



Impact of mobilization of residents in otolaryngology-head–neck surgery in COVID-19 units on mental health status

Jerome R. Lechien^{1,2,3,4,5} · Emilien Chebib^{4,5} · Karol Zelenik^{5,6} · Antonino Maniaci^{5,7,8} · Gabriele Molteni^{5,9} · Juan M. Maza-Solano^{5,10} · Stéphane Hans⁵

Received: 14 January 2022 / Accepted: 14 August 2022

© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2022

Abstract

Background To investigate mental health, sleep, and addiction features of young otolaryngologists (YO) according to the mobilization in COVID-19 units at the end of the third European wave of infections.

Methods A cross-sectional survey was sent to 220 YO of 6 European University hospitals. The following outcomes were evaluated: postgraduate year; age; management of COVID-19 patients; workload; nights on call; stress; Beck depression inventory; Insomnia severity index; sleep and mental health status evolutions throughout pandemic; consumption of alcohol, tobacco, and drugs before and during pandemic.

Results A total of 128 YO completed the evaluations (58.2%). Twenty responders (15.6%) did not manage COVID-19 patients, while 65 (50.8%), 20 (15.6%), and 23 (18%) managed rarely, frequently or daily COVID-19 patients during the pandemic, respectively. The management of COVID-19 patients was associated with increases of workload ($p=0.023$) and number of nights on-call ($p<0.001$). At the end of the third wave, the depression rates were 34% ($N=31/68$) and 57% ($N=34/60$) in YO who worked less and more than 50 h weekly, respectively. Sleep disturbance concerned 39% ($N=26/66$) and 55% ($N=27/60$) of YO who worked less and more than 50 h weekly, respectively. Mobilized YO reported a significant increase of alcohol consumption compared with control group ($p=0.002$). Tobacco and drugs consumptions did not evolve. The consumption of alcohol was positively correlated with the number of nights on-call ($p=0.036$) and the total hours of work ($p=0.009$).

Conclusions Young otolaryngologists (YO) mobilized in COVID-19 units reported higher hours worked, nights on call, and alcohol consumption compared with others. Future large cohort-studies are needed to confirm our observations.

Keywords COVID-19 · SARS-CoV-2 · Residents · Fellow · Addiction · Alcohol · Recruitment · Depression · Sleep · Otolaryngology

✉ Jerome R. Lechien
Jerome.Lechien@umons.ac.be

¹ Department of Otolaryngology, Elsan Hospital, Paris, France

² Department of Human Anatomy and Experimental Oncology, Faculty of Medicine, UMONS Research Institute for Health Sciences and Technology, University of Mons (UMons), Avenue du Champ de mars, 6, 7000 Mons, Belgium

³ Department of Otolaryngology-Head Neck Surgery, CHU de Bruxelles, CHU Saint-Pierre, Brussels, Belgium

⁴ Department of Otolaryngology-Head Neck Surgery, Foch Hospital, School of Medicine, UFR Simone Veil, Université Versailles Saint-Quentin-en-Yvelines (Paris Saclay University), Paris, France

⁵ COVID-19 Task Force of Young Otolaryngologists of International Federation of Otorhinolaryngological Societies (YO-IFOS), Paris, France

⁶ Department of Otorhinolaryngology and Head and Neck Surgery, Faculty of Medicine, University Hospital of Ostrava, Ostrava, Czech Republic

⁷ Department of Medical and Surgical Sciences and Advanced Technologies “GF Ingrassia”, ENT Section, ENT Department of University of Catania, Catania, Italy

⁸ Department of Biomedical and Biotechnological Sciences (BIOMETEC), University of Catania, Catania, Italy

⁹ Division of Otolaryngology-Head and Neck Surgery, University Hospital of Verona, Verona, Italy

¹⁰ Department of Otolaryngology, Hospital Universitario Virgen Macarena, Seville, Spain

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has mobilized an important part of the worldwide medical workforce. In many regions, the overwork and the limited medical workforce led some medical centers to mobilize some physicians who do not commonly work in emergency or intensive care units. This situation particularly occurred in some European hospitals in which young otolaryngologists were mobilized in COVID-19 units. In this short communication, we investigated mental health, sleep, and addiction features of young otolaryngologists according to the mobilization in COVID-19 units at the end of the third European wave of infections.

