

# Determinants of Work-Related Quality of Life in French Anesthesiologists

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**BACKGROUND:** Little evidence is available regarding work-related quality of life (WRQoL) for anesthesiologists. We aimed to explore factors associated with WRQoL among French anesthesiologists.

**METHODS:** The study surveyed French anesthesiologists qualified for more than 2 years. The primary objective was the determination of factors associated with WRQoL. Factors analyzed included demographic characteristics, lifestyle, financial status, personality traits, professional relations, management and organization, and occupational tasks when at work. Statistical analyses were performed using a multivariable quantile regression model.

**RESULTS:** Overall, 2040 anesthesiologists responded to the survey and 1922 responses were analyzed. The latter represents 19% of practicing French anesthesiologists. The following factors were independently associated with increased WRQoL: family income, long-term employment, organizational and managerial factors (lesser weekly workload, the belief of providing high quality, safe health care services, team management, and operating theatre organization), human relations (satisfaction with workplace ambiance and relations with hospital management and colleagues), and occupational tasks (participation in team activities). Three personality traits were found to be significantly associated with increased WRQoL: extraversion, conscientiousness, and openness. Neuroticism was associated with reduced WRQoL.

**CONCLUSIONS:** The current study demonstrates exogenous and endogenous factors associated with increased WRQoL in anesthesiologists. Results should be considered as explorative and provide hypotheses for further research in this domain. (Anesth Analg XXX:XXX:00–00)

## KEY POINTS

- **Question:** What are the factors associated with work-related quality of life (WRQoL) for French anesthesiologists?
- **Findings:** Better organizational and managerial quality, relationships with colleagues, occupational tasks, personality traits, annual family income, along with reduced weekly workload were associated with increased WRQoL.
- **Meaning:** The optimization of managerial and organizational strategies should be considered when aiming to improve WRQoL for anesthesiologists.

## GLOSSARY

**CNIL** = Committee for electronic data recording; **IQR** = interquartile range; **IRB** = institutional review board; **WRQoL** = work-related quality of life; **WRQoLHW** = WRQoL was measured using a validated tool for health care workers

During the past 3 decades, 2 major transformations have occurred in western health care systems, namely, the implementation of modern management strategies and the acceptance of the concept that economic constraints increasingly determine health care delivery. Higher consideration is given to

client needs, increased economic efficiency is expected of providers, and tight management of human resources is required.<sup>1</sup> As a result, caregivers have experienced major changes in their working life, from increased managerial input to rationed resources dedicated to clinical care.<sup>1</sup> In addition to major managerial changes

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and rationalized resources, the emotional nature of health care delivery<sup>2</sup> and lifestyle conditions including longer commutes have been implicated in negative psychological and behavioral changes, leading ultimately to an increase in both burnout symptoms and addiction behaviors in health care providers.<sup>3–6</sup>

Work-related quality of life (WRQoL) is a concept that has been developed to quantify work-related physical and psychological consequences and has garnered attention given its potential for guiding measures aimed at reducing burnout.<sup>4–6</sup> In addition, poor WRQoL has been associated with reduced engagement at work,<sup>7</sup> increased staff turnover,<sup>8</sup> and reduced managerial commitment.<sup>9</sup> Moreover, evidence suggests a relationship between WRQoL and performance potentially resulting in poorer patient care.<sup>10</sup> In summary, poor WRQoL is a self-sustaining phenomenon generating bad outcomes for both health care workers and for patients.

WRQoL has been the subject of intense research. This is particularly the case in professional groups such as health care workers, where skilled human resources are considered one of the most important assets.<sup>11</sup> These studies, often involving paramedical workers,<sup>12–14</sup> have determined factors influencing WRQoL. Such factors include family-work balance, managerial strategies, work organization, monetary income, and social relations within the workplace.<sup>13–17</sup> Data on factors associated with WRQoL in medical practitioners remain incomplete, and managerial responses to poor WRQoL vary across studies and occupations.<sup>5,18</sup> It appears pertinent to target specialties with a high proportion of burnout symptoms when adding to our knowledge in this area.<sup>5</sup> For this reason, we undertook a national survey of anesthesiologists in France, assessing factors that have previously been described as affecting WRQoL. The primary study objective of this study was to determine factors associated with WRQoL. The secondary objectives were as follows: (a) quantitative description of description WRQoL in French anesthesiologists and (b) quantifying the difference in WRQoL between physicians working in public and private sectors.

## METHODS

The study design was approved by our institutional review board (IRB: Comité d'évaluation de l'éthique de la recherche de l'hôpital Robert Debré #2018-418 on December 11, 2018; Chairman Dr Sophie Guillemin-Crepon) and by the national Committee for electronic data recording (CNIL). The requirement for written informed consent was waived by the IRB. The study consisted of a completely anonymous electronic survey sent via e-mail and response to the survey implicitly indicated agreement to the use of data for the current study, as permitted by our ethics committee.

