

ORIGINAL ARTICLE

Evaluation of Burnout Among Anesthesiologists Working in Tibet, China: Altitude and Attitude

Weijia Wang¹, Le Shen^{1*}, Labaciren^{2*}, Hange Li³,
Yuelun Zhang⁴, Yuguang Huang¹

¹Department of Anesthesiology, ³Department of Education, ⁴Medical Research Center, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing, 100730 China

²Department of Anesthesiology, Tibet Autonomous Region People's Hospital, Lhasa, 850000 China

Key words: anesthesia; burnout; personal accomplishment; Tibet

Objective Burnout is a triad of emotional exhaustion, depersonalization, and reduced personal accomplishment resulting from job stress. Although with distinct regional and cultural characteristics, burnout among anesthesiologists in the Tibet has not been described. This study aimed to explore the prevalence of burnout among anesthesiologists in Tibet and its associated factors.

Methods A cross-sectional survey was conducted in Tibet, China, with an anonymous questionnaire. Social-demographic characteristics, work status, three dimensions of burnout assessed by the Maslach Burnout Inventory-Human Service Survey were collected and analyzed.

Results A total of 133 individuals from 17 hospitals completed the survey from March to June 2018. The prevalence of moderate- to high-level of emotional exhaustion, depersonalization, and burnout in personal accomplishment was 65.4% (95%CI, 57.0%–72.9%), 66.9% (95%CI, 58.5%–74.3%), and 83.5% (95%CI, 76.2%–88.8%), respectively. An annual caseload ≥ 500 , frequent overtime work and fair to poor sleep quality were significantly associated with a higher level of emotional exhaustion ($P < 0.001$, $P = 0.001$, and $P < 0.0001$, respectively). 5–9 years in anesthesiology experience was significantly associated with a high level of emotional exhaustion and depersonalization ($P = 0.002$ and $P = 0.003$, respectively).

Conclusions More than half of anesthesiologists working in Tibet experience a moderate- to high- level of burnout in at least one dimensional scale. Anesthesiologists having 5–9 years of experience are more prone to emotional exhaustion and depersonalization. Efforts to decrease burnout through reducing the working load and raising the social recognition of anesthesiologists in Tibet should be considered.

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*Corresponding author Le Shen, Tel: 86-10-69152020, E-mail: pumchshenle@aliyun.com; Labaciren, Tel: 86-891-6371322, E-mail: lbcr010203@163.com

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BURNOUT is defined as a syndrome characterized by high emotional exhaustion, high depersonalization, and reduced personal accomplishment that is experienced in response to chronic work-related stressors.^[1] Burnout contributes to poor health outcomes of health workers,^[2, 3] as well as impairments in medical care and patient safety.^[4, 5] In China, a previous study found that 69% of anesthesiologists presented with high scores on either emotional exhaustion or depersonalization,^[6] which was much higher than that in the US and European countries.^[2, 7] However, the Tibet plateau area was not included in previous researches. This area needs special attention for several reasons. The Tibetan plateau is the highest region on the earth, with an average altitude of 3000 meters. Besides the unfavorable environmental condition, Tibet is also underdeveloped economically with limited health resources.^[8, 9] Furthermore, Tibetan Buddhism has a profound influence on Tibet's culture and society, including people's perception of illness and death. Work-related stress of anesthesiologists in this region could likely have distinct characteristics. The objective of our study was to find the level of burnout in a cohort of anesthesiologists working in Tibet and to explore the associated factors.

SUBJECTS AND METHODS

This study was a cross-sectional, electronic questionnaire-based survey involving anesthesiologists from the Tibet. Ethical approval for this study was obtained from the Ethical Committee of Peking Union Medical College Hospital, Beijing, China. A statement of the purpose of the study and consent to participate in the survey were included at the beginning of each questionnaire.

