

## Surgeons' fear of getting infected by COVID-19: A global survey

### Editor

During the last three months, COVID-19 pandemic had led to a serious backlog of operations globally, and plans for restarting operation are imperative<sup>1-3</sup>. Recommendations for surgical activities were studied, aiming to protect the surgical staff from being infected<sup>4,5</sup>. In the meantime, it is also important to give attention to the surgeon's personal feeling during work. We conducted

a survey to investigate global surgical practices during the COVID-19 pandemic<sup>6</sup>, and the surgeon's personal feeling was also investigated in the survey. In this special letter, we performed multivariate analysis to explore factors that associated with surgeon's fear of getting infected by COVID-19.

In total, 1124 surgeons from 936 centers in 71 countries replied to the questions. Regarding surgeon's satisfaction towards hospital's preventive measures, 612 of the respondents (54.4%) agreed that their centers were taking

enough preventive measures to avoid in-hospital transmission. With respect to the results by nations, respondents from the UK reported lowest satisfaction (6/27, 22.2%), while those from China (70/73, 95.9%) and the Netherland (26/33, 78.8%) reported higher satisfaction. When asked about the personal fear of getting sick or infecting others (1 point = never, 5 points = always), the respondents in overall reported a relatively high score (the mean  $\pm$  SD of all respondents:  $3.7 \pm 1.3$ ). The respondents from Mexico ( $4.7 \pm 0.6$ ,  $n = 31$ ),

**Table 1** Univariate and multivariate analysis on factors associated with surgeon's fear (Total  $N = 1124$ )

Factors		Fear <sup>a</sup> , n (%)	Univariate		Multivariate		
			OR	P value	OR	95%CI	P value
High risk country	Yes	273 (64.8)	1.264	<b>0.067</b>	1.055	0.781-1.424	0.729
	No	416 (59.3)	Ref.				
Gloves easily get	Yes	647 (60.8)	0.591	<b>0.077</b>	0.65	0.334-1.264	0.204
	No	42 (72.4)	Ref.				
Gowns easily get	Yes	413 (59.5)	0.809	<b>0.096</b>	1.07	0.806-1.421	0.64
	No	276 (64.5)	Ref.				
Eye-protector easily get	Yes	289 (60.8)	0.959	0.739			
	No	500 (61.8)	Ref.				
Surgical mask easily get	Yes	520 (58.3)	0.505	<b>&lt;0.001</b>	0.623	0.435-0.893	<b>0.01</b>
	No	169 (73.5)	Ref.				
FFP2/N95 easily get	Yes	166 (62.6)	1.071	0.637			
	No	523 (61.0)	Ref.				
Hand sanitizer easily get	Yes	596 (60.9)	0.837	0.34			
	No	93 (65.0)	Ref.				
Satisfaction to hospital measures	Yes	325 (53.2)	0.439	<b>&lt;0.001</b>	0.464	0.355-0.606	<b>&lt;0.001</b>
	No	339 (72.1)	Ref.				
COVID-19 caseload in hospital	>10	290 (60.2)	1.081	0.544			
	<10	306 (58.3)	Ref.				
Performing surgery with PPE	Yes	256 (64.6)	1.237	0.1			
	No	433 (59.6)	Ref.				
Testing everyone before surgery	Yes	119 (57.5)	0.818	0.199			
	No	570 (62.3)	Ref.				
No guideline available	No	142 (68.6)	1.47	<b>0.019</b>	1.341	0.951-1.892	0.094
	Guideline available	547 (59.8)	Ref.				
Routine chest CT before surgery	Yes	161 (58.5)	0.853	0.262			
	No	528 (62.3)	Ref.				
Experience of asymptomatic patients	Yes	200 (69.4)	1.603	<b>0.001</b>	1.311	0.925-1.859	0.128
	No	489 (58.6)	Ref.				
Experience of in-hospital infections	Yes	259 (67.8)	1.518	<b>0.002</b>	1.457	1.052-2.018	<b>0.024</b>
	No	430 (58.1)	Ref.				
Staff get universal test	Yes	21 (61.8)	1.016	0.965			
	No	668 (61.4)	Ref.				
Staff get infected	Yes	249 (67.1)	1.443	<b>0.006</b>	1.203	0.881-1.643	0.246
	No	440 (58.6)	Ref.				

<sup>a</sup>Number of surgeons with fear:  $N = 689$  (61.3%) OR, odds ratio, Ref, Reference, PPE, personal protective equipment, CT, computed tomography.

the US ( $4.2 \pm 1.2$ ,  $n = 51$ ) and Turkey ( $4.2 \pm 1.0$ ,  $n = 38$ ) had higher scores, while those from the Netherlands ( $2.5 \pm 1.2$ ,  $n = 33$ ) and China ( $2.6 \pm 1.4$ ,  $n = 73$ ) had lower scores.

In order to explore factors that were associated with surgeon's fear of getting infected, univariate and multivariate analysis were performed using the data from the entire survey (including content about COVID-19 testing policies, protective measures and COVID-19 caseload) (Table 1). Surgeons with personal fear were defined as those with 4 or 5 points in the question "Have you ever been afraid of getting sick or infecting others because of your work?". The factors with  $P$  values  $< 0.1$  in the univariate analysis were high risk country ( $P = 0.067$ ), shortage of gloves ( $P = 0.077$ ), shortage of gowns ( $P = 0.096$ ), shortage of surgical masks ( $P < 0.001$ ), satisfaction to hospital's measures ( $P < 0.001$ ), available guideline ( $P = 0.019$ ), episodes with asymptomatic patients in surgical settings ( $P = 0.001$ ), experiencing in-hospital infections ( $P = 0.002$ ), and staff infections ( $P = 0.006$ ). The multivariate analysis of these parameters revealed that shortage of surgical masks (OR: 1.605, 95%CI: 1.120-2.299,  $P = 0.01$ ), dissatisfaction towards hospital's preventive measures (OR: 2.155, 95%CI: 1.650-2.813,  $P < 0.001$ ) and experiencing in-hospital infections (OR: 1.457, 95%CI: 1.052-2.018,  $P = 0.024$ ) were independently associated with surgeon's fear of getting infected. It is noteworthy that high caseload ( $> 10$  cases) of COVID-19 in the centers ( $P = 0.544$  in univariate analysis) and countries' pandemic status of high risk ( $P = 0.729$  in multivariate analysis) were not related to surgeon's fear. (High risk countries are defined as the ones with death case number of COVID-19 being more than 5000 on 8<sup>th</sup> April.)

This survey clarified the current surgeons' fear of getting infected due to

their work, and the fear was particularly associated with surgical mask shortage and experiencing in-hospital infections. Since the propagation of the virus is subsiding, many hospitals are currently restarting elective surgeries. With increasing surgeons' workload, the social support for the surgeons' fear and securing working environment with enough PPE supply are warranted.

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