The study consisted of an electronic survey sent via the Google Forms online platform (Google,

Mountainview, CA). The survey was distributed once via major French professional networks: the French Society of Anesthesiology and Intensive Care, the French College of Anesthesiology and Intensive Care, the National Union of Public Anesthesiologists, and Intensivists and 2 private consortiums (ELSAN [Paris, France] and Ramsay Générale de Santé [Paris, France]). A reminder to complete the survey was sent by the primary author weekly on Tuesdays. The criterion for ending the study was the absence of response for more than 15 days.

The inclusion criterion was all anesthesiologists working on French territory. To assess conditions associated with WRQoL in France, the following exclusion criteria were applied: professional experience in France  $\leq 2$  years and junior physicians still in training.

WRQoL was measured using a validated tool for health care workers (WRQoLHW).<sup>19</sup> This tool explores the following dimensions of WRQoL: job and career satisfaction (possible score: 6–30), general well-being (possible score: 6–30), home-work interface (possible score: 3–15), stress at work (possible score: 2–10), control at work (possible score: 3–15), and working conditions (possible score: 3–15). The overall WRQoL score was calculated by the sum of subscale scores and ranged from 23 to 115 points.

To select organizational, management, and human relations factors to be investigated in the current study, we explored the literature regarding WRQoL<sup>12,14,17,18,20,21</sup> and qualitatively reported all independent concepts associated with WRQoL (Supplemental Digital Content 1, File 1, <http://links.lww.com/AA/D372>). Factors included in the survey included identified concepts pertinent to the professional environment of anesthesiologists in France (File 1, Supplemental Digital Content 1, <http://links.lww.com/AA/D372>); specifically, satisfaction with workplace atmosphere, quality of team management, operating theatre organization, quality of relations with colleagues and quality of relations with hospital management. Also included was participation in organizational and academic team activities, postoperative patient care, hospital/institutional activities, medical societies activities, and the belief of providing high-quality safe health care services.

Final items included in the survey were as follows: (a) WRQoLHW items; (b) demographic and lifestyle data: age, gender, living as a couple, having children, annual personal incomes (<50,000€, 50,000–100,000€, 100,000–150,000€, 150,000–200,000€, >200,000€), and annual family incomes (<50,000€, 50,000–100,000€, 100,000–150,000€, 150,000–200,000€, 200,000–250,000€, and >250,000€); (c) professional practice: percentages of public and private activities (25%, 50%, 75%, 100%), duration of employment, weekly workload (<35, 35–48, 48–60, and >60 hours); (d) organization,

management, and human relations; (e) personality traits using a validated French translation of the Big-Five Inventory questionnaire.

This questionnaire assesses the following personality trait: extraversion (energy, positive emotions, assertiveness, sociability, and the tendency to seek stimulation in the company of others, talkativeness), agreeableness (tendency to be compassionate and cooperative rather than suspicious and antagonistic toward others; trusting and helpfulness of nature, well-tempered in nature or not), conscientiousness (a tendency to be organized and dependable, self-discipline, act dutifully, to aim for achievement, and to prefer planned rather than spontaneous behavior), neuroticism (prone to psychological stress), and openness (appreciation of art, emotion, adventure, unusual ideas, curiosity, and variety of experience) (extraversion, agreeableness, conscientiousness, neuroticism, and openness).<sup>22,23</sup> An English translation of the survey may be found in Supplemental Digital Content 2, File 2, <http://links.lww.com/AA/D373>.

Items of the survey were determined through a consensus involving the following professionals: (a) 4 physicians working in both public (M.-C.B., D.M., and S.D.) and private (B.G.) facilities in France, (b) 3 consultants from the French Agency for the improvement of the quality of work (S.D., O.L., and S.D.: see section Acknowledgments), and (c) 1 consultant from the French high authority of health care (V.G.: see section Acknowledgments).

Before analyses, the normality of distribution of WRQoLHW was assessed and results described a non-Gaussian distribution (Shapiro-Wilk test significance: <0.001, Kolmogorov-Smirnov test significance: <0.001, quantile-by-quantile histogram exhibiting non-Gaussian shape: Supplemental Digital Content 2, File 3, <http://links.lww.com/AA/D374>). As a consequence, nonparametric tests were applied for analyses. Descriptive statistics were displayed as median and (interquartile ranges 25%–75%) for continuous variables and N (%) for discrete and coded variables.

To assess the representativeness of our cohort, we compared demographic data (age) and private versus public professional practice to national 2018 data from the statistical division of the French Ministry of Health.

With respect to the primary objective of the study, the following potential determinants of WRQoLHW were analyzed: demographic and lifestyle data; organization, management, and human relations; and personality trait data (Supplemental Digital Content 2, File 2, <http://links.lww.com/AA/D373>). All variables were simultaneously entered in a multivariable quantile regression model of the median.<sup>24</sup> Finally, the correlation between observed and predicted values of WRQoLHW was computed with a Spearman test.