Methods

From March 10, 2020 to June 30, 2021, 220 residents and fellows of 6 European University hospitals were invited to complete an online survey through Professional Survey Monkey® (San Mateo, California, USA). The selected hospitals were located in area with high prevalence of

COVID-19 cases, including hospitals of Paris (Foch, AP-HP hospitals, France), Brussels (CHU Saint-Pierre, Belgium), Sevilla (Hospital Universitario Virgen Macarena, Spain), Ostrava (University Hospital of Ostrava, Czech Republic), Verona and Catania (University hospitals of Verona and Catania, Italy). The following outcomes were evaluated: postgraduate year; age; management of COVID-19 patients; workload and evolution throughout the pandemic; nights on call; evolution of stress; Beck depression inventory [1]; Insomnia severity index [2]; evolution of sleep and mental health status throughout pandemic; consumption of alcohol, tobacco, and drugs before and during pandemic. Beck depression inventory is a 21-item patient-reported questionnaire defining depression on a maximum score of 33. When the score is > 3, the depression is highly suspected [1]. Insomnia severity index is 7-item score ranging from 0 to 28. A score > 7 is suggestive of sleep disturbance [2].

Depending on the data distribution, statistical analyses were performed according to the mobilization of otolaryngologists in COVID-19 units (no mobilization; rare (< 2 d/w), frequent (3–4 d/w), or full-mobilization (> 4 d/w)) using the following tests: Chi-square; Kruskal–Wallis

Table 1 Cohort features

Outcomes	Management/mobilization in COVID-19 Units				
	None (N=20)	Rare (N=65)	Frequent (N=20)	Daily (N=23)	N tot (%)
PGY-1	6 (30)	11 (17)	5 (25)	5 (22)	27 (21)
PGY-2	4 (20)	11 (17)	4 (20)	3 (13)	22 (17)
PGY-3	1 (5)	6 (9)	2 (10)	1 (4)	10 (8)
PGY-4	3 (15)	16 (25)	3 (15)	4 (17)	26 (20)
PGY-5–7	3 (15)	5 (7)	2 (10)	1 (4)	11 (9)
Fellows	3 (15)	16 (25)	4 (20)	9 (39)	32 (25)
Age					
20–30	15 (75)	47 (72)	13 (65)	12 (52)	87 (68)
30–35	4 (20)	10 (15)	4 (20)	7 (30)	25 (20)
35–45	1 (5)	8 (13)	3 (15)	4 (18)	16 (12)
Workload (hours/week)					
< 30	2 (10)	2 (3)	0 (0)	0 (0)	4 (3)*
31–50	9 (45)	27 (42)	10 (50)	9 (39)	55 (43)*
51–70	8 (40)	34 (52)	8 (40)	11 (48)	61 (48)*
> 71	1 (5)	2 (3)	2 (10)	3 (13)	8 (6)*
Infection by COVID-19 (N, %)	5 (25)	13 (20)	3 (15)	7 (30)	28 (22)
Nights on call (N/m)					
None	9 (45)	15 (23)	3 (15)	2 (9)	29 (23)**
1–2	6 (30)	7 (12)	2 (10)	3 (13)	18 (14)**
3–4	4 (20)	22 (34)	4 (20)	7 (30)	37 (29)**
> 4	1 (5)	20 (31)	11 (55)	11 (48)	43 (34)**

COVID-19 coronavirus disease 2019, PGY postgraduate year

* $p=0.015$; ** $p<0.001$ (Chi-square)

and ANOVA. The mobilization of otolaryngologists consisted of intensive care unit or medical units of COVID-19 patients. The ethic committee agreement was not required for this cross-sectional study (Foch Hospital, Paris, France).

