of experience ranged from one year to 40 years. 20% of working radiologists has extra administrative tasks as well as those being members of teaching staff. 64% of participants working in public hospital only, while the rest working in both public and private sectors.

Table 1. The demographic and employment status of studied population.

Demographic data	Percentage
Sex	
Male	20%
Female	80%
Marital status	
Married	76%
Unmarried	24%
Professional status	
Resident	14%
Specialist	82%
consultant	4%
Working hours\week	
< 48 hours	60%
>48 hours	40%
Work place	
Public	64%
Public & private	36%
Teaching staff	
Member	24%
Non member	76%
Administrative tasks	
Yes	20%
No	80%

Work load stated as frequently over-whelming by 36% of radiologists, while 60 % of participants consider work load and stress are manageable, figure (1). Interestingly 96% stated stress during work is considerably reduced if a second opinion offered by expert colleagues. The majority of radiologists (96%) sacrifice their break-time while working (20% daily, 68% weekly, 2% monthly). 76% of surveyed radiologists admitted extended their working hours and 44% of them doing that frequently.

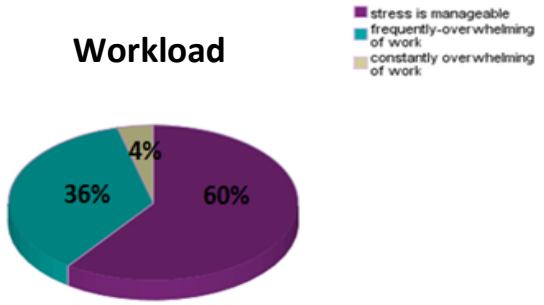

Figure 1. Percentage of how the radiologists estimated their workload.

Received*: 27-11-2024 -* ***Accepted****: 09-01-2025 -* ***Published****: 16-01-2025*

In regard to well-being, the mean sleep quality was moderate (56%). Spuriously; almost half of radiologists consider give-up and changing their career. While nearly 70% stated that their work affecting their family life. Only 4% of participants sought medical advice and received prescribed medications for managing stress. Regarding burn out, about 80% of surveyed radiologists experiencing moderate to high level of burn-out syndrome. Sever and moderate emotional exhaustion seen in 20% and 30% of participants respectively. Depersonalization ranked high among radiologists with almost 70%. Personal accomplishment also showed high score of burnouts among nearly half of surveyed radiologists. Despite this high percentage of burn-out among surveyed radiologists, 76% of them did not know about this syndrome before. Correlation was investigated by Cross table-chi-square test and was significant correlation between Burnout Emotional exhaustion and administrative task and being a member of teaching staff ($r= 6.92$, $p< .05$) and ($r=5.8$, $p <0.05$). While extending working hour, work load, showed no significant correlation.

Discussion

Burnout amongst doctors was expressed first in 1974 as a job-related syndrome [10]. Burnout has three elements; emotional exhaustion which is the most important component, the second element is decrease in personal accomplishment, the last component is depersonalization which is marked in emotionally isolated feeling towards others and oneself [11]. Work related burnout happens usually amongst doctors than among those work in other jobs, it is an unquestionable reality that doctors work needs constant contact with public. Therefore, they are more susceptible to burnout, and radiologists ranked among the highest score of burnout [6,10]. It is observed that the burnout syndrome distress physicians at all stages of their profession from residents to qualified physicians [10]. In latest years, current medicine has been described with significant development, intensive advance in technology and science and raised competition among different participants on health care fields [10]. In addition, mangers demand for expertise, skills, information and administrative behavior of physicians, this continued trend guides to considerable transform in the lives of medical workers in public as a whole [10]. A rise in the expectation of leaders and patients leads to increase stress on doctors in every day [10]. Every medic gives significant time of their lives for the development of their profession and is prone to regular stress from work environments. This occupation related stress is continuingly accumulating unnoticed by the person till is escorted by a number of signs that are evident later on. Despite the alarming consequences of this syndrome, it contracts a little attention in radiology literatures [12]. Our research might shed light on burnout syndrome among radiologists on our center (Al-Baida Medical Center, AMC) and would be used as a foundation for further studies in the area.

The result of our study revealed that the total number of radiologists working in radiology department at Al-Baida medical Centre (AMC) is 30 radiologists. 25 of them completed the survey with 83% response rate. The mean ages for participants were 35.5 ± 7.3The, 20% were male and 80% were female. According to research done by Harolda et, al., the burnout rate among female radiologists was 54% and 47% for male radiologists [11]. Residents experience significantly higher rates of burnout than doctors as a whole. Residents' female doctors are prone to burnout more than male doctors, even though, this is not varied from general population; both female and male doctors are at higher risk of suicide than general population. However, female doctors are at considerably higher threat than their male colleagues [12]. Female doctors might be more susceptible to face clash between their personal goals and professional or between career and family life, they may experience significance physical and career challenges linked to pregnancy [12]. Our study showed no significant difference of burn out in terms to gender.