Differences between private and public activity were compared using the Mann-Whitney *U* test for continuous variables. Other variables were analyzed using  $\chi^2$  test (or the Fischer exact test when at least 1 sample in the contingency table was <5). This comparison included physicians with 100% activity in 1 of the 2 sectors and was applied to WRQoL and to all potential explicative factors analyzed in the current study.

Statistical analysis was performed using SPSS 26.0 software (IBM Company, Chicago, IL). The level of significance was set to 0.05.

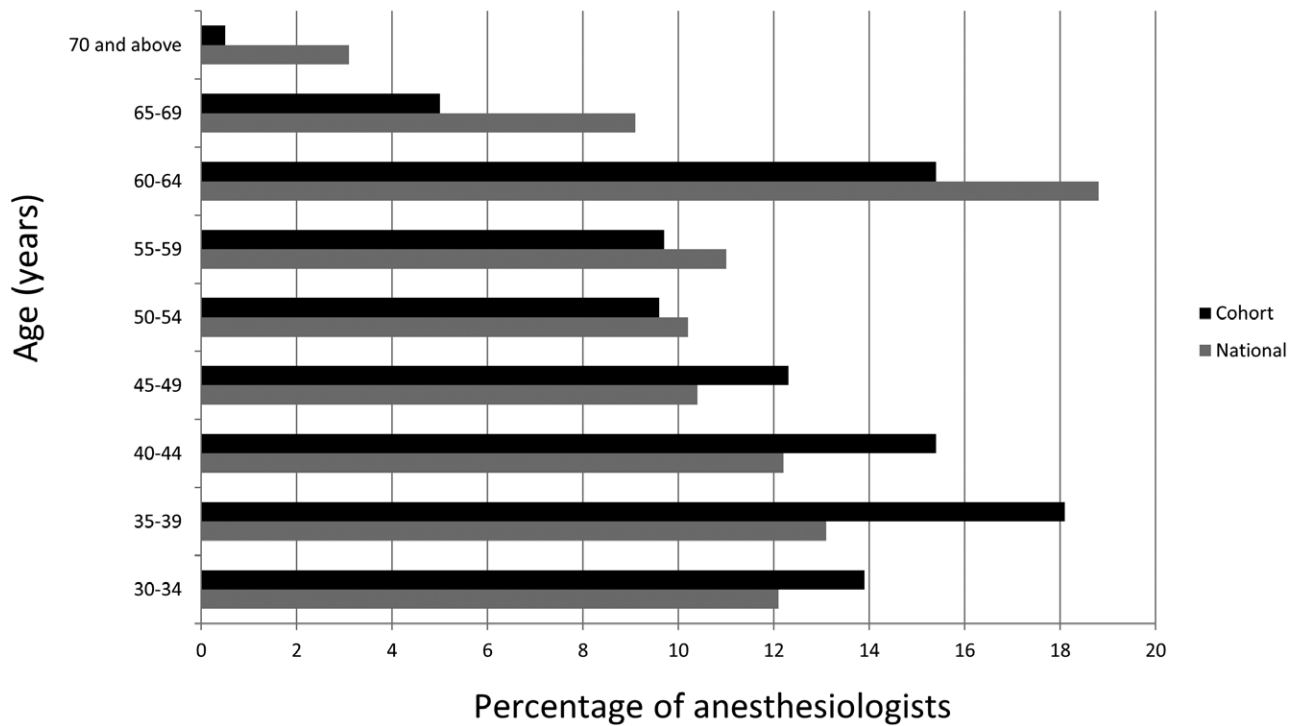
## RESULTS

During a period of 6 months (January to June 2019), 2040 anesthesiologists responded to the survey. Responses ceased 4 months after the initial online diffusion despite bimonthly reminders (the first 16 reminders sent by the first author resulted in further survey responses, and then 8 further reminders were sent without response). One hundred and eighteen surveys were excluded because responders were <2 years post specialty graduation. The remaining 1922 responses were analyzed. According to statistics from the ministry of health, 10115 anesthesiologists were working in 2018; responders represent 20.2% of this total and analyzed responses 19.0%.

The percentages of anesthesiologists per 5-year age range in our cohort and in national statistics are displayed in Figure 1. Mean age was 48 years in the study cohort and 50 years in the national population of anesthesiologists, respectively. The proportion of anesthesiologists working exclusively in the public sector was 67.3% in our cohort and 56.0% in national data. Table 1 and Figure 2 display the description of responses and items of the questionnaire.

Results of the multivariable quantile regression are shown in Table 2. Factors associated with the increased WRQoL included long-term employment, higher annual family income, lower weekly workload, higher satisfaction with workplace ambiance, better quality of relations with the hospital management and colleagues, better quality of team management and operating theatre organization, and more participation in organizational team activities. Three personality traits were found to be associated with increased WRQoL: extraversion, conscientiousness, and openness. Neuroticism was associated with reduced WRQoL. Spearman correlation between the observed and predicted WRQoLHW was 0.79 ( $P < .01$ ).