Results

From the 220 invited young otolaryngologists, 128 completed the evaluations (58.2%) accounting for 95 and 33 residents and fellows, respectively. Twenty responders (15.6%) did not manage COVID-19 patients, while 65 (50.8%), 20 (15.6%), and 23 (18%) managed rarely, frequently or daily COVID-19 patients during the pandemic, respectively. The features of cohort are described in Table 1. The management of COVID-19 patients was significantly associated with an increase of workload in term of number of hours per week ($p=0.023$; Fig. 1A). Similar findings were observed regarding the number of nights on call monthly ($p < 0.001$; Table 1). Otolaryngologists

who worked in COVID-19 units felt more stressed at most they were involved in the COVID-19 unit work ($p=0.001$; Fig. 1B). The depression, sleep, and addiction findings are reported in Table 2. At the end of the third wave, the depression rates were 34% ($N=31/68$) and 57% ($N=34/60$) in YO who worked less and more than 50 h weekly, respectively. Sleep disturbance concerned 39% ($N=26/66$) and 55% ($N=27/49$ responders) of YO who worked less and more than 50 h weekly, respectively. The evolution of mental health status throughout the pandemic is described in Fig. 1C. The proportion of otolaryngologists who recognized having a significant deterioration of mental health status during the pandemic was significantly higher in COVID-19 groups compared with those who did not work in COVID-19 units ($p=0.031$).

The alcohol consumption findings are described in Table 2. There were no significant differences between group regarding the quantity of alcohol consumed per week (IU/w) at the end of the pandemic. However, the pre-to-post-pandemic increase of alcohol consumption concerned 14% of otolaryngologists who did not manage

