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Short Communication

Teaching safety - Resident anaesthetists at the forefront of COVID-19

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Abstract: We aimed to evaluate the impact of the COVID-19 pandemic on anaesthesiology residents in a COVID-19 hub hospital in Latium and ascertain their level of perceived justice and work-related stress. Residents and specialist anaesthesiologists were recruited during April–May 2020. Informational and procedural justice were measured with the Organizational Justice questionnaire; work-related stress was measured with the Effort Reward Imbalance questionnaire. Interns perceived a significantly lower level of informational justice than specialists. Organizational justice protected from occupational stress (OR=0.860, CI95% 0.786–0.940). Our findings suggest that it would be useful to improve knowledge of safety measures in trainees, increasing their confidence in work organization and reducing stress.

Key words: Education, Organizational justice, Effort, Reward, Health care workers, Anaesthesiology, Stress

The 2019 coronavirus pandemic (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has not only led to health and socio-economic problems, but has also severely tested the ability of medical schools to provide the training and professional skills needed to reach the new levels of care required by the pandemic. As the pandemic has spread, scientific associations and research study groups have issued recommendations for the general management of COVID-19 patients[1)], particularly during aerosol generating procedures involving the airway, such as emergency tracheal intubation, cardiac arrest, anaesthetic care and tracheal extubation[2)]. Only the most experienced doctors, who have already had the opportunity to work with patients with respiratory infections, are familiar with these procedures that constitute an additional new work task for trainees. In medical schools, the pressing demand for new specialists has led to the hiring of residents on fixed-term contracts before they have completed their period of specialization. This has undoubtedly burdened these doctors with new and greater clinical responsibilities at a time when they are still completing their training, exposing them to the risk of clinical errors and inappropriate behaviours[3)]. Therefore, we aimed to evaluate the perception of the correctness of safety procedures in resident anaesthetists working in an Italian COVID-19 hub hospital during the first phase of the pandemic and compare it with

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that of permanent contract anaesthetists working in the same hospital.

The survey was conducted during the first wave of COVID-19 in the months of April and May 2020. The anaesthetists treating COVID-19 patients were invited to participate in an online survey by means of the SurveyMonkey© platform. The perception of Organizational Justice (OJ), which refers to how an employee judges the fairness of processes and procedures in the organization[4], was investigated using the Italian version[5] of the Colquitt questionnaire, which comprises the subscales of Procedural Justice (PJ) and Informational Justice (IJ). PJ was measured by 7 items (e.g., "Were you able to express your views and feelings during those procedures?"); IJ was measured with 5 items (e.g., "Do you think the communications you received were reliable?"). Each question was answered according to a 5-point Likert scale. Work-related stress was measured using the Italian version[6] of the "Effort Reward Imbalance" (ERI) model, which postulates that failed reciprocity between high efforts spent at work and low rewards received in turn elicits strong negative emotions and stress reactions with adverse long-term effects on health. The Effort subscale was based on three questions (e.g., "I'm always under pressure for the workload") with responses ranging on a 4-point Likert scale; the total score ranged from 3 to 12. The Reward sub-scale was based on seven questions (e.g., "Considering all my efforts and what I have achieved, I receive the respect and prestige I deserve at work"); consequently, this score ranged from 7 to 28. Stress was measured as the weighted ratio between Effort and Reward. The effect of organizational justice on occupational stress was assessed by logistic regression, with adjustment for age and sex. The study was authorized by the University Ethical Committee (ID 3292). Prior to participation, all participants gave their written informed consent. Analyses were conducted using the IBM/SPSS 26.0 package.

50 out of 77 residents (65%), and 40 out of 64 specialist anaesthetists (63%) took part. Residents were mainly female (30, 60%) under 35 years of age (49, 98%). Of the predominantly male anaesthesia specialists (58%), half were over 35 years old. Resident trainees perceived lower levels of procedural and informational justice than specialist anaesthesiologists. The difference was very significant for IJ, which refers to the way information is transmitted. The overall organizational justice score was also significantly lower in residents than in specialists with a permanent contract (Table 1). Perceived stress levels were very high (effort/reward ratio >1) in 38 (76%) of the residents, and in 24 (65%) of the anaesthesiologists. The variables that express organizational justice (PJ and IJ) were correlated with each other and inversely correlated with the reward received by workers. Effort and reward were inversely correlated with each other (Table 2). In a multivariate logistic regression model, adjusted for age and gender, perceived organizational justice was a significant protective factor for work-related stress (Table 3).

