



Burnout in Turkish Adult Neurology Specialists

Türk Erişkin Nöroloji Uzmanlarında Tükenmişlik

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ABSTRACT

Aim: Burnout in medical doctors may worse affect patient care or physical performance of clinician. We aimed to investigate the burnout ratio and the factors associated with burnout in Turkish neurology specialists.

Materials and Methods: The neurology specialists in Turkey were included in the study. The participants were asked to fill a questionnaire comprised of 33 questions regarding various thoughts and experiences. The participants gave a response to the questions as follows: strongly disagree, slightly agree, moderately agree, strongly agree, completely agree. According to the meaning value of the question (negative or positive meaning), the answer was given a point in a range of 1-5. Sum of points divided by the maximum point (165) gave a burnout ratio.

Results: The mean age was 38.78 (± 8.42) years, and the female/male ratio was 461/255. The mean burnout ratio was found to be 46.73% (± 8.95). Male sex, academic membership, higher academic degree, working in medical faculty hospital, lower salary, being single or nonparent, nightshift, absence of on call work, or working in the intensive care unit were detected to be associated with a higher burnout ratio. Burnout ratio was in positive correlation with age, number of patients examined, and duration of working hours, but in negative correlation with number of auxiliary staff or neurologists in hospital.

Conclusion: Our study is the first study to demonstrate a high burnout ratio in a large sample of Turkish adult neurology specialists. Being male, older, academician, professor, single or nonparent, working in medical faculty hospital or in intensive care, low salary, nightshift, and high patient number or working hours seem to be associated with burnout.

Keywords: Burnout, neurology, Turkish, neurologist

ÖZ

Amaç: Tıp doktorlarında tükenmişlik hasta bakımını veya klinisyenin fiziksel performansını kötü etkileyebilir. Çalışmamızda Türk nöroloji uzmanlarındaki tükenmişlik oranını ve tükenmişlikle ilişkili faktörleri araştırmayı amaçladık.

Gereç ve Yöntem: Çalışmaya Türkiye'deki nöroloji uzmanları dahil edildi. Katılımcılardan çeşitli düşünce ve deneyimler ile ilişkili 33 sorudan oluşan bir anketi doldurmaları istendi. Katılımcılar sorulara şu şekilde cevap verdiler: Kesinlikle katılmıyorum, kısmen katılıyorum, katılıyorum, kuvvetle katılıyorum, kesinlikle katılıyorum. Sorunun anlamına göre (negatif veya pozitif), verilen cevap 1-5 arasında puanlandırıldı. Puanların toplamının maksimum (165) puana bölünmesiyle tükenmişlik oranı elde edildi.

Bulgular: Ortalama yaş 38,78 ($\pm 8,42$) yıl, kadın/erkek oranı 461/255 olarak bulundu. Ortalama tükenmişlik oranı %46,73 ($\pm 8,95$) idi. Erkek cinsiyet, akademisyenlik, akademik derecenin yüksek olması, tıp fakültesi hastanesinde çalışmak, düşük maaş, bekar olmak, ebeveyn olmamak, nöbet tutmak, icapçı olmamak veya yoğun bakım ünitesinde çalışmak daha yüksek tükenmişlik oranı ile ilişkili bulundu. Tükenmişlik oranı, yaş, muayene edilen hasta sayısı ve çalışma saatleri ile pozitif, yardımcı sağlık personeli veya nörolog sayısı ile negatif korelasyon içindeydi.

Sonuç: Bizim çalışmamız, Türk erişkin nöroloji uzmanlarından oluşan büyük bir örneklemede yüksek tükenmişlik oranını gösteren ilk çalışmadır. Erkek olmak, ileri yaş, akademisyen, profesör veya bekar olmak, ebeveyn olmamak, tıp fakültesi hastanesinde veya yoğun bakım ünitesinde çalışmak, düşük maaş, nöbet tutmak, yüksek hasta sayısı veya çalışma saati tükenmişlikle ilişkili görünmektedir.

Anahtar Kelimeler: Tükenmişlik, nöroloji, Türk, nörolog

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INTRODUCTION

Burnout in medical doctors may worse affect personal mental health, patient care, and may decrease physical performance of the clinician. Burnout might lead physicians to tend depressive episode and maybe suicidal behavior^{1,2}. Previous studies showed that burnout might affect more than a half of the physicians in the United States (US) or China^{3,4}. Medical neurologists were shown to have higher burnout rates and lower satisfaction rates, compared to many other medical specialties^{3,5,6}.

