

# Stress and Anxiety of Otorhinolaryngology Healthcare Workers During the COVID-19 Pandemic: Prevalence and Associated Factors

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Tharatham Phonmanee, BEd<sup>1</sup>, Naratip Sa-nguanpanich, BSc<sup>2</sup>,  
Paraya Assanasen, MD<sup>1</sup>, Phawin Kescool, MD<sup>1</sup>, Bannapuch Pinkaew, MSc<sup>1</sup>,  
Kanokporn Talek, BSc<sup>1</sup>, and Pornjira Pariwatcharakul, MRCPsych<sup>2</sup>

## Introduction

Frontline healthcare workers (HCWs) in Otorhinolaryngology or Ear Nose Throat (ENT) had high prevalence of stress, anxiety and depression during COVID-19 pandemic.<sup>1-4</sup> As there are growing demand on clinical works of ENT-HCWs during and after the COVID-19 pandemic, it is important to understand their stress, anxiety, and associated factors so that further mental health promotion or intervention programs can be designed and implemented. This study aims to explore stress and anxiety among ENT-HCWs during the COVID-19 pandemic.

## Methods

A cross-sectional online survey was conducted in HCWs at the Department of Otorhinolaryngology, Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand from June 2021 to November 2021. All ENT-HCWs were invited through private closed groups on social media platforms, that is, Facebook and Line. The informed consent was done by implied consent. The study was approved by the Siriraj Institutional Review Board (CoA No. Si 457/2021) in accordance with the Helsinki Declaration. The questionnaire consists of (1) sociodemographic characteristics and work-related information, (2) stressors in the past one year during the COVID-19 pandemic, (3) general health state, and (4) the Thai version of the Stress and Anxiety to Viral Epidemics-9 (SAVE-9) rating scale, a 9-item self-report questionnaire specifically developed and validated to measure stress and anxiety among HCWs in response to viral epidemics<sup>5</sup> and has been validated in a national survey in Thai HCWs during the COVID-19 pandemic showing significant correlations with Maslach Burnout Inventory ( $r = .315, P < .001$ ) and Perceived Stress Scale ( $r = .283, P < .001$ ).<sup>6</sup> Descriptive statistics, independent t-test, analysis of variance (ANOVA), Mann-Whitney U test, Kruskal-Wallis H test, Spearman's correlation coefficient and a stepwise multiple linear

regression analysis were performed using SPSS version 21.0 (IBM Corp., Armonk, NY).

## Results

Among all ENT-HCWs ( $N = 288$ ), 191 HCWs responded, but six of them did not consent to participate in the study and were therefore excluded. Our final study sample had 185 responses, which accounted for 64.2% of the study population. The sociodemographic characteristics of the participants are shown in Table 1.

The prevalence of anxiety about the viral pandemic was 35.7% ( $n = 66$ ), whereas overall stress and anxiety was found in 18.4% ( $n = 34$ ) of the participants. Over one-third (37.3%) were aware that the COVID-19 pandemic had affected their anxiety which were associated with SAVE-9 score ( $P < .001$ ). Although younger participants had more stress and anxiety about the pandemic ( $F = 2.982; P = .033$ ), age was not a significant factor for work-related stress ( $K = 2.085; P = .104$ ). In contrast, being a frontline HCWs treating COVID-19 patients was significantly associated with only work-related stress ( $z = 2.260; P = .025$ ), but not linked with overall stress and anxiety. Regarding physical health in the past year, 45.9% of participants reported unchanged bodyweight, whereas others reported weight gain (38.9%) and weight loss (13.5%). However, these were not associated with anxiety or stress. Multiple linear regression analysis (Table 2) showed various factors significantly

<sup>1</sup>Department of Otorhinolaryngology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

<sup>2</sup>Department of Psychiatry, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

### Corresponding Author:

Naratip Sa-nguanpanich, Department of Psychiatry, Faculty of Medicine Siriraj Hospital, Mahidol University, 2 Wanglang Road, Bangkokknoi, Bangkok 10700, Thailand.  
Email: naratip.san@mahidol.ac.th

**Table 1.** Sociodemographic Characteristics, Self-Report Health Status of Participants and the Relationship With Stress and Anxiety in Otorhinolaryngology Healthcare Workers in a University Hospital Measured by the Stress and Anxiety to Viral Epidemics-9 (SAVE-9) Scale, Thai Version.

