

# Quality of life among otolaryngology and head and neck surgery residents in Saudi Arabia: A cross-sectional study

Almutairi Abdullah Alhumaidi<sup>1</sup>, Alhajlah, Abdullah A<sup>3</sup>, Aljurfi, Muhamad M<sup>3</sup>, Alkharashi, Abdullah A<sup>1</sup>, Alqahtani Faisal A<sup>3</sup>, Alkhatabi Reema A<sup>1</sup>, Alqahtani Norah Y<sup>2</sup>, Hajr Eman A<sup>4</sup>, Alotaibi Fahad Z<sup>4</sup>.

(1) Medical Intern, college of medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

(2) Dental Intern, college of dentistry, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia

(3) Medical student, college of medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

(4) Department of Otolaryngology, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

## Corresponding author:

Alqahtani Norah Y

Intern, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia

**Email:** Norah.y.Alqahtani@gmail.com

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## Abstract

**Introduction:** The surgical residency training programs have the nature of long work hours and a stressful environment that might lead to disturbances in the quality of life of the residents. Surgical residents' performance might be affected by the poor quality of life.

This study aimed to assess the quality of life of otolaryngology and head and neck surgery residents, in Saudi Arabia.

**Subjects and methods**

This is a cross-sectional study conducted among otolaryngology and head and neck surgery residents in Saudi Arabia. A self-administered questionnaire was distributed among the targeted residents. The questionnaire is primarily composed of the socio-demographic data and the work-related quality of life (WRQoL) questionnaire. The WRQoL was composed of 6 domains as General Well-Being (GWB), Home-Work Interface (HWI), Job and Career Satisfaction (JCS), Control at Work (CAW), Working Conditions Satisfaction (WCS), and Stress at Work (SAW).

**Results:** The overall work-related quality of life was good among 43.6% of the residents. Among its domains, WCS showed better results with a 55.3% high level while SAW was the least (25.5%). Older age group ( $\geq 30$  years) were observed to have a significantly higher mean score in JCS ( $p=0.040$ ), CAW ( $p=0.002$ ) and WRQoL ( $p=0.027$ ). Smoking residents showed a higher mean score in JCS ( $p=0.023$ ) and HWI ( $p=0.001$ ). It is interesting to note that increasing residency levels were more associated with increasing CAW scores ( $p=0.003$ ).

**Conclusion:** The work-related quality of life among otolaryngology, head and neck surgical residents was adequate. Older residents demonstrated a better quality of life than younger residents.

**ACGME competencies:** Medical knowledge, Patient care, Interpersonal skills communication.

**Keywords:** Quality of life, WRQoL, otolaryngology, head and neck surgery, residents

## Introduction

The life of a physician and especially surgeons has to be balanced between social life and work-related duties. If this balance is unstable and disorganized this may have a negative effect on the healthcare system and patient care. Surgical residency training has the nature of long work hours due to the demand of this field and the stressful environment that the resident has may damage the quality of life of the surgeons. Nevertheless, the workload is different based on the specialty and personal level of professionalism of the surgeon [1].

A review was made in 2016, suggesting that challenges and high risks of surgery are associated with a stressful environment; Furthermore, satisfaction and performance are related to this matter [2]. The close relatives of the surgeon may get involved in the stress and burnout, and it is due to the long working hours, especially among the surgical field residents [3].

Surgeons working hours and the amount of stress and burnout have been addressed recently and have gained more attention [4]. A study conducted in Germany found that the psychological stress in the surgical field has caused severe stress, more than in the other fields [5]. Another study published in 2018, revealed that depression and burnout among residents were the results of increased levels of stress [6]. Burnout may eliminate professionalism, potentiate high chances of medical errors, and may lead to substance abuse and relationship difficulty which will ultimately have an effect on the quality of life of the surgeons [7]. Some studies have shown that surgeons' distress has a strong impact on perceived medical errors with 5% to 11% higher incidences of reporting a major medical error [8].

Therefore, quality of life of the medical physician is impacted by any domain and will be reflected in the patient care which is the top priority in any medical institute. Up till now, there is no study showing or evaluating the work-related quality of life of the residents, especially ENT residents here in Saudi Arabia. The goal of this study is to assess the quality of life of ENT residents and identify the elements that influence their quality of life.

## Subjects and Methods

### A. Study subjects

This study is a descriptive cross-sectional questionnaire-based study design of all resident doctors in otolaryngology and head and neck surgery in all regions of Saudi Arabia, conducted from November 2021 through to February 2022. Residents were randomly selected and asked to take part in an online-based survey. The inclusion criteria included being an ORL-HNS resident aged 24-31 in Saudi Arabia.