Our study showed that in the first phase of the COVID-19 pandemic, residents working in a COVID-19 hub hospital reported a lower level of organizational justice than specialist anaesthesiologists and that perceived justice was inversely related to occupational rewards. Organizational justice acted as a protective factor for occupational stress. The findings of our study, which to the best of our knowledge is the only one that has compared the perception of organizational justice in anaesthesiology trainees and specialists during COVID-19, confirm the evidence in the literature. Resident anaesthetists are unanimously considered to be highly exposed to occupational stress, burnout, and depression[7, 8]. In many countries, including Italy, anaesthesiologists in teaching hospitals complain of insufficient teamwork, difficulty in recognizing, discussing, and correcting errors and reluctance on the part of senior theatre

Table 1. Comparison of Organizational Justice and work-related stress perceived by residents and anaesthetists during the COVID-19 pandemic

	Residents	Anaesthetists	Student's T	Mann-Whithey U
Variable	Mean ± s.d	Mean ± s.d	*p*	*p*
Procedural Justice (range 7–35)	16.6 ± 4.1	18.9 ± 5.7	0.031	0.113
Informational Justice (range 5–25)	12.7 ± 3.4	15.3 ± 2.9	0.001	0.000
Organizational Justice (range 12–60)	29.3 ± 6.5	34.1 ± 7.6	0.002	0.004
Effort (range 3–12)	8.2 ± 1.6	8.1 ± 2.0	0.668	0.654
Reward (range 7–28)	16.2 ± 3.0	16.8 ± 4.1	0.445	0.436
Effort/reward Imbalance ERI	1.23 ± 0.35	1.3 ± 0.66	0.748	0.319

Table 2. Correlations between Justice and Stress subscales

		PJ	IJ	Effort	Reward
PJ Procedural Justice	Pearson's r	1	0.524**	−0.171	0.390**
	Two tailed *p*		0.000	0.108	0.000
IJ Informational Justice	Pearson's r		1	−0.200	0.358**
	Two tailed *p*			0.059	0.001
Effort	Pearson's r			1	−0.339**
	Two tailed *p*				0.001
Reward	Pearson's r				1

** $p<0.001$

Table 3. Association of organizational justice with work-related distress (ERI>1)

			95% C.I.	
Variable	*p*	OR	Inferior	Superior
Gender	0.142	2.168	0.771	6.097
Age class	0.678	1.291	0.387	4.311
Organizational Justice	0.001	0.860	0.786	0.940

staff to accept input from junior members[9]. In the early stages of the pandemic, some of the trainees may have felt the lack of a framework designed to help them understand the principles and practices surrounding personal protective equipment decision making. This subjective response does not correspond to a different organization between employed and resident doctors. All residents received the same information, instructions and evidence reserved for structured personnel. They have also never been left alone but have been constantly supported by the presence of a structured tutor. The subjective answers to the questionnaire express the insecurity of younger workers and the greater difficulty in entering an unexpected job situation. The sudden need to confront an unknown disease and to adopt new safety measures - initially without sufficient knowledge of the risk - may have undermined confidence in the organization's fairness among the less experienced workers, increasing the stress levels of residents. It is very important that health care organizations understand the vulnerability of young intensivists. Distress among hospital physicians is detrimental to the health and safety of patients. For this reason, provisions for controlling the pandemic should include thorough training on safety measures for interns. Teamwork and support for trainees on the part of colleagues already included in the organization of the health care company are also essential for guaranteeing top-quality care. Efforts to support young intensivists must be continuous and aimed at making them understand the reasons for the safety measures and the fairness of the organization.

Our study has the limitation of having been conducted on a small sample with a cross-sectional model. However, this study was the baseline of a repeated cross-sectional study that aims to follow frontline workers with repeated surveys during the pandemic; it was attended by more than half of the anaesthesiologists in one of the two COVID-19 hub centres in central Italy. Our perspective is to follow the evolution of the mental health of frontline workers during the pandemic, immediately reporting to the employer the evolution and the need for corrective interventions.

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Competing Interests

None declared

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