Regarding Intergrading to employment and work, in this research, 60% of the participants are working for 48 hours/ week, and 40 % of them working for more than 48 hours /week. While working hours is persistently increase, unfavorable effects build up; include decreased work quality due to limited time of unpredicted new work, and exhaustion due to increased rate of duty calls, furthermore, feeling isolated is other factors related to doctor's burnout [13]. In this study, the majority of radiologist (96%) sacrifices their break time while working (20% daily, 68% weekly, and 2% monthly).

Maintaining an enough supply of doctors to meet the medical needs of the public is a mandatory to optimize the quality of health care system. Since understaffing is contributing to job-related stressors, that are linked to burnout [13]. Too much workload is a usual stressor for doctors, that apparent in elevated work intensity, extended working hours and more night call duties, things lead to work dissatisfaction as insufficient skills and training for the job, hard shifts, inequitable supervisor, long hours are considered as risk factors for burnout [4,11,13]. According to Cao et al study in 2023, radiologists experience unpredictably high work load at least once a week while trainee in radiology reported that one to two times per week [13]. In this study, Work load stated as frequently over-whelming by 36% of radiologists, while 60 % of participants consider work load and stress are manageable.

Despite, increasing the demands for medical imaging, there is a shortage of radiologists. The staff shortage negatively impacts the programs of radiology residency which in turn increase vulnerability for burnout among radiologists [13]. In addition to, lack of professional support due to relative shortage of specialists

Received: *27-11-2024* - ***Accepted***: *09-01-2025* - ***Published***: *16-01-2025*

adds another risk for burn out [13]. Fascinatingly, in this study, 96%of radiologists stated stress during work is considerably reduced if a second opinion offered by expert colleagues.

Harolds et al, estimated that burnout rate was highest (58%) amongst those aged between 46 to 55 years old, while those who are aged 66 years or older showed the least burnout rate (30%) [11]. It is well known that residency exposes junior doctors to difficult environmental circumstances that lead to high level of stress; as a consequence, they may be mainly prone to fight anger control and depression [12]. In contrary, this research shows no significance difference of burn out among residents and specialists.

Previous researches on burnout among radiologists from the USA, Canada, Germany and the UK demonstrate a high prevalence and universal nature of burnout, comparing with another medical branches, the prevalence of burnout among radiologists is the fourth highest rate [5]. Our study is consistent with the global trend, about 80% of surveyed radiologists experiencing moderate to high level of burn-out syndrome. Sever and moderate emotional exhaustion seen in 20%and 30% of participants respectively. Depersonalization ranked highest among radiologists with almost 70%. Personal accomplishment also showed high score of burnouts among nearly half of surveyed radiologists.

These results exhibit the variable aspects of the burnout nature and its consequence on the radiologists' personal lives and career. A study of Ferguson et al, investigating Canadian radiology residents verified that roughly half of all surveyed radiology residents suffering either depersonalization or high emotional exhaustion, these two factors of burnout were specially linked with increased work hours, poor life work balance, feelings of less supporting from staff radiologists, poor service-education balance, and common sadness with residency [13,14]. The bad impacts of burnout on doctors are not only affecting the quality of personal life, but also have impact on the patient care. These issues lead to many challenges involving worsening physical health, disturbed sleep pattern, tense interpersonal relations, all of that culminate dimmed life quality [5,11]. In this study, 56% of radiologist admitted had moderate sleep quality.

Burnout could result in absence from work, premature retirement and upsetting behavior [11]. Radiology is a field that constantly at the front position of science advance and technological alteration, furthermore, the new trend in the use of Artificial Intelligence (AI) in radiology gives feeling of uneasiness about this specialty [13]. Spuriously, in this research, almost half of radiologists consider give-up and changing their career. While nearly 70% stated that their work affecting their family life. Only 4% of participants sought medical advice and received prescribed medications to manage stress. Burnout may be visualized as "a viscous cycle" within the medical society, as burnout is linked with increased sickness and absence amongst doctors, this lead to intensify the workload and stress on colleagues who are still working. This aggravation in workload may afterwards increase the burnout risk, that probably result in negative response cycle that led to decline in quality of care and morals [5].