### B. Tool and sample size

The sample size is estimated to be 95 participants, large enough to reach a confidence interval of 95% as calculated using the Raosoft Sample Size Calculator (Raosoft, Inc. Seattle, WA). The study is utilized by the Work-Related Quality of Life by WRQoL valid scale first edition that measures perceived quality of life in six important domains: General Well-Being (GWB), Home-Work Interface (HWI), Job and Career Satisfaction (JCS), Control at Work (CAW), Working Conditions (WCS) and Stress at Work (SAW) Each question uses a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) developed by Simon Easton and Darren Van Laar[10], as well as adding to it the demographic data questions asking about age, gender, resident level, what city and what hospital they work in. The validity and reliability of the questionnaire was tested by the authors [14].

### C. Ethical Consideration

As part of the study, all participants were adequately informed about the aim of the study. They were recruited by their acceptance. This study was reviewed and approved by the Ethics Committee for Human Research of Imam Muhammed Ibn Saud Islamic University.

### D. Statistical Analysis

Categorical variables were measured as frequency and proportion (%) while continuous variables were expressed as mean and standard deviation. The difference in the overall score of WRQoL and its domains in relation to the socio-demographic characteristics of the residents was performed using Mann Whitney Z-test as well as Kruskal Wallis H-test. A P-value of 0.05 was considered statistically significant while a p-value of 0.01 was considered highly statistically significant. Normality test was performed using Shapiro Wilk test. The overall score of WRQoL and its domains follows the non-normal distribution. Thus, the parametric tests were applied. Pearson correlation coefficient was also performed to determine the correlation between the overall WRQoL among its domains. All data analyses were performed using the Statistical Packages for Software Sciences (SPSS) version 26 (Armonk, New York, IBM Corporation, USA.).

## Results

Our study, a total of 94 otolaryngology and head and neck surgery residents was able to recruit 50% females vs 50% males. The most common age group was 24 – 29 years old (77.7%) with nearly two-thirds (63.8%) being single. Only 13.8% of the residents were smokers. Residents who were living in the Eastern region constituted (43.6%). In addition, 24.5% were resident level 1 and another 24.5% were resident level 2 [Table 1].

In the assessment of WRQoL, the mean score of JCS, CAW, GWB, HWI, SAW, and WCS domains were 3.61, 3.32, 3.21, 3.23, 2.66 and 3.48, respectively and the overall mean score of WRQoL was 3.17 (SD 0.39). Further details of residents' rating for each statement of the WRQoL questionnaire are given in Table 2. As explained in Figure 1, 43.6% of the respondents were considered as having a high level of WRQoL, 26.6% had average and the rest were low level (29.8%). Among WRQoL domains, WCS showed more high level (55.3%), followed by CAW (41.5%), HWI (38.3%), GWB (38.3%), JCS (38.3%) and SAW (25.5%).

There was a positive highly statistically significant correlation observed between the overall WRQoL among its domain and including JCS score ( $r=0.853$ ), CAW score ( $r=0.484$ ), GWB score ( $r=0.919$ ), HWI score ( $r=0.749$ ) and WCS score ( $r=0.794$ ). On the other hand, an inverse highly statistically significant correlation was observed between WRQoL score and SAW score ( $r=-0.677$ ) [Table 3].

Table 4 shows that the only significant factor of overall WRQoL was the age group in years ( $p=0.027$ ), where a higher score of overall WRQoL was significantly predicted among the older age group ( $\geq 30$  years). Other variables included in the test did not show significant differences in the overall WRQoL score including marital status, smoking, region of the residency program and residency year level ( $p>0.05$ ).

A higher JCS mean score ( $p=0.040$ ) and CAW score ( $p=0.002$ ) were more associated with older age group (age  $\geq 30$  years) while the differences in the scores of GWB, HWI, SAW, and WCS among the age group did not reach statistical significance ( $p>0.05$ ) [Figure 2].

According to Figure 3, a raised SAW mean score was more associated with female surgeons ( $p=0.011$ ) while the differences between the mean scores of JCS, CAW, GWB, HWI and WCS did not reach statistical significance ( $p>0.05$ ).

JCS score was higher and more associated with smoking participants ( $p=0.023$ ) while the SAW score was more associated with non-smoking participants ( $p=0.001$ ) whereas the differences between the mean scores of CAW, GWB, HWI, and WCS were not significantly different ( $p>0.05$ ).

A higher CAW score ( $p=0.003$ ) was more associated with resident level 5 while the differences between the mean scores of JCS, GWB, HWI, SAW, and WCS were not significantly different ( $p>0.05$ ) [Figure 5].