Questionnaire distribution

The electronic version of the questionnaire was built on the Diaochapai platform (<http://www.diaochapai.com>). Two questionnaires were used. Questionnaire A was distributed to the anesthesiology department chief early in March 2018 and addressed the hospital category and the number of anesthesiologists in the hospitals. Questionnaire B was distributed anonymously to all anesthesiologists during a regional anesthesiology conference in Lhasa in May 2018. Questionnaire B was composed of two parts. Part 1 consisted of 12 questions. The aim of part 1 was to gather information on gender, hospital category, title, years of experience in

anesthesiology, frequency of overtime work, caseload per year, frequency of perceived challenging cases, and hours and quality of sleep. Part 2 investigated burnout levels through the Maslach Burnout Inventory-Human Service Survey (MBI-HSS) test. Data collection was completed until June 10, 2018.

Most of the participants were anesthesiologists from hospitals in Tibet. The questionnaire was distributed *via* WeChat, which is a popular mobile social platform used by more than 90% of smartphone users in China. Each mobile phone was allowed to submit the questionnaire only once to prevent duplicates.

Maslach Burnout Inventory-Human Service Survey

The MBI-HSS has become the gold standard to measure burnout in health-related fields.^[1] The MBI-HSS evaluates three dimensions of burnout—emotional exhaustion, depersonalization, and a reduced level of personal accomplishment. The MBI-HSS consists of 22 questions, of which 9 evaluate emotional exhaustion, 5 evaluate depersonalization, and 8 evaluate personal accomplishment. Subjects provided their answers on a 7-point Likert scale (encoded using the integers 0 to 6), and scores for the three different dimensions were calculated and categorized as low, moderate, or high. The ranges of the three subgroups scoring are as follows: emotional exhaustion, 0–16 (low), 17–26 (moderate), and ≥ 27 (high); depersonalization, 0–6 (low), 7–12 (moderate), and ≥ 13 (high); and personal accomplishment, 0–31 (high), 32–38 (moderate), and ≥ 39 (low).

Data analysis

The characteristics of the respondents were summarized using sample statistics. Enumeration data were expressed with count, proportion and 95%CI. Measurement data with normal distribution were presented with the mean and standard deviation. Non-normal measurement data were expressed with median (25%, 75% percentile). We also performed sub-analyses on the three-level of burnout components (emotional exhaustion, depersonalization, and low personal accomplishment) according to demographic characteristics and work status. For data with normal distribution, two independent samples tests were used to detect differences between the two samples. Comparisons between three or more groups were made with an ordinary one-way ANOVA and Tukey's multiple comparisons test. Otherwise, non-parametric methods and *Kruskal-Wallis* test were used. *P* values < 0.05 were considered statistically significant. Date

analyses were performed using Microsoft Excel 2019 and IBM SPSS Statistics 25.0 (IBM Corp., Armonk, NY, USA).

RESULTS

Burnout situation in Tibet

The data were collected from March 28, 2018 to June 10, 2018. In total, seventeen hospitals participated in the survey. Of the 163 anesthesiologists in the participating hospitals, 133 completed the survey (response rate 82%). **Fig. 1** presents the results of the three burnout dimensions for all 133 respondents. Of all the anesthesiologists, 87 anesthesiologists (65.4%; 95%CI, 57.0%–72.9%) experienced moderate- to high-level of emotional exhaustion, 89 (66.9%; 95%CI, 58.5%–74.3%) showed a moderate to high level of depersonalization, and 111 (83.5%; 95%CI, 76.2%–88.8%) experienced a moderate to high level of burnout in personal accomplishment. Basic descriptive statistics of those who responded are shown in **Table 1**. Since the Tibet plateau is a major Tibetan-inhabited minority area in China, the individual results of Tibetan and non-Tibetan respondents were listed. Comparing the sociodemographic characteristics and three dimensions of burnout, there was no significant difference between Tibetan and non-Tibetan anesthesiologists (all $P>0.05$).

Factors associated with burnout in Tibet

To further explore the factors related to each burnout dimension, we performed subgroup analyses, as shown in **Table 2**. Factors significantly associated with a higher level of emotional exhaustion were an annual caseload ≥ 500 ($P<0.001$), frequent overtime work ($P=0.001$), and fair to poor sleep quality ($P<0.0001$). Two significant factors associated with a higher depersonalization score were less than 7 hours of sleep ($P=0.027$) and fair to poor sleep quality ($P=0.012$). As for the personal accomplishment score, none of the factors in our study was found to be related to a reduced level of personal accomplishment.