Comparisons between physicians working exclusively in private and public sectors are displayed in Table 3 and Figure 3. Comparisons were performed on 1633 responders (N = 338 and 1295, in private and public facilities, respectively); other physicians were not at full time in either structures. Physicians in the



**Figure 1.** Age distribution among survey responders and 2018 National data regarding French anesthesiologists (N = 1922 in the cohort and 10115 in the national statistics).

private sector reported higher: long-term employment, income, satisfaction with all items of organization and management, human relations, and occupational tasks. The only exception was the item satisfaction with hospital and institutional activities that was significantly higher in public practice responders and the item satisfaction with the participation in medical societies activities that did not differ between the 2 groups. WRQoL was significantly increased in the private group for both individual items and sum total scores.

**Table 1. Descriptive Statistics (N = 1922) of Continuous Variables**

Factor	Median (IQR)
Age (y)	45 (37–57)
Work-related quality of life scale for health care workers	
Job and career satisfaction	21 (18–24)
General well-being	20 (18–22)
Home–work interface	9 (2–11)
Stress at work	6 (5–8)
Control at work	10 (8–12)
Working conditions	10 (8–12)
Overall score	77 (66–85)
Personality traits: Big-Five Inventory	
Extraversion	3 (3–4)
Agreeableness	4 (4–5)
Conscientiousness	4 (4–4)
Neuroticism	2 (2–3)
Openness	3 (3–4)

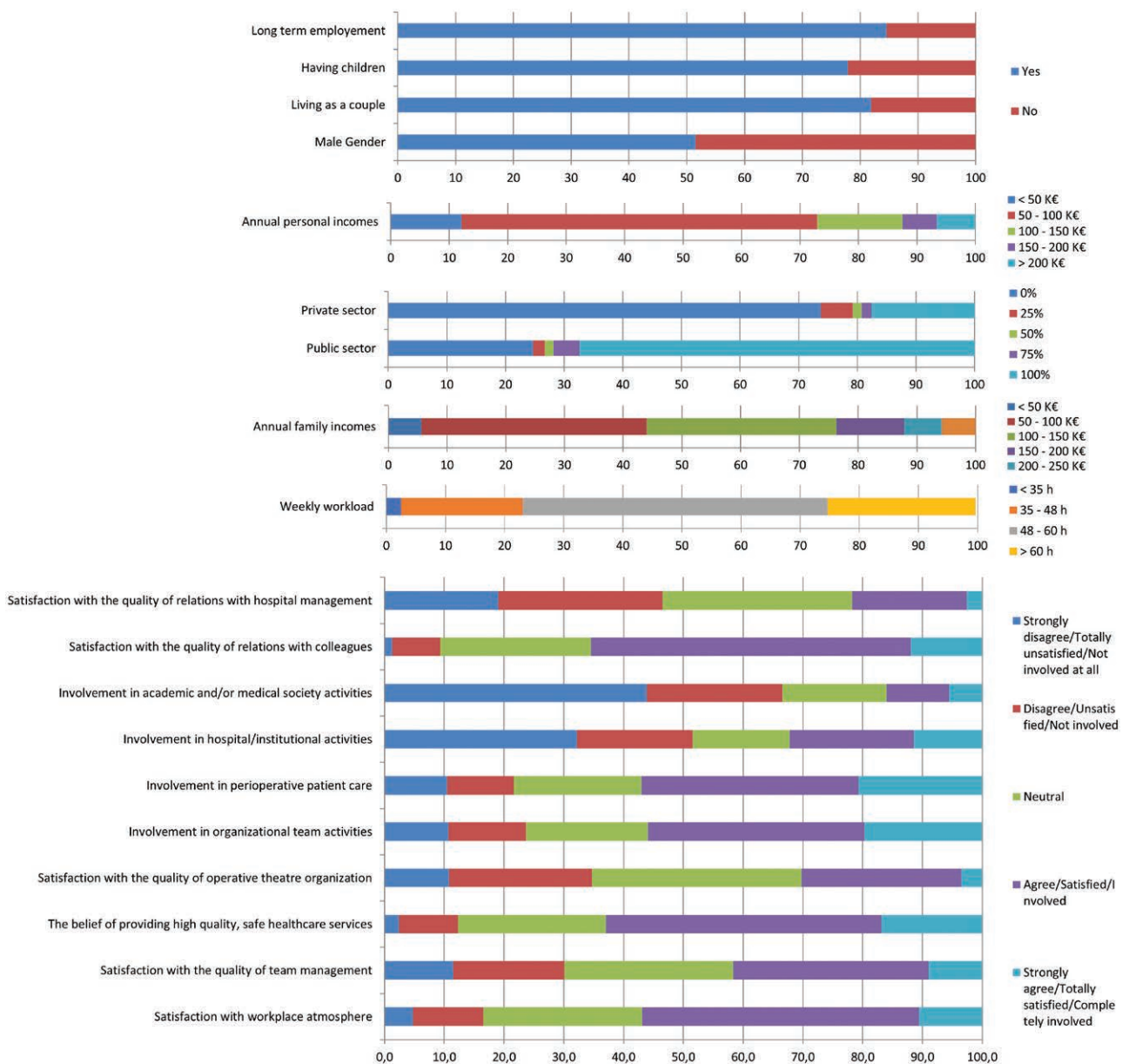
Data are expressed as median (IQR, 25%–75%).  
Abbreviation: IQR, interquartile range.