**Table 1: Socio-demographic characteristics of the residents (n=94)**

Study variables	N (%)
Age group	
• 24 – 29 years	73 (77.7%)
• 30 – 34 years	17 (18.1%)
• 35 – 40 years	04 (04.3%)
Gender	
• Male	47 (50.0%)
• Female	47 (50.0%)
Marital status	
• Single	60 (63.8%)
• Married	34 (36.2%)
Smoking	
• Yes	13 (13.8%)
• No	81 (86.2%)
Region of residency program	
• Central Region	25 (26.6%)
• Eastern Region	41 (43.6%)
• Western Region	24 (25.5%)
• Southern Region	03 (03.2%)
• Northern Region	01 (01.1%)
Residency year level	
• R1	23 (24.5%)
• R2	23 (24.5%)
• R3	21 (22.3%)
• R4	14 (14.9%)
• R5	13 (13.8%)

**Table 2: Assessment of Work-related Quality of Life (WRQoL) (n=94)**

Statement	Mean ± SD
<b>Job and Satisfaction (JCS) score</b>	3.61 ± 0.74
1. I have a clear set of goals and aims to enable me to do my job	4.02 ± 0.84
2. I have the opportunity to use my abilities at work	3.87 ± 0.91
3. When I have done a good job it is acknowledged by my line manager	3.45 ± 1.09
4. I am encouraged to develop new skills	3.76 ± 0.96
5. I am satisfied with the career opportunities available for me here	3.32 ± 1.13
6. I am satisfied with the training I receive in order to perform my present job	3.22 ± 1.09
<b>Control at Work (CAW) score</b>	3.32 ± 0.56
7. I feel able to voice opinions and influence changes in my area of work	3.10 ± 0.93
8. I am involved in decisions that affect me in my own area of work	3.52 ± 0.94
9. I am involved in decisions that affect members of the public in my own area of work	3.34 ± 0.91
<b>General well-being (GWB) score</b>	3.21 ± 0.51
10. I feel well at the moment	3.37 ± 1.08
11. Recently, I have been feeling unhappy and depressed	2.35 ± 0.95
12. I am satisfied with my life	3.65 ± 0.95
13. In most ways my life is close to ideal	3.05 ± 1.03
14. Generally things work out well for me	3.49 ± 0.85
15. Recently, I have been feeling reasonably happy all things considered	3.37 ± 0.92
<b>Home-work interference (HWI) score</b>	3.23 ± 0.79
16. My employer provides adequate facilities and flexibility for me to fit working around my family life	3.27 ± 0.96
17. My current working hours/patterns suit my personal circumstances	3.35 ± 0.96
18. My line manager actively promotes flexible working hours/patterns	3.06 ± 0.96
<b>Stress at Work (SAW) score</b>	2.66 ± 0.89
19. I often feel under pressure at work	2.55 ± 1.09
20. I often feel excessive levels of stress at work	2.78 ± 1.09
<b>Working Conditions (WCS) score</b>	3.48 ± 0.73
21. My employer provides me with what I need to do my job effectively	3.44 ± 0.89
22. I work in a safe environment	3.64 ± 0.93
23. The working conditions are satisfactory	3.36 ± 0.89
<b>Overall WRQoL score</b>	3.17 ± 0.39

5-point Likert scale response ranging from “strongly disagree” coded as 1 to “strongly agree” coded as 5.

\* Indicates negative question.

**Table 3: Correlation (Pearson-r) between overall WRQoL score among its domains (n=94)**

WRQoL domains	Total WRQoL score	
	R-value	P-value
JCS	0.853	<0.001 **
CAW	0.484	<0.001 **
GWB	0.919	<0.001 **
HWI	0.749	<0.001 **
SAW	-0.677	<0.001 **
WCS	0.794	<0.001 **

\*\* Correlation is significant at the 0.01 level (2-tailed).



**Table 4: Differences in the score of WRQoL and its domains according to the Socio-demographic characteristics of the surgical residents (n=94)**

Factor	WRQoL Total score (5) Mean $\pm$ SD	Z/H-test	P-value $\S$
Age group $\text{a}$			
• <30 years	3.12 $\pm$ 0.37	<b>Z=2.212</b>	<b>0.027 **</b>
• $\geq$ 30 years	3.34 $\pm$ 0.44		
Gender $\text{a}$			
• Male	3.19 $\pm$ 0.38	<b>Z=0.617</b>	<b>0.537</b>
• Female	3.16 $\pm$ 0.41		
Marital status $\text{a}$			
• Single	3.14 $\pm$ 0.34	<b>Z=1.040</b>	<b>0.299</b>
• Married	3.22 $\pm$ 0.47		
Smoking $\text{a}$			
• Yes	3.29 $\pm$ 0.36	<b>Z=1.524</b>	<b>0.128</b>
• No	3.15 $\pm$ 0.39		
Region of residency program $\text{b}$			
• Central Region	3.16 $\pm$ 0.37	<b>H=2.051</b>	<b>0.359</b>
• Eastern Region	3.23 $\pm$ 0.37		
• Other Regions	3.09 $\pm$ 0.45		
Residency year level $\text{b}$			
• R1	3.24 $\pm$ 0.33	<b>H=3.218</b>	<b>0.522</b>
• R2	3.09 $\pm$ 0.40		
• R3	3.25 $\pm$ 0.42		
• R4	3.12 $\pm$ 0.33		
• R5	3.12 $\pm$ 0.51		

$\S$  P-value has been calculated using Mann Whitney Z-test.

$\ddagger$  P-value has been calculated using Kruskal Wallis H-test.

\*\* Significant at  $p < 0.05$  level.

