Abstract

Purpose: The aim of this study is to identify burnout prevalence among ophthalmology residents and the predisposing factors associated with higher levels of burnout.

Methods: A cross-sectional study was conducted on all ophthalmology residents in Saudi Arabia using Maslach Burnout Inventory in January 2018. Associations between Emotional Exhaustion scores and other continuous variables were evaluated using Spearman’s correlation coefficients. Logistic regression model was constructed, and results were reported as odds ratios with 95% confidence intervals. The significance level was set at p < 0.05.

Results: A total of 117 residents responded to the survey with a 70% response rate. The response rate was above 65% for each training programs by region. 41% of ophthalmology residents scored a positive burnout result on the common subscales (Emotional Exhaustion and/or Depersonalization). Further sub-analysis of data showed positive Spearman’s correlation with number of call days per month and EE subscale (r 0.195). Multivariate logistic regression of the sample yielded significant results with satisfaction with work/life balance and choosing medicine again as a graduate level major p < 0.05. The regression model also showed the Southern program had significantly higher burnout on the common subscales p < 0.05.

Conclusions: Prevalence of burnout among ophthalmology residents was lower when compared to plastic surgery and otolaryngology residents in Saudi Arabia. Work hours and on call days were associated with higher burnout. Actions must be taken to ensure that all training programs implement work hour limitations. Special attention should be given to the Southern region program due to its significantly higher levels of burnout.

Keywords: Burnout, Ophthalmology, Residency, Saudi Arabia

Introduction

Burnout is a psychological state that can be explained and measured by three subscales, a feeling of emotional exhaustion, depersonalization, and low personal accomplishment. Although it can affect any person regardless of their profession, burnout is more prevalent among those who work in highly demanding jobs. Due to that, health care providers are at higher risk of burnout at any point in their career. The nature of hospital work is a main contributing factor to...
the problem, the long work hours, on-call days and lack of sleep can be physically strenuous to physicians and residents. Hospital work can also impact health care providers emotionally when they are dealing with difficult patients or breaking bad news. Coping with the physical and emotional stress is particularly more problematic early in career.

Medical residents are at an increased risk of occupational burnout. The shift from medical school life and sudden change in responsibilities might make residents feel doubtful of their own abilities and skills. In addition to the nature of their work, these factors can have a great impact on their performance and work outcomes. They will be more prone to medical errors, poor judgment and can become socially intolerable by their colleagues. Burnout can result in devastating results in healthcare, yet the data about its prevalence and associated risk factors are unfortunately insufficient.

It is important to identify the prevalence of burnout in our country in order to develop strategies that help in tackling the problem. In Saudi Arabia, 47% of plastic surgery residents experienced burnout. 45% of otolaryngology residents also expressed high levels of burnout. One third of Jeddah’s pediatricians and half of orthopedic residents in eastern province scored high in the emotional exhaustion. According to our knowledge, there is no published article that assesses the severity nor identifies the prevalence of burnout among ophthalmology residents in Saudi Arabia. The high prevalence of burnout among other specialties in our country makes us wonder where ophthalmology residents stand while there is an observed common belief that it is one of the least stressful specialties in the medical field.

Materials & methods

A cross-sectional study was conducted on the all ophthalmology residents in Saudi Arabia in January 2018 using Maslach Burnout Inventory (MBI) for Medical Personnel that was used in multiple previous published studies.3-8-10 The questionnaire consists of three subscales: Emotional Exhaustion (EE), Depersonalization (DP) and Personal Accomplishment (PA). The questionnaire consists of 22 questions that are scored as a 7-point Likert scale ranging from 0 to 6. The score of each subscale was summed and categorized as high, moderate or low. Scoring 27 or more on EE, 13 or more on DP or 31 or less on PA is highly indicative of burnout. In this paper, residents who scored 27 or more on EE or 13 or more on DP were considered displaying burnout. The survey also collected some demographic data to identify their correlation with burnout. The demographics were: gender, residency level, training program, marital status, number of clinic and operation days per week, number of call days per month and average sleep hours per night. At the end of the survey, residents were asked if they would have chosen medicine as a college specialty again and ophthalmology as a carrier choice. They were also asked if they were satisfied with their work/life balance. Contact information of all ophthalmology residents was obtained from the Saudi Communion for Health Specialties. An individual e-mail invitation was sent with a unique serial number to each resident. Those who did not respond to the email were contacted by phone as a reminder. It was clearly explained that the serial number was used for tracking responses and kept confidential. The word “burnout” was not mentioned in the invitation or the questionnaire to minimize bias. Completed questionnaires were transferred to STATA 14 software for Windows (STATA Corp., College Station, TX) software to be managed and analyzed. Descriptive statistics of the participating physicians were summarized as percentages and frequencies for categorical variables; medians and quartiles were used to describe continuous variables. Chi-square tests or Fisher’s exact tests, when appropriate, were used to determine associations between categorical variables. Associations between Emotional Exhaustion scores and other continuous variables were evaluated using Spearman’s correlation coefficients. Logistic regression model was constructed using physician burnout as the dependent variable and results were reported as odds ratios (OR) with 95% confidence intervals (95% CI). The significance level was set at p < 0.05. The study (approval #RC17/284/R) was approved by the Institutional Review Board (IRB) at King Abdullah Medical Research Center, the Ministry of National Guard Health Affairs (MNGHA), Riyadh, Saudi Arabia.