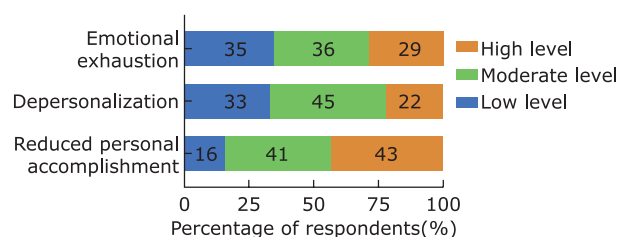


Figure 1. Results of the three burnout dimensions for all 133 respondents.

Notably, anesthesiologists with different years of experience presented significantly different levels of emotional exhaustion and depersonalization ($P=0.002$ and $P=0.003$, respectively). Anesthesiologists with 5–9 years of experience reported higher emotional exhaustion and

Table 1. Descriptive statistics of the survey respondents

Items	Tibetan	Non-Tibetan	Total
<i>n</i>	79 (59%)	54 (41%)	133 (100%)
Hospital category			
Tertiary hospitals	58 (73%)	41 (76%)	97 (73%)
Nontertiary hospitals	21 (27%)	13 (24%)	36 (27%)
Gender			
Male	31 (39%)	23 (43%)	54 (41%)
Female	48 (61%)	31 (57%)	79 (59%)
Title			
Resident	47 (59%)	27 (50%)	74 (56%)
Attending	22 (28%)	18 (33%)	40 (30%)
Academic professor	5 (6%)	6 (11%)	11 (8%)
Others	5 (6%)	3 (6%)	8 (6%)
Years of experience in anesthesiology			
<5	37 (47%)	28 (52%)	65 (49%)
5-9	17 (22%)	8 (15%)	25 (19%)
10-19	20 (25%)	9 (17%)	29 (22%)
≥ 20	5 (6%)	9 (17%)	14 (11%)
Cases of anesthesia per year			
<500	56 (71%)	28 (52%)	84 (63%)
500-999	15 (19%)	20 (37%)	35 (26%)
1000-1999	4 (5%)	5 (9%)	9 (7%)
≥ 2000	4 (5%)	4 (7%)	5 (4%)
Frequency of overtime work			
Never-sometimes	22 (28%)	16 (30%)	38 (29%)
Frequently-everyday	57 (72%)	38 (70%)	95 (71%)
Hours of sleep			
≤ 6	26 (33%)	18 (33%)	44 (33%)
≥ 7	53 (67%)	36 (67%)	89 (67%)
Sleep quality			
Excellent-good	45 (57%)	23 (43%)	68 (51%)
Fair-poor	34 (43%)	31 (57%)	65 (49%)
Maslach Burnout Inventory (score)			
Emotional exhaustion	20.5 $\pm$ 8.7	21.9 $\pm$ 11.1	20 (14, 28)
Depersonalization	9 (6, 12)	8 (5, 11.3)	9 (5.5, 12)
Personal accomplishment	34 (28, 37)	32.5 (26, 37)	33 (26.5, 37)

Data are presented as *n* (% of column), mean $\pm$ SD or median (25%, 75% percentile).

depersonalization scores than other groups (**Table 2**).

DISCUSSION

This study suggests that the frequency of moderate- to high-level burnout in anesthesiologists working in the Tibet plateau area of China was 65% for emotional exhaustion, 67% for depersonalization, and 84% for burnout in personal accomplishment. Anesthesiologists with more working load and worse sleep quality reported higher scores on emotional exhaustion. Anesthesiologists with less sleep and worse sleep quality scored higher on depersonalization. What's more, anesthesiologists with

5–9 years of experience presented higher emotional exhaustion and depersonalization scores than other groups.