Figure 1: Level of WRQoL and its domains

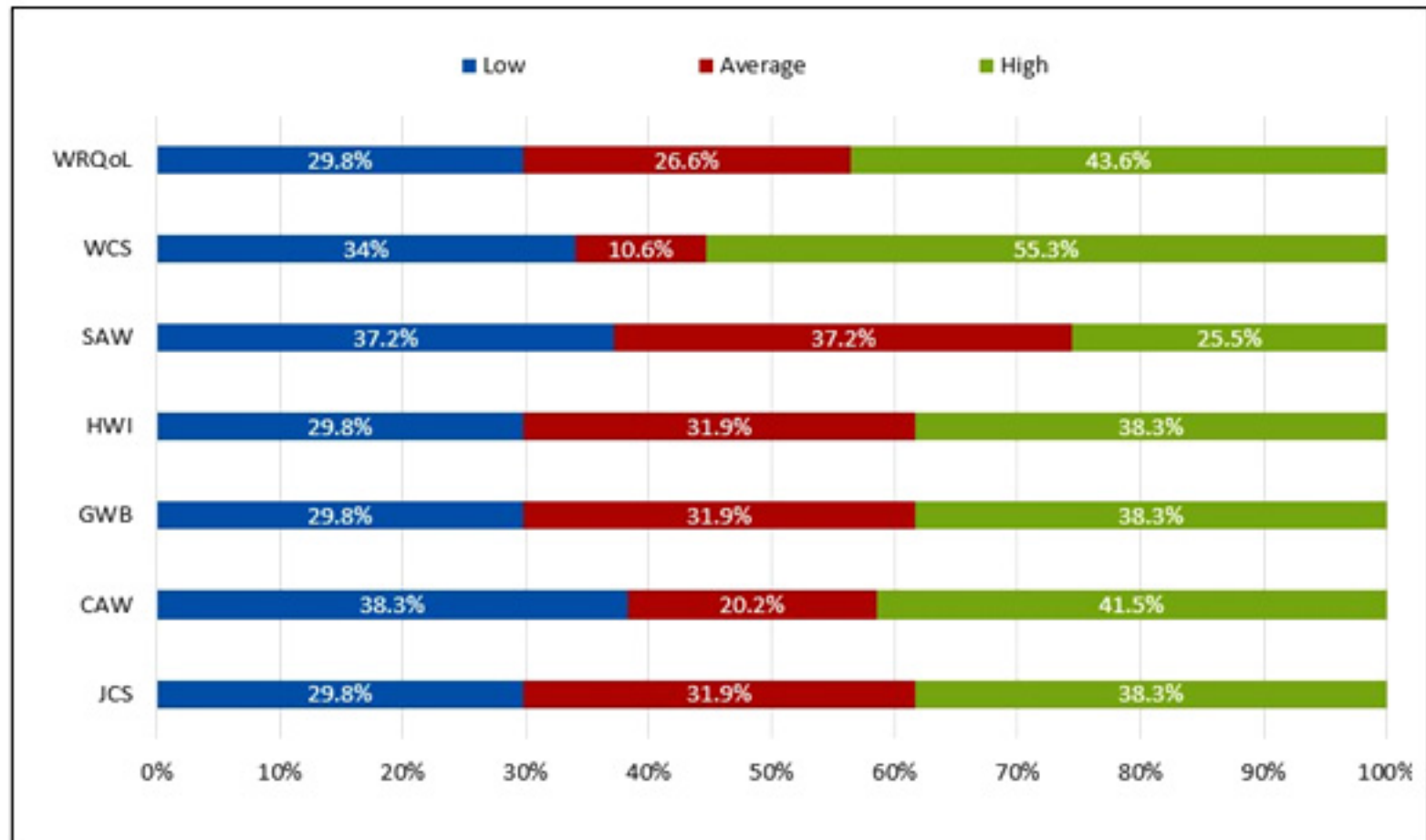


Figure 2: Comparison between mean scores of the WRQoL domains according to age group