Results

A total of 117 residents out of 166 responded to the survey after the exclusion of two residents, one is a co-author in our study and the other transferred to a training program abroad, with a 70% response rate. Sample male to female ratio was 1.2. Female response rate was higher at 81% while the male response rate was 63%. The response rate of each training programs by region was above 65%. Majority of the sample 61% were single. Table 1 shows full descriptive results of the sample included. The residents in our study had a median of 6 on-call days per month, a median of 4 clinic days per week, a median of 1.5 operation days per week, and slept a median of 6 h per day. More than half the sample 58% were satisfied with their work life balance. Almost all residents 96% would have chosen ophthalmology again as a career choice. However, a lesser proportion 84% would have chosen medicine again for graduate level study.

Based on the questionnaire subscales described in the methods section, the results show 41% of ophthalmology residents scoring a positive burnout result on the common subscales (EE and/or DP). Table 2 shows detailed subscale scores.

Further sub-analysis of the data showed positive Spearman’s correlation with number of on call days per month and EE subscale (r 0.195) Table 3.

Multivariate logistic regression of the sample using burnout as an outcome accounting for all variables yielded significant results with two of the 10 variables in the questionnaire, satisfaction with work/life balance and choosing medicine again as graduate level study major p ≤ 0.05. The regression model also showed one program among the seven included throughout the kingdom with significantly higher burnout on the common subscales p ≤ 0.05 Table 4.

Discussion

In accordance with the vision of providing optimal health care in all regions of Saudi Arabia, Ministry of Health (MOH) with the supervision of the Saudi Commission for Health Specialties (SCFHS) are aiming to establish training programs in all medical specialties in different areas of Saudi
Arabia. Ophthalmology training programs are among those programs that were established in every region of Saudi Arabia due to the worrisome diseases affecting the eye that may lead to blindness or other serious complications in a country with high prevalence of diabetes and hypertension. There are currently seven ophthalmology programs across the country that aim to prepare a sufficient number of well-trained ophthalmologists that serve each region. Of the seven programs, the southern training program residents showed twenty times odds ratio of burnout.

| Demographic variables       | N  | Percentage (%) |
|-----------------------------|----|----------------|
| Gender                      |    |                |
| Male                        | 63 | 53.85          |
| Female                      | 54 | 46.15          |
| Residency level             |    |                |
| PGY-1                       | 35 | 29.91          |
| PGY-2                       | 35 | 29.91          |
| PGY-3                       | 21 | 17.95          |
| PGY-4                       | 26 | 22.22          |
| Training program            |    |                |
| KKESH                       | 13 | 11.11          |
| KSU                         | 13 | 11.11          |
| Central Joint               | 34 | 29.06          |
| Eastern Joint               | 20 | 17.09          |
| Western Joint               | 21 | 17.95          |
| Madinah                     | 6  | 5.13           |
| Southern Joint              | 10 | 8.55           |
| Marital status              |    |                |
| Single                      | 71 | 60.68          |
| Married                     | 46 | 39.32          |
| Are you satisfied with your work/life balance? | Yes | 68 | 58.12 |
|                              | No | 49 | 41.88 |
| Would you have chosen medicine for graduate level study again? | Yes | 98 | 83.76 |
|                              | No | 19 | 16.24 |
| Would you have chosen ophthalmology as a specialty again? | Yes | 112 | 95.73 |
|                              | No | 5  | 4.27 |
| Clinic days per week Mean(SD) | 3.75 (0.87) |
| Operation days per week Mean(SD) | 1.36 (0.54) |
| Call days per month Mean(SD) | 6.06 (1.90) |
| Sleep hours per night Mean(SD) | 5.92 (0.94) |