Variables	Participants (N = 185)  n (%)	SAVE-9 total score			Anxiety about the viral pandemic			Work-related stress associated with the viral pandemic		
		M (SD)	Statistics	P	M (SD)	Statistics	P	Median (Q1-Q3)	Statistics	P
<b>Sociodemographic characteristics</b>										
Gender			t = 0.482	.632		t = -0.337	.736		z = 1.955	.052
Male	36 (19.5)	17.19 (7.71)			12.47 (5.13)			4 (3-7.75)		
Female	149 (80.5)	16.53 (6.09)			12.75 (4.29)			4 (2-5)		
Age (years)			F = 2.836	<b>.040*</b>		F = 2.982	<b>.033*</b>		K = 2.085	.104
20-29	54 (29.2)	18.37 (7.24)			13.74 (4.83)			4 (3-6)		
30-39	67 (36.2)	16.66 (5.60)			12.73 (4.14)			4 (3-5)		
40-49	40 (21.6)	15.90 (6.93)			12.53 (4.77)			2.5 (1.25-5)		
50-60	24 (13.0)	14.08 (4.75)			10.54 (3.08)			3.5 (1-6)		
Marital status			F = 1.269	.284		F = 0.582	.560		K = 4.201	.112
Single	106 (57.3)	17.30 (6.92)			13.00 (4.74)			4 (3-6)		
Married	71 (38.4)	15.75 (5.82)			12.27 (4.12)			3 (2-5)		
Other	8 (4.3)	16.25 (3.24)			12.50 (3.21)			4 (1-6)		
Having children			F = 0.074	.929		F = 0.165	.848		K = 0.251	.778
Childless	125 (67.5)	16.78 (6.75)			12.78 (4.74)			4 (2-5)		
1 child	24 (13.0)	16.33 (5.59)			12.21 (3.58)			4 (2-6)		
≥ 2 children	36 (19.5)	16.44 (5.88)			12.75 (3.98)			3 (2-5.75)		
Profession			F = 0.221	.881		F = 0.173	.915		K = 0.326	.806
Physician	40 (21.6)	16.98 (6.99)			12.85 (4.90)			4 (2-5)		
Nurse	88 (47.6)	16.47 (6.18)			12.67 (4.30)			3.5 (2-5)		
Scientist/speech	18 (9.7)	17.61 (7.69)			13.22 (5.43)			4 (2.75-5.25)		
Pathologist/technician										
Other	39 (21.1)	16.33 (5.90)			12.36 (3.94)			3 (2-6)		
Frontline HCWs <sup>a</sup>			t = 1.398	.164		t = 0.695	.488		z = 2.260	<b>.025*</b>
Yes	53 (28.6)	17.70 (6.80)			13.06 (4.68)			5 (3-6)		
No	132 (71.4)	16.24 (6.24)			12.55 (4.37)			3 (2-5)		
<b>Self-report health status</b>								<b>M (SD)</b>		
Self-awareness of work-related stress and anxiety			t = -5.652	<b>&lt;.001***</b>		t = -5.162	<b>&lt;.001***</b>		t = -4.876	<b>&lt;.001***</b>
Yes	99 (53.5)	18.96 (6.30)			14.17 (4.34)			4.79 (2.58)		
No	86 (46.5)	14.01 (5.49)			11.00 (3.96)			3.01 (2.33)		
Has the COVID-19 situation affected your anxiety?			t = -6.071	<b>&lt;.001***</b>		t = -6.041	<b>&lt;.001***</b>		t = -4.421	<b>&lt;.001***</b>
Yes	69 (37.3)	20.06 (6.12)			15.04 (4.18)			5.01 (2.70)		
No	116 (62.7)	14.64 (5.72)			11.30 (4.01)			3.34 (2.37)		
Weight change during the COVID-19 pandemic			F = 0.966	.383		F = 0.627	.535		F = 1.377	.255
Unchanged	85 (45.9)	16.13 (5.62)			12.34 (4.10)			3.79 (2.16)		
Increased	72 (38.9)	16.58 (7.25)			12.79 (4.90)			3.79 (3.02)		
Decreased	25 (13.5)	18.16 (6.46)			13.44 (4.37)			4.72 (2.70)		
Underlying disease			t = -4.890	.625		t = -0.609	.543		t = -0.165	.869
No	151 (81.6)	16.55 (6.34)			12.60 (4.47)			3.95 (2.51)		
Yes	34 (18.4)	17.15 (6.84)			13.12 (4.42)			4.03 (3.10)		
If you have to take medicine regularly, how would the COVID-19 situation effect your medication adherence?			t = -2.014	<b>.045*</b>		t = -1.854	.065		t = -1.776	.077
No effect	181 (97.8)	16.52 (6.32)			12.61 (4.39)			3.91 (2.57)		
Better adherence	4 (2.2)	23.00 (8.83)			16.75 (5.85)			6.25 (4.19)		

Values in bold indicate statistical significance.

Abbreviations: F, ANOVA test; K, Kruskal-Wallis H test; t, the independent t-test; z, Mann-Whitney U test. SAVE-9.

<sup>a</sup>Healthcare workers working on the frontline treating patients infected with the COVID-19.

\*P < .050. \*\*\*P < .001.

**Table 2.** Multiple Linear Regression Analysis of Factors Significantly Related to Stress and Anxiety During the COVID-19 Pandemic Among Otorhinolaryngology Healthcare Workers.