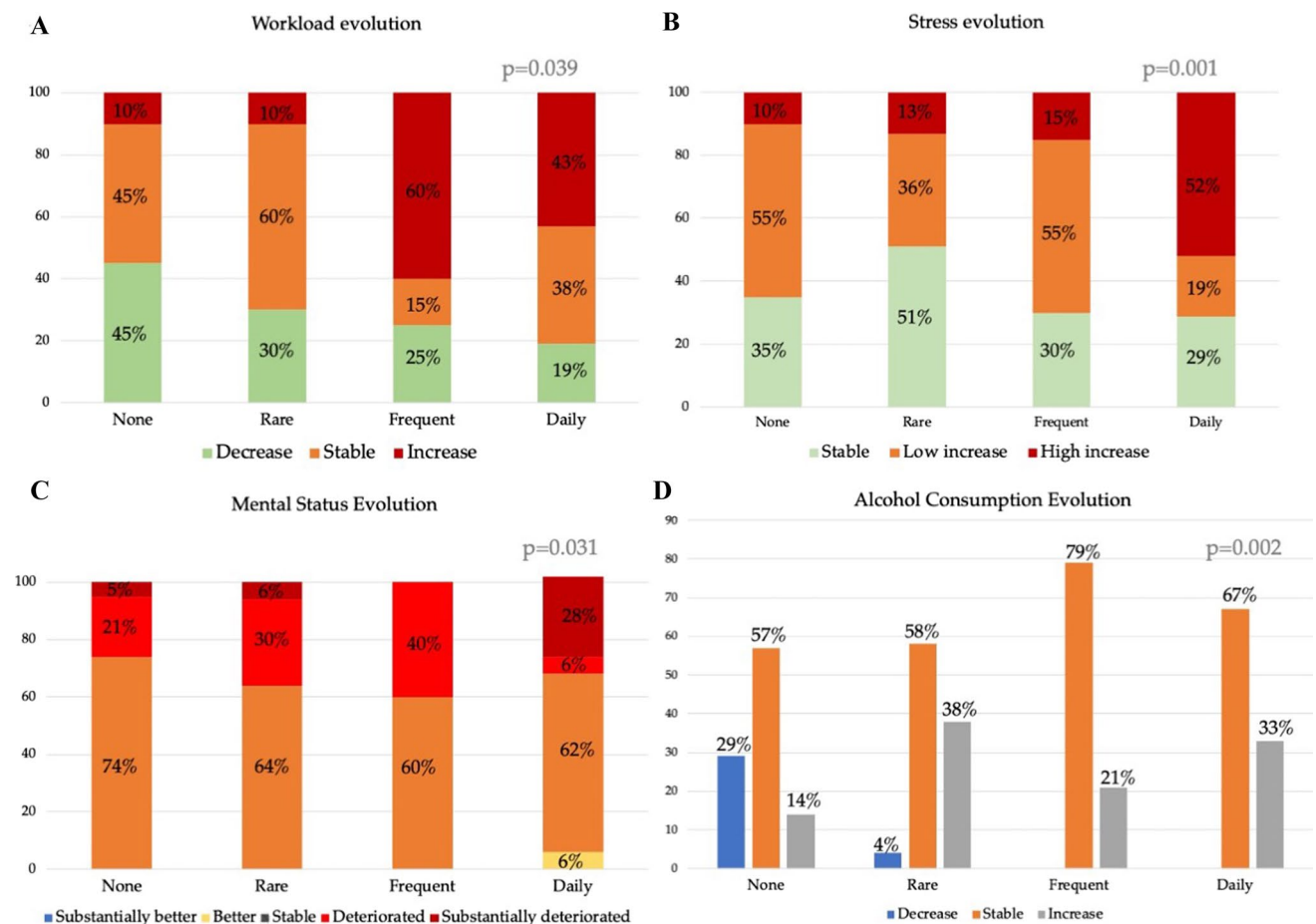


Fig. 1 Workload, stress, mental health and alcohol consumption. Workload (A) and stress (B) increases, and mental health (C) and alcohol consumption (D) deterioration were significantly higher in physicians of COVID-19 units

COVID-19 patients, while 38, 21, and 33% of those who worked in COVID-19 units reported having increased their alcohol consumption during the pandemic ($p = 0.002$; Fig. 1D). The following alcohols were consumed: beer ($N = 61$), wine ($N = 52$), and spirits ($N = 31$). Twenty-one responders (16.4%) smoked and, among them, 3 (3%) stopped at the end of the pandemic. No smoker started or increased the cigarette during/after the pandemic.

There was significant positive association between Beck inventory scale and sleep scores ($r_s = 0.5$; $p < 0.001$) and between Beck inventory scale score and the consumption of alcohol (IU/w; $r_s = 0.4$; $p = 0.002$). The consumption of alcohol glasses (IU/w) was positively correlated with the number of nights on call ($r_s = 0.2$; $p = 0.036$) and the total hours of work ($r_s = 0.2$; $p = 0.009$). The association study reported an influence of otolaryngologist training on sleep score. Precisely, postgraduate had a significant lower (better) sleep score (8.7 ± 4.7) than fellows (11.2 ± 5.9 ; $p = 0.041$) (Fig. 2).

Discussion

One year ago, Vallée et al. reported that symptoms of anxiety, depression and insomnia were present in 36% of French residents and fellows in general surgery during the pandemic, leading to an increase of consumption of both alcohol or tobacco [3]. In the present study, the prevalence of depression and insomnia symptoms reached more than 40% of cases and was associated with the number of hours (workload), which corroborates the high prevalence of the French study [3]. These prevalence data are substantially higher than those commonly reported in the literature, which ranged from 5% to up to 28% in non-pandemic periods [4, 5]. In a recent American cross-sectional survey, professional burnout and depressive disorder were identified in 35% and 5% of trainees with hours worked, and nights on call as predictive factors [4]. The negative impact of COVID-19 pandemic on mental health of otolaryngologists was investigated in two recent studies [6, 7], which reported higher prevalence of