Burnout among neurologists was shown to be associated with low salary, low satisfaction with work-life balance and meaning in work, long clinical documentation, and violence^{3,7,8}.

In previous studies, burnout was observed at a high frequency among Turkish doctors working in emergency department⁹. Coronavirus disease-2019 (COVID-19) pandemics aggravated the burnout among Turkish medical doctors, especially working in emergency department, inpatient or outpatient clinics, or intensive care units^{10,11}. Besides difficulty in assessing personal protective equipment, working in COVID-19 care units, alone, was shown to be associated with burnout among physicians in Turkey^{10,11}. In a study, the prevalence of burnout during the pandemic was shown to be very high among neurology residents in Philippines¹².

In one study conducted before COVID-19 pandemic, violence was experienced by over 80% of the medical physicians in Turkey¹³. Violence in the health care units was suggested to be associated with burnout in that study¹³. However, burnout studies conducted among Turkish neurologists either before or during the pandemic are limited.

We hypothesized that workload, working hours, type of hospital, duration passed as specialist, working as an academic member, or salary problems might affect the job satisfaction or emergence of burnout in Turkish neurologists. We aimed to evaluate the burnout rate and the factors associated with burnout in Turkish adult neurology specialists.

MATERIALS AND METHODS

Study Design

This prospective observational study was conducted in Hacettepe University Hospital, and approved by the Local Ethics Committee of Hacettepe University with approval number, GO 18/898-05 (date: 25.09.2018). The study was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all of participants.

Study Population

The neurology specialists, so-called neurologists, participated in the study. In Turkey, to become a neurologist, neurology

specialty training for at least 5-years is to be completed after graduation from medical faculty. The participants were asked to fill a questionnaire, which was formed by the authors to evaluate burnout. The questionnaire was distributed physically to the neurology specialists working in state hospitals, training and research hospitals, and medical faculty hospitals throughout Turkey. We included most of these hospitals in our country, so that we might present a representative sample for Turkey. We performed this survey between November 2018 and January 2020.

The neurologists who were not willing to fill the questionnaire were excluded from the study. Moreover, incompletely filled questionnaire forms were also not included in the study.

Data Collection

Demographic parameters (age and sex), academic status (academic member or not), academic degree (specialist, associate professor, full professor), childbearing (parent or nonparent) of the participants were recorded. Type of hospital (state hospital, private hospital, training and research hospital, or medical faculty hospital) in which the participant was working, the duration of working in that institution as a neurology specialist, and features of job such as nightshift, off of work after nightshift, on call work, or working in intensive care unit were recorded. The mean daily number of patients that the participant examined, the number of auxiliary staff, the number of neurologists in the hospital, and the mean duration of working hours were also recorded.

Evaluation of Burnout

We performed a questionnaire to evaluate the degree of burnout in the participants. We prepared the questionnaire by 33 questions regarding various thoughts and experiences. The participants gave a response to the questions as follows: strongly disagree, slightly agree, moderately agree, strongly agree, completely agree. The answers were evaluated with a range of 1-5 points. According to the meaning value of the question (negative or positive meaning), the answer was given a point. Sum of points divided by the maximum point (165) gave a burnout ratio.

Statistical Analysis

Data obtained in the study were analyzed statistically using Statistical Package for the Social Sciences 27.0 software (IBM Corporation, Armonk, New York, US). The conformity of the data to normal distribution was evaluated using the Shapiro-Wilk Francia test. When comparing more than two independent groups according to quantitative variables, the Kruskal-Wallis H test with Monte Carlo simulation was used with Dunn's test for post hoc analysis. When comparing two independent

groups according to quantitative variables, the Mann-Whitney U test with Monte Carlo simulation was used. To analyze the correlations among the variables, the Spearman's Rho test was employed. To reveal the causality between dependent and independent variables as a mathematical model, one of Ensemble Machine Learning methods, Boosting/Bagging linear regression analyses were used. To increase the predictive value, Automatic Data Preparation steps (include: Adjustment of measurement level, Outlier and missing value handling, Supervised merging, Outlier and missing value handling and supervised merging) were performed. As a model selection method, information criterion (AICC) method in Best subsets/ Forward stepwise method was used. Because high-accuracy results could not be achieved, we did not report it. Quantitative variables were stated as mean (standard deviation), median (minimum-maximum), and median (1st quartile-3rd quartile) values, and categorical variables as number (n) and percentage (%) on the tables. Variables were evaluated at a 95% confidence level, and a value of $p < 0.05$ was accepted as statistically significant.