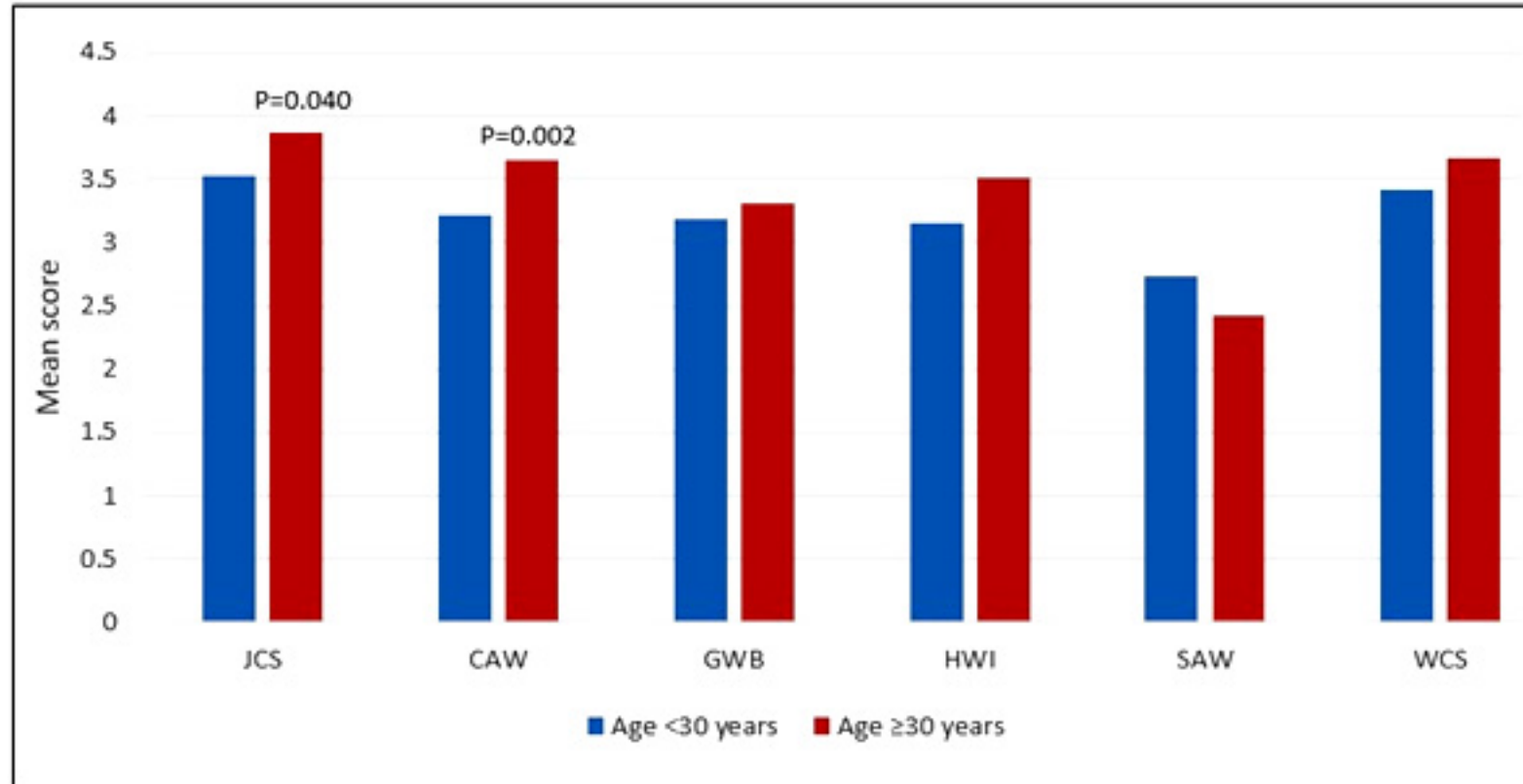


Figure 3: Comparison between mean scores of the WRQoL domains according to Gender