## DISCUSSION

The main findings of the current study can be summarized as follows: WRQoL of anesthesiologists in France, as measured by a previously validated tool for health care workers, was associated with: the quality of organization and management, relations with colleagues, long-term employment, occupational tasks (organizational), annual family income, weekly workload, and personality traits.

Comparing the sample obtained by our survey to the overall population of anesthesiologists working in France revealed a higher proportion of responders working in public facilities and a lower age. Our results should be interpreted in the light of these differences. Anesthesiologists working in public facilities have lower incomes when compared to those in the private sector; one might hypothesize that the expectations of public employees might involve extrafinancial needs such as research or work-private life balance. It is also of note that staff turnover in private facilities is low as a result of a relative shortage of anesthesiologists nationally. The younger age distribution in responders might partly explain the difference in public/private distribution between responders and national statistics, as physicians usually begin their career in the public sector in France.

Although major findings of the current study are explorative in nature, some of these findings may be discussed in light of the available literature. The relatively weak importance of personal financial issues



**Figure 2.** Descriptive statistics for ordinal and dichotomous variables (N = 1922). Data are expressed as percentages.

compared to other factors may seem intriguing at first glance. However, the impact of income on WRQoL has been the subject of intense debate<sup>17,24</sup> with a well-described ceiling effect of income on perceived happiness and self-accomplishment.<sup>25</sup> Conversely, the finding that perceived quality of management was a strong predictor of WRQoL is not surprising.<sup>21</sup> This result is strongly supported by results of comparisons between public and private sectors that found a concomitant increase of WRQoL associated with higher scores for managerial, relational, and occupational factors in the private sector (Table 3 and Figure 3). In addition, this is also supported by the importance of team management and work organization in daily practice demonstrated in many previous studies.<sup>15-17,26</sup>

Organization and management play important roles in daily activity and the ease with which physicians can perform their tasks.<sup>17,26</sup> Accordingly, managerial factors are probably the single most important consideration when attempting to improve WRQoL, especially in financially constrained environments. This idea is further supported by our results demonstrating higher potential margins for improvement in the areas of relations management, organization, and relationship (Figure 2).

Occupational tasks have previously been found to influence turnover behavior in physicians and nurses.<sup>7,8,15</sup> Given the importance of extraclinical activities in medicine, it is not surprising to find it as a positive predictor of WRQoL in our study.