RESULTS

The mean age of the participants was 38.78 (± 8.42) years. The female/male ratio was 461/255. 80% of whole participants were not academic member, and monthly salary was higher than 50000 Turkish Liras in 30.3%. The mean burnout ratio was 46.73% (± 8.95), the mean working hour was 9.02 (± 3.30) hours, and the mean daily number of patients examined was 40 (5-120) (Table 1).

Number of responses to each item in the questionnaire was demonstrated on Table 2.

Male sex, academic membership, higher academic degree, work in medical faculty hospital, lower salary, being single or nonparent, nightshift, absence of on call work, or intensive care unit work were associated with a higher burnout ratio. Burnout ratio was in positive correlation with age, number of patients examined, and duration of working hours, but in negative correlation with number of auxiliary staff or number of neurologists in hospital (Table 3).

DISCUSSION

We found that being male, older, academician, professor, single or nonparent, working in medical faculty hospital or in intensive care, low salary, nightshift, high patient number or working hours were associated with higher burnout ratio.

In one study conducted among US neurology residents and fellows, greater satisfaction with work-life balance, meaning in work, or older age were associated with less burnout³. To evaluate the impact of age on burnout, it is more accurate to evaluate it in a wide range of age, and in a group of clinicians

both with low and high experience. We found that older age was associated with more burnout, but we included neurology specialists comprising of both new specialists and professors. A large study conducted in US including both specialists and residents revealed that working hours, number of patients, on call work and clerical work were associated with high risk for burnout¹⁴. However, they showed that age was associated with lower risk of burnout. Discrepancies in the association of age with burnout risk might be explained by discrepancies in job conditions and satisfaction which might be affected by national policies. We found that the mean duration passed as neurology specialist was not correlated with burnout ratio. Being academic member or full professor, salary, marital status, or on call work might affect burnout. We suggest that age might be a complex factor interacting with all these factors which have an impact on burnout ratio.

Gender discrepancies have been investigated in a number of studies analyzing burnout in neurologists^{15,16}. In a large study analyzed in Chinese neurologists, female neurologists were found as younger, less married or to have children, less to hold senior role, but working hours and on call work did not differ according to sex¹⁵. Multivariate analysis showed that risk factors for burnout were similar in men and women. A previous survey of US neurologists revealed that female neurologists made more negative comments regarding workload, although working hours, on call work, or patient volume were independent of sex¹⁶. In our study, female preponderance was observed (female/male ratio: 1.8) in contrast to the previous studies^{14,16}. We showed that male sex was associated with higher burnout ratio but we did not examine the sex differences in academic or job properties. Discrepancies in salary or representation as an academic member were found to be an important factor for attrition of women from neurology in US⁷. We found that being a parent decreased the burnout ratio. An online survey analyzing women neurologists in US showed that self-reported gender discrimination or having more children was associated with burnout and dissatisfaction¹⁷. Among Japanese neurologists, it was found that working hours was higher in men, but housework load was higher among women neurologists¹⁸. We observed that career dissatisfaction was high among Turkish neurologists according to the statements in the questionnaire.

We found that working hours might increase burnout ratio. We did not specifically examine the actual cause of working hours, such as clerical work, but high patient number probably might increase it. In previous studies, clerical workload and patient number were found to be associated with higher working hours, poor work-life balance, and higher burnout risk^{14,16,19}. We also revealed that low number of auxiliary staff or neurologists might increase burnout ratio. The absence of adequate co-existent staff may increase both clerical work,