Dependent variable	Factors significantly related to stress and anxiety	Unstandardized coefficients			95% Confidence interval for B		Collinearity statistics	
		B	SE	P-value	Lower bound	Upper bound	Tolerance	VIF
SAVE-9 total score	Changes of work patterns***	2.170	0.465	<.001	1.254	3.087	0.739	1.353
	Personal health concern**	1.118	0.408	.007	0.312	1.924	0.627	1.595
	Taking care of family members***	1.377	0.365	<.001	0.657	2.097	0.822	1.216
	Self-awareness of work-related stress and anxiety*	1.915	0.792	.017	0.351	3.478	0.785	1.274
	Concerns on transportation/tourism*	0.861	0.365	.019	0.140	1.580	0.759	1.318
Anxiety about the viral pandemic	Personal health concern***	1.162	0.274	<.001	0.621	1.702	0.649	1.540
	Changes of work patterns***	1.448	0.307	<.001	0.842	2.055	0.786	1.273
	Concerns on income**	0.756	0.245	.002	0.273	1.240	0.761	1.313
	Concerns on transportation/tourism**	0.721	0.246	.004	0.236	1.206	0.778	1.286
Work-related stress associated with the viral epidemic	Changes of work patterns***	0.767	0.213	<.001	0.348	1.187	0.808	1.238
	Taking care of family members***	0.616	0.162	<.001	0.297	0.935	0.961	1.041
	Self-awareness of work-related stress and anxiety**	1.149	0.368	.002	0.424	1.874	0.837	1.195

Abbreviations: B, unstandardized coefficient; SAVE-9, the 9-item Stress and Anxiety to Viral Epidemics Scale; SE, standard error; VIF, variance inflation factor.

\* $P < .050$ . \*\* $P < .010$ . \*\*\* $P < .001$ .

related to stress or anxiety. “Changes of work patterns” was the only factor associated with both anxiety about the pandemic ( $B = 1.448$ ,  $SE = 0.307$ ,  $P < .001$ ) and work-related stress ( $B = 0.767$ ,  $SE = 0.213$ ,  $P < .001$ ), as well as the SAVE-9 total score ( $B = 2.170$ ,  $SE = 0.465$ ,  $P < .001$ ).

## Discussion and Conclusion

This online survey explored associated factors of stress and anxiety in Otorhinolaryngology HCWs at a university hospital during the COVID-19 pandemic. The prevalence of anxiety in our study are in accordance with results from previous surveys which used self-report questionnaires validated in general population. The prevalence of anxiety in ENT-HCWs from previous studies are 38% by General Anxiety Disorder scale (GAD-7),<sup>2</sup> 29.18% by Zung Self-rating Anxiety Scale,<sup>3</sup> and 7.8% measured by the Coronavirus Anxiety Scale (CAS).<sup>7</sup> To our knowledge, this is the first survey in ENT-HCWs using a newly developed screening tools for stress and anxiety among HCWs in response to viral epidemics, the SAVE-9.

Our results demonstrated that frontline ENT-HCWs experienced significantly more work-related stress than their counterparts. Recent researches suggested that risks for anxiety are being physicians or nurses,<sup>3</sup> being in residency training,<sup>7</sup> having colleagues or family members who were infected with COVID-19,<sup>3</sup> self-suspiciousness of COVID-19 infection,<sup>3</sup> and being frontline HCWs working in cohort wards or infectious isolation wards.<sup>3,8</sup> Our results

demonstrated that younger age was associated with higher levels of stress and anxiety about the pandemic across all professions in Otorhinolaryngology, but did not link with work-related stress. Our findings suggest that, in ENT-HCWs, younger age and “changes” in work patterns are major contributors to anxiety during the COVID-19 pandemic. Further studies are needed to explore more personal factors such as coping style, stress management skills, and other psychological factors to understand the risk and protective factors and thus more effective intervention can be implemented to help designing public health policy to prevent mental health problems in ENT-HCWs.

This study had limitations. First, the causality between anxiety and work-related stress could not be established because of the cross-sectional study design. Second, as this research was carried out at a tertiary university hospital, the findings may not be applicable to HCWs in other settings. Despite the study’s limitations, the findings suggest that ENT-HCWs treating or managing patients with probable COVID-19 were at a higher risk of developing psychiatric symptoms because of their fears and worry about work and social relationships. Early detection and effective intervention programs targeting both work-related stress and stress from other problems among HCWs are thus essential. Beside promoting knowledge about safe practices to minimize the risk for COVID-19 infection,<sup>9</sup> healthcare authorities should also address concerns related to mental health in ENT healthcare practitioners.

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## ORCID iDs

Tharatham Phonmanee  <https://orcid.org/0000-0002-6863-4750>

Naratip Sa-nguanpanich  <https://orcid.org/0000-0002-9546-2683>

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