<b>Table 2. Multivariable Quantile Regression Model (N = 1922)</b>				
<b>Factor</b>	<b>P value overall (factors)</b>	<b>Regression coefficient</b>	<b>P value for each category</b>	<b>95% confidence interval of the regression coefficient</b>
Age	.5	0.006	.5	-0.01 to 0.02
Gender male	.6	-0.2	.6	-1 to 0.6
Living in a couple	.2	-0.7	.2	-1.8 to 0.4
Having children	.053	1	.053	-0.01 to 2
Long-term employment	<b>.008</b>	<b>1.6</b>	<b>.008</b>	<b>0.4-2.8</b>
Annual personal income (€)				
<50,000		Reference		
50,000-100,000		-0.5	.4	-1.9 to 0.8
100,000-150,000	.6	-0.3	.7	-2 to 1.3
150,000-200,000		0.3	.7	-1.7 to 2.4
>200,000		0.03	1	-2 to 2
Annual family income (€)				
<50,000		Reference		
50,000-100,000		0.7	.5	-1.1 to 2.5
100,000-150,000	<b>&lt;.001</b>	1	.3	-0.8 to 2.9
<b>150,000-200,000</b>		<b>3</b>	<b>.006</b>	<b>0.8-5</b>
<b>200,000-250,000</b>		<b>3</b>	<b>.006</b>	<b>1-6</b>
<b>&gt;250,000</b>		<b>3.7</b>	<b>.006</b>	<b>1.1-6.3</b>
Weekly workload (h)				
<35		Reference		
35-48	<b>&lt;.001</b>	-1.9	.1	-4.6 to 0.7
<b>48-60</b>		<b>-3.5</b>	<b>.01</b>	<b>-6.2 to -0.8</b>
<b>&gt;60</b>		<b>-5</b>	<b>&lt;.001</b>	<b>-7.8 to -2.2</b>
Public activity >75%	.8	0.1	.8	-1.3 to 1.6
Private activity >75%	.2	1	.2	-0.7 to 2.8
Satisfaction with workplace atmosphere				
<b>1</b>		<b>Reference</b>		
<b>2</b>	<b>&lt;.001</b>	<b>3.5</b>	<b>.003</b>	<b>1.2-5.8</b>
<b>3</b>		<b>3.4</b>	<b>.004</b>	<b>1.1-5.7</b>
<b>4</b>		<b>6.4</b>	<b>&lt;.001</b>	<b>4-8.9</b>
<b>5</b>		<b>8.7</b>	<b>&lt;.001</b>	<b>5.9-11.6</b>
Satisfaction with quality of team management				
<b>1</b>		<b>Reference</b>		
<b>2</b>	<b>&lt;.001</b>	<b>3.6</b>	<b>&lt;.001</b>	<b>2-5.2</b>
<b>3</b>		<b>6</b>	<b>&lt;.001</b>	<b>4.4-7.6</b>
<b>4</b>		<b>7.9</b>	<b>&lt;.001</b>	<b>6.1-9.6</b>
<b>5</b>		<b>10.3</b>	<b>&lt;.001</b>	<b>8.1-12.6</b>
The belief of providing high quality, safe health care services				
1		Reference		
2	<b>&lt;.001</b>	-0.4	.7	-3.4 to 2.5
3		1.6	.3	-1.3 to 2.5
4		<b>5.3</b>	<b>&lt;.001</b>	<b>2.8-8.3</b>
5		<b>6.7</b>	<b>&lt;.001</b>	<b>3.7-10</b>
Satisfaction with the quality of operative theatre organization				
<b>1</b>		<b>Reference</b>		
<b>2</b>	<b>&lt;.001</b>	<b>2.3</b>	<b>.004</b>	<b>0.7-3.7</b>
<b>3</b>		<b>3</b>	<b>&lt;.001</b>	<b>1.5-4.6</b>
<b>4</b>		<b>3.3</b>	<b>&lt;.001</b>	<b>1.6-5</b>
<b>5</b>		<b>5.2</b>	<b>&lt;.001</b>	<b>2.3-8</b>
Participation in organizational team activities				
<b>1</b>		<b>Reference</b>		
<b>2</b>	<b>&lt;.001</b>	<b>2.6</b>	<b>.002</b>	<b>0.9-4.3</b>
<b>3</b>		<b>4.2</b>	<b>&lt;.001</b>	<b>2.6-5.8</b>
<b>4</b>		<b>5.7</b>	<b>&lt;.001</b>	<b>4-.3</b>
<b>5</b>		<b>7.2</b>	<b>&lt;.001</b>	<b>5.3-9.1</b>
Participation in postoperative patient care				
1		Reference		
2	.4	0.3	.7	-1.4 to 2
3		0.6	.4	-1 to 2
4		0.7	.3	-0.7 to 2.2
5		0.8	.3	-0.7 to 2.4

(Continued)

Table 2. Continued				
Factor	P value overall (factors)	Regression coefficient	P value for each category	95% confidence interval of the regression coefficient
Participation in hospital/institutional activities				
1		Reference		
2	.7	0.2	.7	-1 to 1.4
3		-0.4	.5	-1.7 to 0.9
4		-0.1	.8	-1.4 to 1.2
5		0.2	.8	-1.5 to 2
Participation in academic and/or medical society activities				
1		Reference		
2	.5	-0.5	.3	-1.5 to 0.5
3		0.3	.5	-0.8 to 1.5
4		-0.7	.3	-2 to 0.5
<b>5</b>		<b>3</b>	<b>.005</b>	<b>0.8-4.8</b>
Satisfaction with the quality of relations with colleagues				
1		Reference		
2	.01	2.1	.3	-1.7 to 6
3		3.5	.07	-0.7 to 7.3
<b>4</b>		<b>4</b>	<b>.04</b>	<b>0.1-7.8</b>
<b>5</b>		<b>5.2</b>	<b>.01</b>	<b>1.2-9.3</b>
Satisfaction with the quality of relations with hospital management				
1		Reference		
2	<.001	1	.1	-0.2 to 2.2
<b>3</b>		<b>3.6</b>	<b>&lt;.001</b>	<b>2.3-3.9</b>
<b>4</b>		<b>4.7</b>	<b>&lt;.001</b>	<b>3.2-6.2</b>
<b>5</b>		<b>4.6</b>	<b>.003</b>	<b>1.6-7.6</b>
Big-Five Inventory				
<b>Extraversion</b>	<b>&lt;.001</b>	<b>1.2</b>	<b>&lt;.001</b>	<b>0.4-1.8</b>
Agreeableness	.4	-0.2	.4	-1 to 0.6
<b>Conscientiousness</b>	<b>&lt;.001</b>	<b>1.6</b>	<b>&lt;.001</b>	<b>0.8-2.5</b>
<b>Neuroticism</b>	<b>&lt;.001</b>	<b>-1.6</b>	<b>&lt;.001</b>	<b>-2.2 to -0.9</b>
<b>Openness</b>	<b>.026</b>	<b>0.9</b>	<b>.026</b>	<b>0.1-1.5</b>

Items with the Likert scale from 1 (strongly disagree/totally unsatisfied/not involved at all) to 5 (strongly agree/totally satisfied/completely involved in). Significant results are displayed in bold.