Table 1. Demographic and job properties of the participants		
		n (%)
Sex		
	Male	255 (35.6)
	Female	461 (64.4)
Academic status		
	Academic member	143 (20.0)
	Not academic member	573 (80.0)
Academic degree		
	Specialist	622 (86.9)
	Associate professor	60 (8.4)
	Full professor	34 (4.7)
Hospital		
	State hospital	262 (36.6)
	Private hospital	159 (22.2)
	Training and research hospital	140 (19.6)
	Medical faculty hospital	155 (21.6)
Monthly salary*		
	<7500 TL	46 (6.4)
	7500-12500 TL	453 (63.3)
	12500-20000 TL	185 (25.8)
	>20000 TL	32 (4.5)
Marital status (married)		521 (72.8)
Childbearing (parent)		461 (64.4)
Nightshift (present)		328 (45.8)
Off of work after nightshift (present)		100 (14.0)
On call work (present)		478 (66.8)
Intensive care unit work (present)		539 (75.3)
	Mean (SD)	Median (min-max)
Age (year)	38.78 (8.42)	38 (25-65)
Burnout ratio	46.73 (8.95)	46.67 (27.88-76.36)
Mean daily number of patients examined	47.99 (29.78)	40 (5-120)
Duration passed as specialist (year)	10.45 (7.04)	9 (1-35)
Number of auxiliary staff	2.61 (1.22)	2 (1-5)
Number of neurologists in hospital	6.17 (6.31)	4 (1-30)
Duration of working hours	9.02 (3.30)	8 (5-36)
*Refers to salaries between the years of 2018 and 2020. TL: Turkish Liras, SD: Standard deviation, min-max: Minimum-maximum		

patient number, working hours, or frequency of nightshift, which might contribute to increased burnout risk. Inadequate staff was also demonstrated to be associated with burnout in previous studies^{3,16}. The factors associated with burnout, which have been investigated both in the present and the previous studies, seem not to be independent of each other^{14,16,19}. We thought that increased working hours might also be associated with documentation work but we did not analyze it. Documentation work or time requirement for documentation

was shown as an important problem for burnout in a previous study¹⁷.

The daily number of patients was ranged in 5-120 in the present study. This broad range might be resulted from the inclusion of various types of hospitals, and from the inclusion of both academic members and specialists. Upper limit of the range was extremely high for a neurologist to examine such many patients in one day. The annual number of patients examined was also shown to be high in a burnout study investigated in