Table 2 Depression, sleep and alcohol features of otolaryngologist groups

Outcomes	Management/mobilization in COVID-19 Units				
	None ($N = 20$)	Rare ($N = 65$)	Frequent ($N = 20$)	Daily ($N = 23$)	N tot (%)
Beck depression inventory (/33)					
Mean score (SD)	3.9 ± 2.5	4.6 ± 4.8	4.1 ± 3.9	3.4 ± 3.8	4.2 ± 4.2
No depression (<4)	9 (45)	28 (43)	12 (60)	12 (53)	61 (48)
Mild depression (4–7)	9 (45)	16 (25)	4 (20)	4 (17)	33 (26)
Moderate depression (8–15)	1 (5)	11 (16)	4 (20)	3 (13)	19 (15)
Severe depression (> 15)	0 (0)	3 (5)	0 (0)	0 (0)	3 (2)
No response	1 (5)	7 (11)	0 (0)	4 (17)	12 (9)
Insomnia Scale Score (/28)					
Mean score (SD)	4.2 ± 3.8	5.8 ± 5.3	7.0 ± 5.4	6.4 ± 4.9	5.8 ± 5.0
No insomnia (<8)	11 (55)	30 (46)	11 (55)	9 (39)	61 (48)
Mild insomnia (8–14)	7 (35)	18 (28)	4 (20)	5 (22)	34 (26)
Moderate insomnia (15–21)	1 (5)	7 (11)	2 (10)	5 (22)	15 (12)
Severe insomnia (22–28)	0 (0)	2 (3)	0 (0)	0 (0)	2 (2)
No response	1 (5)	8 (12)	3 (15)	4 (17)	16 (12)
Alcohol consumption					
No consumption	7 (35)	28 (43)	4 (20)	4 (17)	43 (34)
Consumption before mobilization	12 (60)	33 (51)	16 (80)	17 (75)	78 (61)
Consumption since mobilization	0 (0)	2 (3)	0 (0)	1 (4)	3 (2)
Stopped since mobilization	1 (5)	2 (3)	0 (0)	1 (4)	4 (3)
Quantity (IU/w)					
None	7 (35)	28 (43)	4 (20)	4 (17)	43 (33)
1–2 IU/w	0 (0)	2 (3)	0 (0)	2 (9)	4 (3)
3–4 IU/w	6 (30)	12 (18)	4 (20)	5 (22)	27 (21)
5–10 IU/w	2 (10)	9 (14)	7 (35)	2 (9)	20 (16)
11–20 IU/w	2 (10)	7 (11)	4 (20)	2 (9)	15 (12)
> 20 IU/w	0 (0)	1 (2)	1 (5)	2 (9)	4 (3)
No response	3 (15)	6 (9)	0 (0)	6 (25)	15 (12)