Fascinatingly, despite the high percentage of burnout among surveyed radiologists, 76% of them did not know about this syndrome before. This is a red flag to put-on more effort to raise awareness among doctors about this syndrome in terms of consequences and interventions. There are two intervention to mitigate the consequences of burnout among them, the first intended for persons that usually involve cognitive behaviors therapy, that would enhanced communication abilities and stress coping approaches .the second intended for organizations, that generally include easy changes in schedule, decreasing workload or even superior changes like alteration in professional evaluations, optimizing team work, raised involvement in decision making and supervising decrease in job demand [15].

Academic radiologists have a number of added stresses that lead to burnout. Canadian radiologists spend 4 hours per week on average on research [13]. One of the general causes of "research fatigue" to academic radiologists is not having time to think about novel ideas, a group in the USA advised one day / week at least conserved for academic work, and decreased academic time could worsen fatigue, causing exacerbation the symptoms of emotional exhaustion [9]. While in Spanish study, Teaching in the workplace was a protective factor [16]. In this study, there are a significant correlation between Burnout (Emotional exhaustion) and having administrative task or being a member of teaching staff ($r= 6.92$, $p< .05$) and ($r=5.8$, $p <0.05$).

Conclusion

Burnout is a universal problem, doctors are more prone to burnout due to the nature of their work and radiologists are not immune of these conditions, the burnout has negative impacts on health system as whole, including wellbeing of physicians and the quality of patient's care which may jeopardize patient's safety. This study showed the high prevalence of burnout among radiologists working in AMC, although a significant number of radiologists are not conscious of this syndrome, this raise the importance of increase the awareness and educations about burnout and it is consequences to make strategies to cope with it. Further studies should be considered to highlight these issues and its management in the region.

Conflict of interest. Nil

Received*: 27-11-2024 -* ***Accepted****: 09-01-2025 -* ***Published****: 16-01-2025*

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المستخلص

تعرف متلازمة الإحتراق من قبل منظمة الصحة العالمية بأنها متلازمة ناتجة عن ضغوط العمل المزمنة الغير معالجة ويعتبر هذا الأمر مصدر قلق متزايد بين المجتمعات المرتبطة بالصحة بسبب تأثيراته على جودة الخدمات الصحية وأداء العاملين وكذلك الصحة العقلية للعاملين في مجال الصحة. يحدث الإحتراق المرتبط بالعمل بين الأطباء أكثر من أولئك الذين يعملون في وظائف أخرى. وعلى مستوى العالم أظهرت الأبحاث انتشارا متزايدا للإحتراق بين أخصائيي الأشعة. هناك نقص في الأبحاث المتعلقة بهذا الموضوع في ليبيا لذلك فان الهدف من هذه الورقة هو تحليل انتشار الإحتراق الوظيفي والعوامل المرتبطة المحتملة بين أخصائيي الأشعة في مركز البيضاء الطبي ليبيا . دراسة مقطعية رصدية أجريت باستخدام مسح منظم يتضمن 3 أجزاء رئيسية:المعلومات الديموغرافية والعوامل المرتبطة المحتملة ومسح الخدمات البشرية لمخزون الإحتراق ماسلاك. تم جمع البيانات من 25 أخصائي أشعة و تحليلها باستخدام الارتباط عبر الجداول المتقاطعة. كشفت النتيجة أن حوالي 80% من أخصائيي الأشعة الذين شملهم الاستطلاع يعانون من مستوى متوسط إلى مرتفع من متلازمة الإحتراق. كان الارتباط مهما بين الإحتراق العاطفي والمهمه الإدارية وكونه عضوا في هيئة التدريس($r=6.92, p<0.05$) و($r=5.8, p<0.05$) ومن المثير للاهتمام إن 96% ذكروا إن الإجهاد أثناء العمل ينخفض بشكل كبير إذا قدم زملاء خبراء رأيا ثانيا. واقر 76% من أطباء الأشعة الذين شملهم الاستطلاع بتمديد ساعات عملهم و 44% منهم يفعلون ذلك بشكل متكرر. فكر تقريبا نصف أطباء الأشعة المشاركين في الاستطلاع في التوقف وتغيير حياتهم المهنية بينما ذكر ما يقرب من 70% إن عملهم يؤثر على حياتهم الأسرية، وتتفق نتيجة هذه الورقة مع الدول الغربية الأخرى. مع ذلك هناك حاجة إلى دراسة محلية مفصلة أخرى لمزيد من التحقيق في هذا النموذج المتعلق بالصحة وضرورة اتخاذ إجراءات للتخفيف من التأثير السلبي لهذه المتلازمة.

Received*: 27-11-2024 -* ***Accepted****: 09-01-2025 -* ***Published****: 16-01-2025*