Table 2. Response of the participants to the questionnaire					
	Strongly disagree	Slightly agree	Moderately agree	Strongly agree	Completely agree
The neurologists' workload is heavy.	5 (0.7)	0 (0.0)	23 (3.2)	122 (17.0)	566 (79.1)
Salary payments are delayed.	269 (37.6)	158 (22.1)	171 (23.9)	66 (9.2)	52 (7.3)
Interpersonal disharmony affects the decision to collaborate.	8 (1.1)	8 (1.1)	98 (13.7)	256 (35.8)	346 (48.3)
Healthcare workers are exposed to violence in hospitals.	0 (0.0)	5 (0.7)	42 (5.9)	224 (31.3)	445 (62.2)
The healthcare workers are verbally insulted.	0 (0.0)	5 (0.7)	58 (8.1)	168 (23.5)	485 (67.7)
I often worry about being reported.	21 (2.9)	45 (6.3)	236 (33.0)	143 (20.0)	271 (37.8)
I believe that professional organizations adequately represent neurologists.	293 (40.9)	156 (21.8)	120 (16.8)	59 (8.2)	88 (12.3)
Not doing extra work is a problem for me.	106 (14.8)	99 (13.8)	197 (27.5)	142 (19.8)	172 (24.0)
My patients' knowledge of neurology is insufficient.	0 (0.0)	10 (1.4)	120 (16.8)	323 (45.1)	263 (36.7)
I believe that the news in the media has negatively affected my relationships with my patients.	0 (0.0)	12 (1.7)	82 (11.5)	280 (39.1)	342 (47.8)
I am disturbed because of having to take care of the patient who creates trouble for me.	6 (0.8)	18 (2.5)	44 (6.1)	104 (14.5)	544 (76.0)
Bureaucratic work prevents me from sparing enough time for patients.	0 (0.0)	20 (2.8)	120 (16.8)	198 (27.7)	378 (52.8)
Off-label report and medication requests bother me.	6 (0.8)	12 (1.7)	52 (7.3)	110 (15.4)	536 (74.9)
There are problems regarding taking leave.	40 (5.6)	94 (13.1)	214 (29.9)	152 (21.2)	216 (30.2)
I believe that the clinical practice training I have received is adequate.	36 (5.0)	36 (5.0)	209 (29.2)	358 (50.0)	77 (10.8)
Neurologists' job satisfaction is taken into account.	400 (55.9)	175 (24.4)	50 (7.0)	4 (0.6)	87 (12.2)
Neurologists' patients respect them.	81 (11.3)	159 (22.2)	303 (42.3)	169 (23.6)	4 (0.6)
The duties and authorities of the director neurologists are determined.	201 (28.1)	197 (27.5)	245 (34.2)	57 (8.0)	16 (2.2)
I should be able to electronically review the tests performed in other hospitals.	8 (1.1)	4 (0.6)	20 (2.8)	72 (10.1)	612 (85.5)
I can spare enough time for my registered patients.	207 (28.9)	172 (24.0)	196 (27.4)	127 (17.7)	14 (2.0)
I take extra time at the outpatient clinic and take care of patients who are waiting.	42 (5.9)	62 (8.7)	155 (21.6)	266 (37.2)	191 (26.7)
I can spare enough time for my vocational training.	272 (38.0)	201 (28.1)	162 (22.6)	73 (10.2)	8 (1.1)
I believe that my patients trust me.	28 (3.9)	44 (6.1)	121 (16.9)	415 (58.0)	108 (15.1)
In terms of my neurology career, I anticipate a promising future.	293 (40.9)	134 (18.7)	137 (19.1)	118 (16.5)	34 (4.7)
Neurologists work in harmony with the Turkish Neurological Society.	154 (21.5)	241 (33.7)	210 (29.3)	82 (11.5)	29 (4.1)
I am satisfied with the performance system.	602 (84.1)	72 (10.1)	34 (4.7)	8 (1.1)	0 (0.0)
If I was given another chance, I would like to be a neurologist again.	270 (37.7)	72 (10.1)	161 (22.5)	102 (14.2)	111 (15.5)
I would like my child to become a doctor.	449 (62.7)	124 (17.3)	62 (8.7)	38 (5.3)	43 (6.0)
I would like my child to become a neurologist.	517 (72.2)	82 (11.5)	78 (10.9)	20 (2.8)	19 (2.7)
I can spare the time for myself.	341 (47.6)	218 (30.4)	127 (17.7)	16 (2.2)	14 (2.0)
At work, I have the opportunity to express myself and am assigned duties that match my abilities.	215 (30.0)	169 (23.6)	169 (23.6)	128 (17.9)	35 (4.9)
My superiors do not expose me to physical, verbal or implied mistreatment of my rights in the workplace.	104 (14.5)	146 (20.4)	235 (32.8)	154 (21.5)	77 (10.8)
The institution for which I work pays me the income I deserve as a result of my overtime work (extra payment/ progress payment) without any deductions.	241 (33.7)	190 (26.5)	139 (19.4)	104 (14.5)	42 (5.9)

Table 3. Association of burnout ratio with demographic and job properties of the participants					
		n		Burnout ratio Median (q1-q3)	p
Sex					0.002^u
	Male	255		47.27 (41.21-55.76)	
	Female	461		46.06 (39.39-52.73)	
Academic status					<0.001^u
	Academic member	143		51.52 (47.27-56.36)	
	Not academic member	573		45.45 (38.79-52.12)	
Academic degree					<0.001^k
	Specialist	622	A	45.45 (39.39-52.12) ^{A, B}	
	Associate professor	60	B	52.12 (47.27-56.36)	
	Full professor	34	C	53.94 (51.52-56.36)	
Hospital					<0.001^u
	State hospital	262	A	44.85 (39.39-47.88)	
	Private hospital	159	B	46.67 (38.18-54.55)	
	Training and research hospital	140	C	46.36 (40.61-52.12)	
	Medical faculty hospital	155	D	53.33 (49.09-56.36) ^{A, B, C}	
Monthly salary					<0.001^k
	<30000 TL	46	A	50.91 (37.58-61.82)	
	30000-50000 TL	453	B	45.45 (39.39-52.73) ^C	
	50000-80000 TL	185	C	49.09 (46.06-55.15)	
	>80000 TL	32	D	39.39 (37.58-43.94) ^{A, B, C}	
Marital status					<0.001^u
	Married	521		45.45 (39.39-52.73)	
	Single	195		50.3 (44.85-54.55)	
Childbearing					<0.001^u
	Parent	461		44.24 (38.18-52.12)	
	Nonparent	255		49.7 (45.45-55.15)	
Nightshift					0.001^u
	Present	328		47.27 (41.21-55.15)	
	Absent	388		45.45 (38.79-52.73)	
Off of work after nightshift					0.402 ^u
	Present	100		46.66 (40-52.73)	
	Absent	616		46.67 (39.39-53.94)	
On call work					0.004^u
	Present	478		46.06 (39.39-52.12)	
	Absent	238		48.785 (39.39-55.15)	
Intensive care unit work					0.002^u
	Present	539		49.09 (43.64-56.36)	
	Absent	177		46.06 (39.39-52.73)	
				r	
Mean daily number of patients examined		716		0.272	<0.001^s
Duration passed as specialist (year)		716		-0.062	0.097 ^s
Number of auxiliary staff		716		-0.170	<0.001^s
Number of neurologists in hospital		716		-0.233	<0.001^s
Age (year)		716		0.074	0.048^s
Duration of working hours		716		0.182	<0.001^s
Monthly salary		716		0.064	0.085 ^s