Table 2. Burnout indicators.

| Burnout indicators                     | Freq. | Percentage |
|----------------------------------------|-------|------------|
| Emotional Exhaustation                 |       |            |
| Low                                    | 32    | 27.35      |
| Moderate                               | 41    | 35.04      |
| High                                   | 44    | 37.61      |
| Depersonalization                      |       |            |
| Low                                    | 61    | 52.14      |
| Moderate                               | 36    | 30.77      |
| High                                   | 20    | 17.09      |
| Personal Achievement                   |       |            |
| Low                                    | 41    | 35.04      |
| Moderate                               | 39    | 33.33      |
| High                                   | 37    | 31.62      |
| Burnout                                |       |            |
| No                                      | 69    | 58.97      |
| Yes*                                    | 48    | 41.03      |
| Total                                   | 117   | 100        |

* Burnout = Yes if EE = High or DP = High.

The southern joint program was founded in 2014 with 12 residents in different years. Two residents are currently in their final year and no one has completed the program yet. The fact that the program is relatively new and not part of a university hospital could be perceived as one of contributing factors to residents’ burnout. Furthermore, only two of the southern program residents were from the southern region. Being from another city away from friends and relatives and the need to travel more that requires many housing arrangements could be potential stressors. Residents in many programs might face different challenges some of which exceed their coping ability resulting in burnout. Identifying these challenges will help program directors overcome them and improve the quality of the educational environment for current and future residents.

Shift and overtime work is a common practice in the medical field that aims to provide around the clock coverage of personnel in case of emergencies. Without rules that regulate on-call scheduling, it can have negative impact on the residents’ wellbeing consequently becoming a health risk to both residents and patients. Our results demonstrated that on-call days were the only significant factor associated with higher levels of burnout. It can also be stressful for residents to balance between their work and personal life given the unpredictability of call scheduling. In our study, 42% of ophthalmology resident were not satisfied with their work/life balance which had a statistically significant impact on their burnout. This effect is more pronounced when residents must work overtime post-call lacking enough sleep. Studies have shown that shift work worsens existing medical conditions, disrupts sleep patterns, and increases the risk of cardiac diseases, digestive disorders, and sexual dysfunction. Therefore, many countries decided to take actions to ensure that shift work as well as work hours are up to a standard that is not overwhelming for medical residents.

The number of resident’s work hours has been alarming for a long time due to the obvious comprehension that tired and inexperienced young doctors are prone to more medical errors and slip-ups. So far there is a vast difference in the guidelines issued over the actual work hours of the educational environment for young professionals. These differences are seen among countries and within those countries themselves. The novel motivation for resident’s work time modification started in New York in 1984 after the death of a patient who was under the care of two sleep-deprived residents. As a result, the state of New York implemented residents’ duty hour limit guidelines in 1989. In 2017, firsthand
requirements were distributed by the Accreditation Council for Graduate Medical Education (ACGME) which set the extreme continuous hours of work to 24 h for all residency programs excluding emergency medicine that is restricted to 12 h and a minimum rest period of 11 succeeding hours per every 24-hour call. Resident’s quality of life showed significant improvements after the implementation of work hour limits.12–15

Numerous countries around the globe started to take actions that reduce physicians’ burnout. In 1998, the European Work Time Directive (EWTD) converted to a law that was released by the Council of Europe that aims to safeguard the health and wellbeing of every worker in the European Union. This law minimizes doctors working hours to 48 h per week. Although information about the implementation of the law in European countries needs extensive evaluation, literature shows that Denmark has been implementing the EWTD law and they have a typical work week of 37 h.16 Germany, Netherlands, Finland, Sweden and Norway are thought to be compliant to the law. Although the United Kingdom implements EWTD law, reports show that about a quarter of residents are working more than 48-hours.17 This proves that the implementation of worktime limit laws requires continuous monitoring by regulating authorities. In Canada on the other hand work hours were dictated by individual resident-hospital contracts which in most cases did not explicitly mention the time limits. This caused tremendous abuse to the wellbeing of junior physicians by hiring authorities which gave rise to a system that does not allow shifts to exceed 16-hours established by the Royal College of Physicians and Surgeons of Canada.18 In Saudi Arabia, SCFHS sketches rules for on-calls in training programs; as in case of some, program manuals display that the typical calls for junior residents and for senior residents ought to be seven per month and six per month respectively. Moreover, calls must not exceed 24 hours without any law regulating the total of work hours for each week.19