COVID-19 coronavirus disease 2019, IU international unit, w week

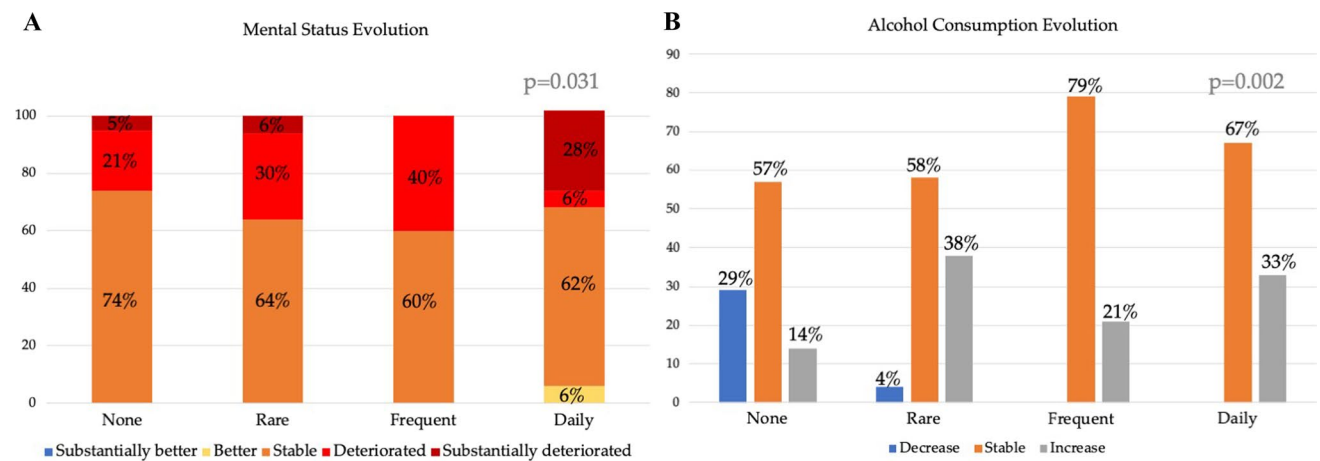


Fig. 2 Mental status and alcohol evolution throughout pandemic

distress, depression and burnout in period of pandemic, ranging from 10.6 to 75.2% of surveyed participants. Interestingly, Ashoor et al. identified that residents in otolaryngology reported higher negative psychological impact of pandemic compared with board certified physicians [7]. Others reported that female gender, high number of hours worked and nights on call negatively impact the mental health status of resident and fellows in pandemic period [6, 7].

Conclusions

The originality of this report is the observation of significant relationships between number of hours worked, nights on call, and alcohol consumption in young otolaryngologists mobilized in COVID-19 units. Future studies are needed to confirm our observation, addressing the need to support psychologically residents and fellows involved in the COVID-19 patient cares.

Funding No.

Declarations

Conflict of interest Authors have no conflict of interest.

Research involving human participants and/or animals IRB was not required for this study.

Informed consent Participants agreed to participate.

References

1. Freeston MH, Ladouceur R, Thibodeau N, Gagnon F, Rhéaume J (1994) The beck anxiety inventory. Psychometric properties of a French translation. *Encephale*. 20(1):47–55
2. Bastien CH, Vallières A, Morin CM (2001) Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med* 2(4):297–307. [https://doi.org/10.1016/s1389-9457\(00\)00065-4](https://doi.org/10.1016/s1389-9457(00)00065-4)
3. Vallée M, Kutchukian S, Pradère B, Verdier E, Durbant È, Ramlugun D, Weizman I et al (2020) Prospective and observational study of COVID-19's impact on mental health and training of young surgeons in France. *Br J Surg* 107(11):e486–e488. <https://doi.org/10.1002/bjs.11947>
4. Larson DP, Carlson ML, Lohse CM, O'Brien EK, Kircher ML, Gurgel RK et al (2021) Prevalence of and associations with distress and professional burnout among otolaryngologists: part I, trainees. *Otolaryngol Head Neck Surg* 164(5):1019–1029. <https://doi.org/10.1177/0194599820959273>
5. Kligerman MP, Devine EE, Bentzley JP, Megwalu UC (2021) Cost-effectiveness of depression screening for otolaryngology-head and neck surgery residents. *Laryngoscope* 131(3):502–508. <https://doi.org/10.1002/lary.28780>
6. Civantos AM, Byrnes Y, Chang C, Prasad A, Chorath K, Poonia SK et al (2020) Mental health among otolaryngology resident and attending physicians during the COVID-19 pandemic: national study. *Head Neck* 42(7):1597–1609. <https://doi.org/10.1002/hed.26292>
7. Ashoor MM, Almulhem NJ, AIMubarak ZA, Alrahim AA, Alshammari SM, Alzahrani FS, Alhayek AR, Alardhi A (2021) The psychological impact of the COVID-19 pandemic on otolaryngologists: should we be concerned? *Laryngoscope Investig Otolaryngol* 6(3):576–585. <https://doi.org/10.1002/lio2.556>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.