^uMann-Whitney U test (Monte Carlo), ^kKruskal Wallis Test (Monte Carlo); post-hoc test: Dunn's test, ^sSpearman's rho test, r: Correlation coefficient, q1: 1st Quartile, q3: 3rd Quartile, ^{A, B, C, D}Expresses significance according to relevant subgroups

China⁴. The relationship of patient number with burnout among neurologists was also suggested in that study. Working in public hospital was also found as a risk for burnout⁴. According to our findings, working in a medical faculty hospital seems to be associated with a higher burnout ratio than working in a state hospital or training and research hospital. This discrepancy might be related to that salary, working hours, or patient numbers might differ among these hospitals in Turkey. Our study is the first study to analyze burnout ratio in a large sample of Turkish adult neurology specialists. We revealed that nightshift, rather than on call work, was associated with higher burnout ratio. However, on call work seems to be a risk factor for burnout among neurologists in another country⁴. This also might be resulted from different policies applied for health care workers. In our study, off of work after nightshift did not affect the burnout ratio. To our knowledge, no previous studies include such a parameter. The explanation might be that off of work after nightshift might be a routine procedure in other countries.

We showed that monthly salary of >80000 Turkish Liras was associated with lower burnout ratios. However, minority of Turkish neurologists have earned such a salary. Lower income was shown as an important factor for burnout among neurologists also in other countries, such as China or US^{4,7}. Neurologists were shown to earn one of the least salaries among medical specialties in US⁷. Actually, we thought that evaluation of purchase power for a neurologist might have a higher importance to compare Turkish neurologists with those in other countries. However, it necessitates a different design of study.

In one study investigating burnout among neurology residents during the COVID-19 pandemic, burnout frequency was found as extremely high (94%)¹². We analyzed burnout among neurology specialists independent of COVID-19 pandemic.

Study Limitations

We analyzed only neurology specialists including both academic members and non-members, and excluded residents. To our knowledge, off of work after nightshift is the first time analyzed as a parameter that may affect burnout ratio among neurologists. Our analysis was performed independent of COVID-19 pandemic.

CONCLUSION

We found a high burnout ratio among women and men neurology specialists, and that being male, older, academician, professor, single or nonparent, working in medical faculty hospital or in intensive care, low salary, nightshift, high patient number or working hours were associated with higher

burnout ratio. Burnout ratio is affected by a number of factors interacting each other, and considering the impact of burnout both on the neurologist and the patient health, national policies become important to prevent or decrease these factors in this population.

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Ethics

Ethics Committee Approval: This prospective observational study was conducted in Hacettepe University Hospital, and approved by the Local Ethics Committee of Hacettepe University with approval number, GO 18/898-05 (date: 25.09.2018).

Informed Consent: Written informed consent was obtained from all of participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: H.A.U., F.G.Y.S., Design: A.O.K., H.G., H.A.U., F.G.Y.S., Data Collection or Processing: A.O.K., H.G., Analysis or Interpretation: A.O.K., H.G., H.A.U., F.G.Y.S., Literature Search: A.O.K., H.G., H.A.U., F.G.Y.S., Writing: A.O.K., H.G., H.A.U., F.G.Y.S.

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