In recent years, the problem of occupational stress and burnout in anesthesiologists has gained attention and awareness in different countries.^[10, 11] Burnout prevalence among anesthesiologists varied greatly from country to country.^[7] To our knowledge, there has been no previous research till now on the burnout level of anesthesiologists from high altitude areas, where the ecological condition and sociodemographic factors are different. Unlike high-income countries, we found limited surveys from other lower- and middle-income countries using the MBI-HSS scale to evaluate burnout in anesthesiologists.

Table 2. Analyses of each burnout dimension of respondents according to demographic and working characteristics

Factors	<i>n</i>	Emotional exhaustion (score)	<i>P</i> value	Depersonalization (score)	<i>P</i> value	Personal accomplishment (score)	<i>P</i> value
Nationality							
Tibetan	79	20.5 ± 0.9	0.422	9 (6, 12)	0.379	34 (28, 37)	0.630
Non-Tibetan	54	21.9 ± 1.5		8 (5, 11.3)		32.5 (26, 37)	
Gender							
Male	54	20.4 ± 1.2	0.484	8 (5, 12)	0.755	33 (26, 37)	0.783
Female	79	21.6 ± 1.2		9 (5.8, 11.3)		34 (26.8, 37)	
Hospital category							
Tertiary hospitals	99	21 (14, 29)	0.066	9 (6, 12)	0.213	32 (26, 37)	0.182
Nontertiary hospitals	34	17 (13, 23)		8 (5, 11)		34.5 (28, 37.3)	
Title							
Resident	82	20.7 ± 1.1	0.552	9 (5.8, 12)	0.997	34 (26, 37.3)	0.433
Other titles	51	21.7 ± 1.3		9 (5, 12)		33 (27, 37)	
Years of practice							
<5 years	65	18.2 ± 8.0	0.002	8.46 ± 4.5	0.003	33 (26.5, 37)	0.784
5–9 years	25	26.5 ± 9.9		12.6 ± 6.3		34 (28, 37.5)	
10–19 years	29	22.7 ± 10.3		8.1 ± 4.9		31 (25, 37.5)	
≥20 years	14	21.0 ± 11.2		8.4 ± 4.6		33 (27.3, 37)	
Cases of anesthesia per year							
<500	84	19.0 ± 0.9	<0.001	8 (5.3, 11)	0.220	33.5 (28, 37)	0.116
≥500	49	24.7 ± 1.6		10 (5.5, 13)		31 (25, 37)	
Frequency of overtime work							
Never-sometimes	38	17 (12, 20.3)	0.001	8 (6, 10.3)	0.243	33.5 (27.5, 37)	0.606
Frequently-everyday	95	22 (15, 29)		9 (5, 13)		32 (26, 37)	
Frequency of perceived challenging cases							
Never-sometimes	90	20.1 ± 0.9	0.096	8 (5, 11)	0.066	34 (28, 37)	0.201
Frequently-everyday	43	23.1 ± 1.7		9 (7, 13)		31 (25, 37)	
Hours of sleep							
≤6	44	22.5 ± 1.6	0.218	10.5 (7, 13)	0.027	29.4 ± 1.6	0.057
≥7	89	20.3 ± 1.0		8 (4.5, 11)		32.3 ± 0.7	
Sleep quality							
Excellent-good	68	17.7 ± 0.9	<0.0001	8 (4, 11)	0.012	33.5 (28, 37)	0.274
Fair-poor	65	24.6 ± 1.3		10 (6.5, 13)		32 (25, 37)	

Data are presented as mean ± SD or median (25% and 75% percentiles).

In an Egyptian study, 62% of participants experienced emotional exhaustion; 56% experienced depersonalization, and 58% reduced personal accomplishment.^[12] In Pakistan, a high rate of burnout was also identified in anesthesiologists. 39% of participants showed moderate-to high-level emotional exhaustion, 68.4% showed a moderate to high level of depersonalization, and 50.3% showed a moderate to high level of burnout in personal achievements.^[13] In comparison, our results were 65%, 67%, and 84% separately. In a recent Zambian survey, high emotional exhaustion was present in 66.3% of respondents, high level of depersonalization in 45% of respondents, and a high level of burnout in personal accomplishment in 23.8% of respondents.^[14] While in our study, the prevalence of a high level of the three burnout dimensions was 29%, 22%, and 43% respectively. The most notable problem among anesthesiologists in Tibet was the high prevalence of reduced personal accomplishment. The reason for this may be that Tibetan medicine is more popular and perceived as more authoritative in Tibet. Surgery and anesthesiology are relatively under-developed and lack of recognition from patients, which could affect the personal accomplishment in anesthesiologists. Raising public awareness and social status of anesthesiologists in Tibet may improve the situation.