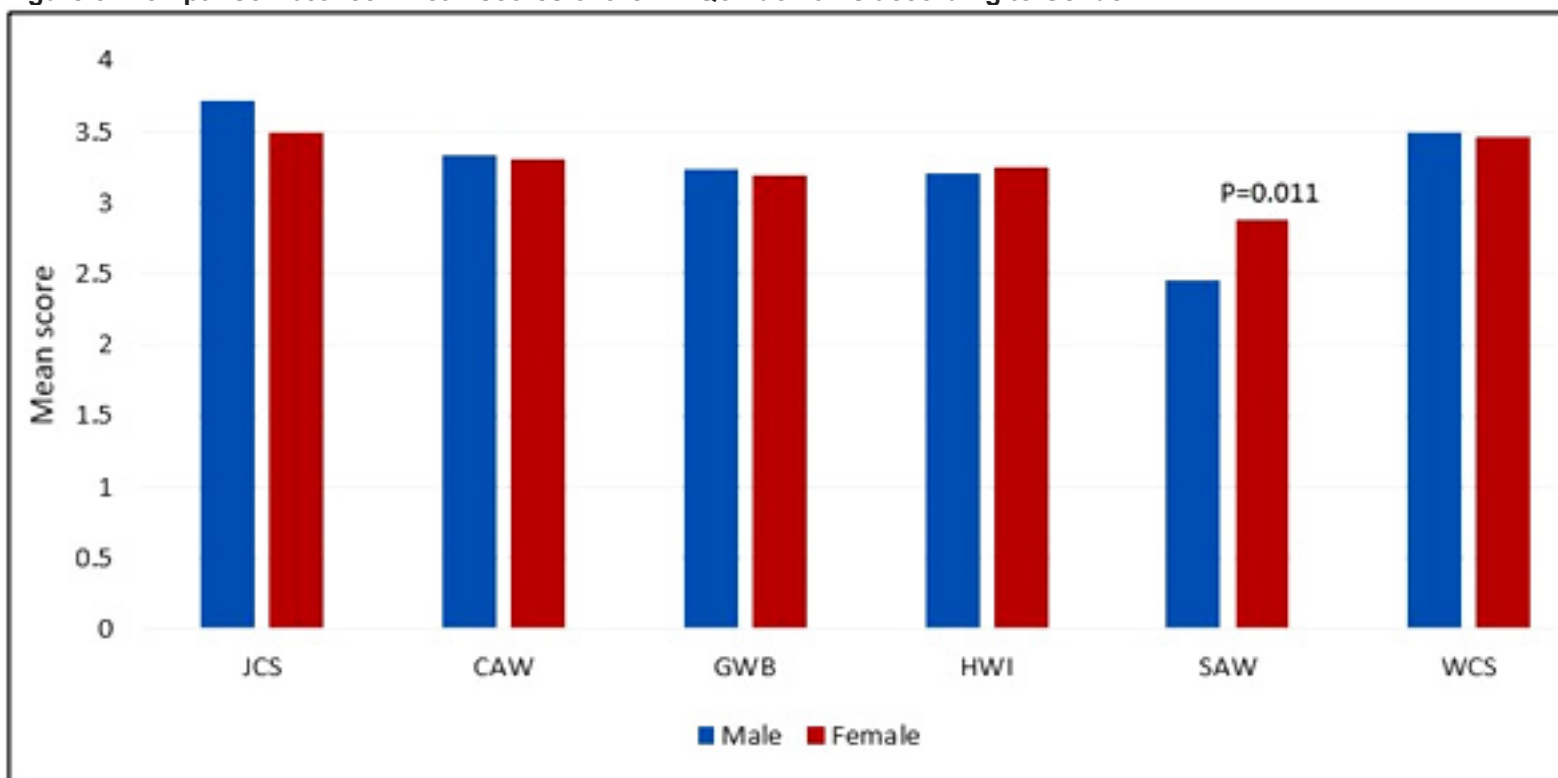
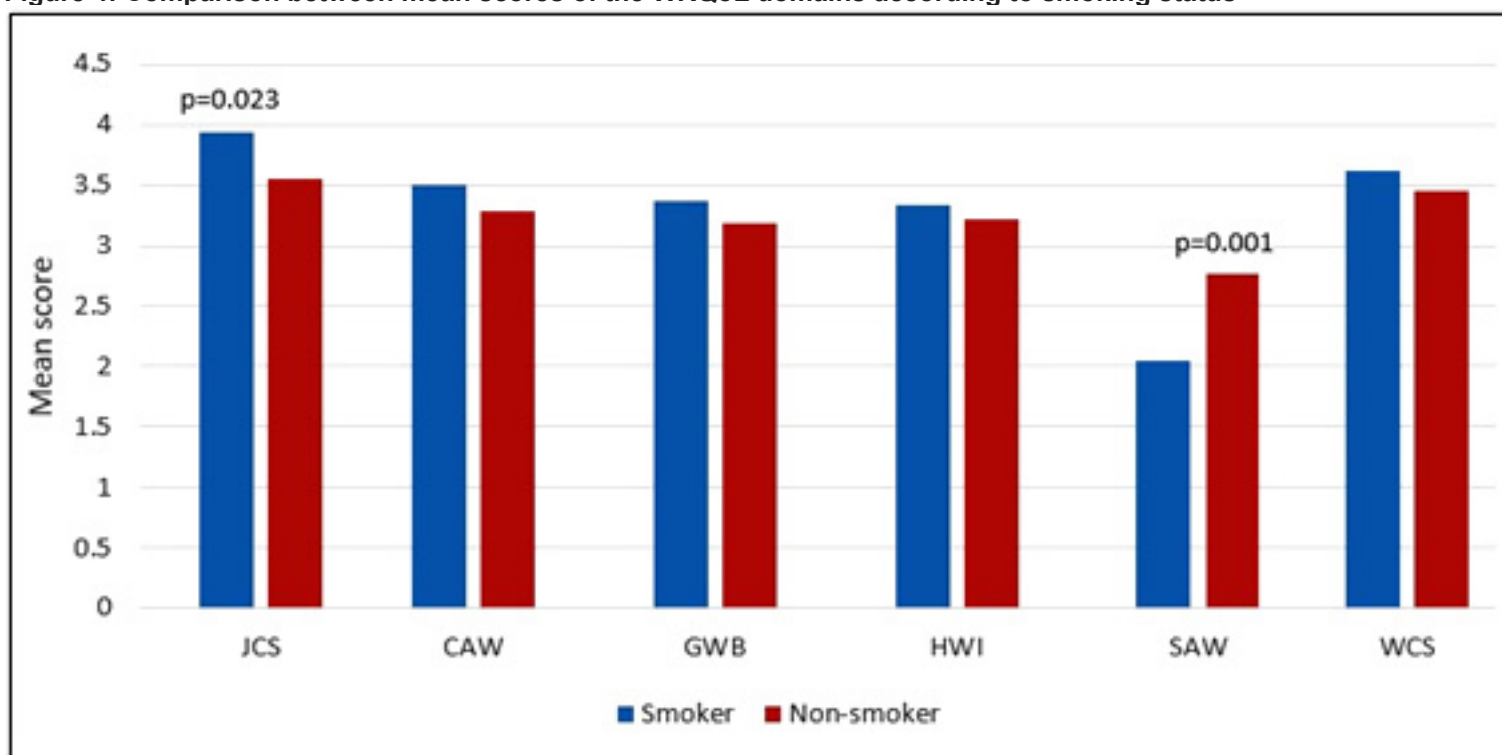