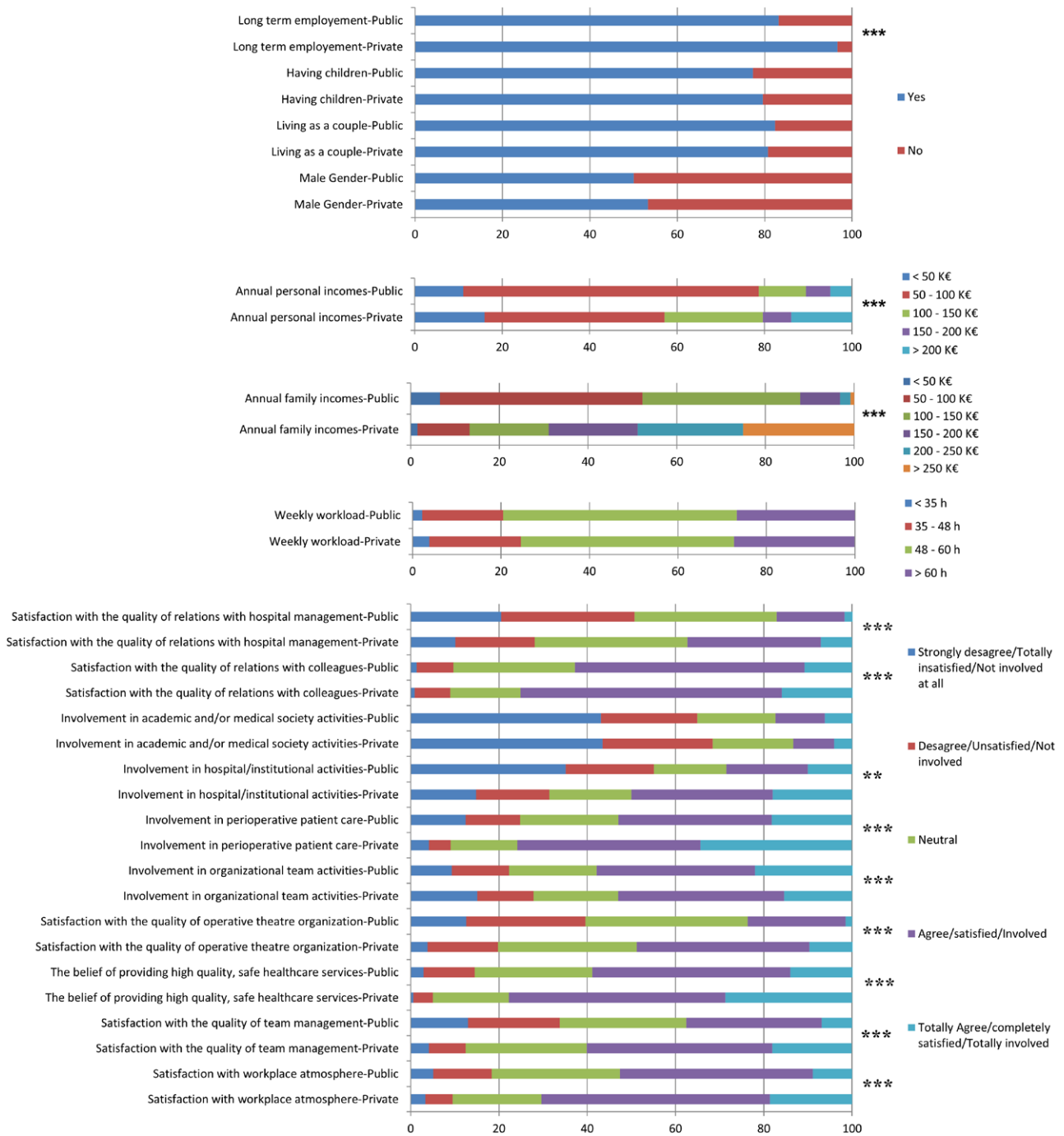
Table 3. Comparison Between Full-Time Public or Private Physicians for Continuous Variables				
Factor	Private sector (n = 338)	Public sector (N = 1295)	P value	
Age (y)	46 (37-59)	45 (37-56)	.2	
Work-related quality of life scale for health care workers				
Job and career satisfaction	23 (20-25)	21 (17-24)	<.001	
General well-being	21 (19-24)	20 (17-22)	<.001	
Home-work interface	9 (7-11)	8(6-11)	<.001	
Stress at work	6 (4-8)	7 (5-8)	<.01	
Control at work	12 (10-13)	10 (8-12)	<.001	
Working conditions	12 (9-12)	9 (7-11)	<.001	
Overall score	82 (74-89)	75 (65-84)	<.001	
Personality traits: Big-Five Inventory				
Extraversion	3 (3-4)	3 (3-4)	.2	
Agreeableness	4 (4-4)	4 (4-4)	.8	
Conscientiousness	4 (4-5)	4 (4-4)	<.01	
Neuroticism	2 (2-3)	2 (2-3)	<.001	
Openness	3 (3-4)	3 (3-4)	.2	

Data are expressed as median (interquartile ranges, 25%-75%). Comparisons were performed with either Mann-Whitney U test.