There are multiple strategies that might help prevent or reduce burnout among ophthalmology residents on both the individual and institutional level.20 One of the effective strategies for preventing burnout is having counseling sessions and workshops. A study, on a group of residents, found that those who participated in self-care workshops over a period of two months showed significant improvement in the depersonalization domain compared to those who did not.21 Mindfulness-based interventions could also help in the reduction of all the three domains of Maslach Burnout Inventory. Healthcare providers who took a course on mindfulness-based stress reduction for two and half hours a week over a period of two months showed substantial improvements in burnout scores and mental well-being.22 Furthermore, taking vacations and having time for exercise and personal hobbies can contribute to reducing the level of burnout.23,24 According to Maslach, strategies targeting individual efforts to prevent burnout are less effective in the workplace, whereas the implementation of solutions at an organizational level is more effective.20

Almost all, 98%, of the ophthalmology program directors in the U.S claimed that their residents have a free access to wellness programs.25 However, more than half of the resi-

### Table 4. Multivariate logistic regression of the sample.

|                        | Burnout odds Ratio | p value | [95%Conf.Interval] |
|------------------------|-------------------|---------|--------------------|
| Gender                 |                   |         |                    |
| Male                   | 1.00              |         |                    |
| Female                 | 0.86              | 0.78    | 0.29               | 2.52               |
| Residency level        |                   |         |                    |
| PGY-1                  | 1.00              |         |                    |
| PGY-2                  | 1.24              | 0.74    | 0.35               | 4.40               |
| PGY-3                  | 5.34              | 0.06    | 0.94               | 30.33              |
| PGY-4                  | 0.60              | 0.52    | 0.12               | 2.88               |
| Training program       |                   |         |                    |
| KKESH                  | 1.00              |         |                    |
| KSU                    | 4.00              | 0.29    | 0.31               | 50.92              |
| Central Joint          | 8.22              | 0.06    | 0.94               | 71.92              |
| Eastern Joint          | 4.37              | 0.24    | 0.38               | 50.13              |
| Western Joint          | 5.43              | 0.13    | 0.59               | 49.75              |
| Madinah                | 6.29              | 0.18    | 0.42               | 94.75              |
| Southern Joint         | 20.04             | 0.03*   | 1.34               | 299.03             |
| Marital status         |                   |         |                    |
| Single                 | 1.00              |         |                    |
| Married                | 0.51              | 0.23    | 0.17               | 1.53               |
| Clinic days per week   | 1.08              | 0.81    | 0.56               | 2.10               |
| Operation days per week| 0.47              | 0.13    | 0.18               | 1.24               |
| Call days per month    | 1.05              | 0.76    | 0.78               | 1.40               |
| Sleep hours per night  | 0.98              | 0.95    | 0.58               | 1.68               |
| Are you satisfied with your work/life balance? | | | |
| Yes                    | 1.00              |         |                    |
| No                     | 3.45              | 0.02*   | 1.26               | 9.45               |
| Would you have chosen medicine for graduate level study again? | | | |
| Yes                    | 1.00              |         |                    |
| No                     | 6.30              | 0.02*   | 1.27               | 31.17              |
| Would you have chosen ophthalmology as a specialty again? | | | |
| Yes                    | 1.00              |         |                    |
| No                     | 0.39              | 0.45    | 0.03               | 4.47               |

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dents were unaware of the availability of these services or how to access them, while one-fourth of the residents did not have enough time to attend counseling and behavioral services. The 2015 VITAL Work Life Physician Stress and Burnout Survey showed that only 18% of the physicians felt their organizations offered help to deal with stress and burnout. In addition to the work hour limitation reducing burnout at institutions level can be done by using some strategies such as: implementing a reward system, optimizing infrastructure, and appointing a mentor. It is also important to reduce work overload and increase physician’s autonomy showing acknowledgment for their hard work and engaging them in leadership opportunities.

Finally, our inclusion of all ophthalmology residents from different training programs in Saudi Arabia and the 70% response rate provide strength to our study. The 30% non-response rate could be a potential source of bias, yet we do believe that the overall response rate is considered reasonable and representative of all ophthalmology residents in Saudi Arabia.

Conclusions

Prevalence of burnout among ophthalmology residents was lower when compared to plastic surgery and otolaryngology residents in Saudi Arabia. Work hours and on call days were associated with higher burnout. SCFHS must take actions to ensure that all training programs implement work hour limitations. Special attention should be given to the Southern Region Joint Program due to its significantly higher level of burnout.

Conflict of interest

The authors declared that there is no conflict of interest.

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