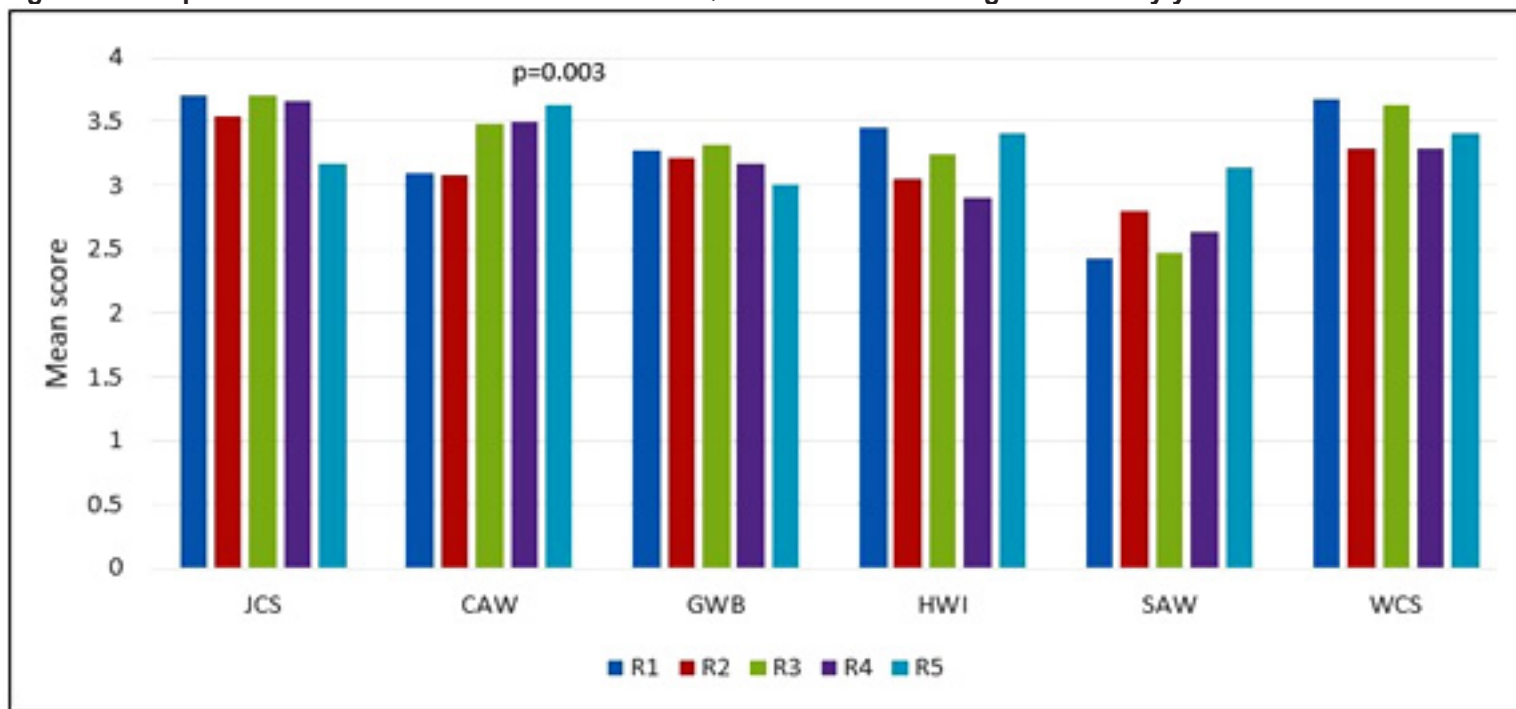