Anesthesiologists in France may work in both anesthesia and intensive care. Both specialties are characterized by their high levels of technical organization, rigorous management, and strict safety protocols, and the need for practitioners to interact with and have a reasonable understanding of many other medical specialties. Consequently, furthering the involvement

of anesthesiologists in health care organization and innovation will promote a sense of self-accomplishment among such physicians.<sup>20</sup>

Interestingly, most variables in relation to management, organization, and relationship were more assessed more favorably by anesthesiologists working in private facilities when compared with those



**Figure 3.** Comparison between full-time public or private physicians for ordinal and dichotomous variables (N = 1633). Data are expressed as percentages. Comparisons were performed using the  $\chi^2$  test.  $**P < .01$ ,  $***P < .001$ , no sign: nonsignificant comparison.

working in public institutions. Together with financial rewards, these differences might explain the superior attractiveness and retention of anesthesiologists in private facilities in France, and the relative personnel shortage observed in public hospitals. However, further investigation is required to elucidate the precise underlying causes of these differences.

Concerning personality traits, our results are in accordance with previously published articles on this subject, especially regarding extraversion and

neuroticism traits.<sup>22,27,28</sup> The results regarding the conscientiousness personality trait is more interesting. Conscientiousness trait has been associated with the choice of anesthesia as a specialty and matches well with the profession's requirements of attention, rigor, and coping.<sup>29</sup> While all other factors explored in this study may be considered exogenous and modifiable within an institution, personality traits are by definition endogenous and should be considered by those involved in people management. One can imagine



that knowledge of staff members' personality traits might help colleagues and managers to adapt work conditions according to individuals.

To our knowledge, our study is the first to examine WRQoL in such a large cohort of anesthesiologists and also the first to explore such a large number of associated factors. Administrative performance and relations are key elements when providing adequate professional infrastructure, ensuring correct payment of ward time, overtime, and promoting reasonable workloads, the latter 2 particularly in the public sector. Operating theatre organization is a subject of attention for all hospital stakeholders. Patients, nurses, surgeons, and anesthesiologists because of the tension when disorganization occurs, leading to stress, adaptation, delays, and impaired workflow. Finally, anesthesiologists consider their management to be weak. In France, health care managers are often physicians, lacking in managerial culture and education, which may in part explain the observed poor satisfaction in management performance. Efforts need to be made to improve managerial skills, interprofessional communication, and mutual understanding between craft groups.

WRQoL is usually considered as largely determined by exogenous factors; however, the current study raises attention about the importance of endogenous psychological traits that "modulate" the effects of external factors on WRQoL.<sup>28</sup> Although the routine determination of individual staff members' personality traits is not at all the intended message of this article, it remains important to consider individuals' personalities when attempting to improve WRQoL. Finally, recent studies emphasize the relationship between quality of life at work and quality of life overall.<sup>24,30-32</sup> This is not surprising given the significant workload in medicine, and especially in anesthesiology and surgery, where scheduled and emergency activities are obligatory. Consequently, improving WRQoL might indirectly improve overall quality of life.

The current study was performed in a European country and one might question its relevance to other parts of the world. Although there is no reason to consider the current results as nonapplicable in other locations,<sup>33</sup> this must be weighted by other considerations such as national or local cultures and organizations, established organizational and/or managerial policies, or incentives methods.<sup>33,34</sup>

Some of the limitations in this study are as follows: first, the sample included 19% of French physicians and might not be representative of the whole population of French anesthesiologists; however, given the multiple ways used to distribute the questionnaire and the multiple reminders, it is unlikely that this

proportion could be increased. Given the anonymous nature of the questionnaire, there was also no way to eliminate duplicate responses. However, all reminders were sent by a single investigator, which may have prevented multiple responses. "State at point in time" factors (ie, the emotional state of the physicians at the time when filling out the questionnaire: happy, unhappy, after a night shift...etc) were not explored as the number of questions to be answered was already thought to be burdensome. Given the self-assessment and declarative nature of the survey used in the current study, one cannot exclude self-reporting biases.<sup>35</sup> However, the use of a validated tool for assessing the WRQoL and anonymous responses were also suggested as a preventive strategy.<sup>35</sup> Finally, the use of multiple comparisons and statistical tests means that it is very likely that at least 1 factor significantly associated with WRQoL could be so due to type I error. That said, the aims of our study were exploratory and hypothesis generating rather than conclusive.

In conclusion, our study gives some useful insights into WRQoL in the current cohort French anesthesiologists. These insights provide a useful template for decision-makers aiming to improve physicians' quality of working life and hypothesis for further studies aiming to explore this topic. ■

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