Figure 4: Comparison between mean scores of the WRQoL domains according to smoking status





**Figure 5: Comparison between mean scores of the WRQoL domains according to residency year level**

## Discussion

The present study was carried out to examine the work-related quality of life among otolaryngology, head and neck surgical residents. To our knowledge, this is the first study in Saudi Arabia that discussed the overall health-related quality of life among otolaryngology, head and neck residents. Since residency training is a very stressful environment that demands a lot of time, it is very important to examine their quality of life. The findings of this study will serve as a baseline subject for further investigations.

### Work-related Quality of Life (WRQoL)

The overall WRQoL of residents with otolaryngology, head, and, surgery specialty was sufficient; 43.6% of the residents demonstrated a high level of WRQoL, 26.6% were average and 29.8% were considered as low level (mean score: 3.17; out of 5 points). Adequate work-related quality of life had also been reported by Somila et al. [10]. According to their reports, 76.6% of the medical surgeons exhibited a moderate level of work-related QoL. They further predicted that working hours and the number of shifts likely played a significant role in having a good quality of work-life. However, in Jeddah, Saudi Arabia [9], researchers reported that the quality of life among surgical residents was poor, as half of the residents (50.7%) demonstrated a low WRQoL. They argued that the low QoL was attributed to the poor rating in some WRQoL domains including HWI, CAW, SAW, and GWB. In a survey done among German surgeons [11], approximately 40% of the German surgeons considered their quality of life worse than the general population while the minority of them even considered their QoL lower than their patients. The authors emphasized the need to improve the working conditions of the surgeons which require collective efforts from the concerned parties including hospital administrations, insurance companies, and the German Society of Surgery. The causes of declined work-related QoL must be

identified and necessary steps should be taken to address the gaps. An improved WRQoL will lead to better patient quality of care.

A higher WRQoL was significantly predicted among the older age group ( $\geq 30$  years), but the quality of life did not differ significantly between gender, marital status, region of the resident program, and residency year level. A survey conducted among Brazilian otorhinolaryngology residents showed that males demonstrated better psychological scores than females, and when they measured ENT residents' quality of life, they assumed that the QoL of ENT residents in the Federal Districts is comparable to those of a healthy population, although, second-year residents yielded better quality of life results compared to first-year and third-year residents [14]. In an opposing result, Almailabi et al [9], reported that there was no difference in the work-related quality of life between males and females which did not coincide with previous results. In a study by Somila et al [10], they relate residents' minor specialties, less than eight duty shifts/week to having a better quality of life while in a study by Bohrer et al [11], they estimated that restrictions to private life hierarchical and uncooperative working environment, lack of opportunities for continuing education and inadequate salary were the independent significant predictors of poor quality of life.

Moreover, we have learned that the increase in WRQoL score is correlated with the increase in the score JCS, CAW, GWB, HWI, and WCS but not with the SAW score wherein, an inverse correlation was observed between WRQoL score and SAW score, suggesting that an increase in the score of WRQoL is likely correlated with the decrease of SAW. In other words, a better work-related quality of life is directly associated with a decrease in the burden of stress at work.

### Job Career Satisfaction (JCS)

The mean score of JCS was 3.61 (SD 0.74) out of 5 points. Findings in this study suggest that 38.3% of the residents were

satisfied with their job careers, 31.9% were neutral and 29.8% were dissatisfied. Surprisingly, our results indicated that the JCS score was significantly better among smoking residents and the older age group residents ( $\geq 30$  years). In the USA [16], findings indicated that junior residents showed significantly better JCS scores than senior residents. In our study, we found no significant differences in the JCS score between each residency level which was not consistent with the previous results.

### General Well-Being (GWB)

There was satisfactory general well-being detected among the residents; nearly 40% were classified as having a high level of GWB, 31.9% were average and the rest were low (29.8%). The mean score of GWB was 3.21 (SD 0.51) out of 5 points. There was no relevant factor being found in regards to the socio-demographic characteristics of the residents. Consistent with our findings, Somila et al [10], reported satisfaction with residents' GWB, however, Almailabi et al [9], reported low GWB among surgical residents which opposed our results.

### Home-work Interface (HWI)

Similarly, 38.3% were considered as having a high level of HWI (mean score: 3.23; SD 0.79), and a higher level of HWI was significantly predicted among smoking residents but there was no difference in other socio-demographic variables including age and gender. In a study done Zubair et al [13], they found significant differences between HWI and gender where males exhibited better HWI than females.

### Control at work (CAW)

The mean score of CAW was 3.32 (SD 0.56) out of 5 points with 41.5% demonstrating a high level of CAW, 20.2% were average and 38.3% were low level. We also observed that increasing age was more associated with increasing CAW scores. Hence, this further indicates that better control at work can be shown among senior residents which were also reported by the American surgical residents [13].

### Working Conditions Satisfaction (WCS)

More than half (55.3%) reported having high satisfaction with working conditions, 10.6% were neutral and 34% had low WCS (mean score: 3.48; SD 0.73). No differences were found between WCS scores according to age group, gender, marital status, smoking, region of a residency program, and residency year level.

### Stress at Work (SAW)

Low stress at work was reported by 37.2% of the residents with a similar prevalence of average level (37.2%), however, approximately 25.5% still had a higher level of SAW (mean score 2.66; SD 0.89). In Thailand [10], medical residents' level of SAW was from average to low which was consistent with our reports.

## Conclusion

The work-related quality of life among otolaryngology, head, and neck surgical residents was adequate. Older residents demonstrated better quality of life than younger residents. Further, the improved quality of life signifies a decreased burden of stress at work, however, stress at work is likely the biggest contributor for male residents to smoke. Further research is needed to establish the work-related quality of life among residents in otolaryngology, head and neck surgery in our region.

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The manuscript has been read and approved for submission by all the authors listed above.

All authors believe the presented manuscript is representative of their work.

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