Two similar studies were conducted in Chinese people years ago. In a multi-center, cross-sectional survey from six provinces, the prevalence of moderate to high level of burnout on emotional exhaustion, depersonalization, and personal accomplishment was 39%, 25%, and 65% respectively.^[15] However, Tibet was not included in this survey. In another regional study conducted in the Beijing–Tianjin–Hebei region of China, which was an economically developed area, the corresponding percentages were 84%, 83%, and 88%.^[6] In Tibet, anesthesiologists had a higher rate of burnout than the all-anesthesiologists average in China. Although the Chinese government has been committed to reform and optimize the healthcare system in the past decade, disequilibrium of health resources still exists among low, middle, and high-income provinces, and anesthesia would be disproportionately affected.^[8, 9] Shortage of anesthesiologists,^[16] limited career opportunities, and insufficient resources make anesthesiologists in Tibet more susceptible to burnout. Considering participants in our study were mostly native, the effects of environment and altitude were reflected in culture, economics and medical development. In our survey, the percentage of anesthesiologists with a workload of ≥ 1000

cases per year was 10%, while the percentage in the study by Li *et al.* in Beijing–Tianjin–Hebei region of China was more than 52%.^[6] Since workload is a common factor related to burnout, respondents in our survey were no more likely to experience burnout than anesthesiologists in Beijing–Tianjin–Hebei region of China.

In the present study, the possible factors associated with higher emotional exhaustion include more case-loads per year, overtime working frequency, and poor sleep quality. Anesthesiologists with less than 7 hours of sleep and poor sleep quality are prone to develop depersonalization. These results further confirmed that the influence of straining work patterns on anesthesiologists' burnout found in several studies in China and other countries.^[6, 7, 15, 17] Strained work has an inevitably negative effect on sleep quality and sleeps time. And these two factors were shown to be related to a higher level of burnout in depersonalization. Other factors including hospital category, gender, age, and title in our survey were not associated with burnout.

In our survey, we observed an association of burnout with years of experience in anesthesiology. It is known that burnout may peak during the initial stages of an anesthesiology career as a result of facing challenging situations with a lack of adequate support.^[11, 18] However, we found that anesthesiologists with 5–9 years of practice were more prone to experiencing emotional exhaustion and depersonalization compared to anesthesiologists in other age groups. The situation is quite different from that in developed countries in which residents have the highest burnout rate.^[11, 19] In China, anesthesiologists with less than five years of experience usually work under the supervision of an experienced physician. On the other hand, anesthesiologists with 5–9 years of practice are generally attending physicians facing the responsibility of patient safety and the pressure of academic promotions. In economically developed regions of China, the most vulnerable group to burnout was physicians from 30–39 years of age, and 60% of them were attending physicians.^[6]

This survey had several limitations. Firstly, the survey was confined to Tibet in China. These findings may not be generalizable to other regions. Secondly, this is a preliminary study to explore the burnout of anesthesiologists in the Tibet plateau area of China. Several potential influencing factors may be overlooked, such as parenthood, income, and alcohol consumption. We failed to perform logistic analysis to reveal factors associated with burnout. Thus, further studies on the causes

of burnout should be conducted in the future.

In conclusion, this survey suggests that more than half of anesthesiologists working in Tibet experience a moderate- to high- level of burnout in at least one of the three dimensional scales. Anesthesiologists with 5–9 years of experience are more prone to emotional exhaustion and depersonalization. Working load and sleep patterns are associated with burnout of anesthesiologists in Tibet. Efforts to decrease burnout through reducing the working load and raising the social recognition of anesthesiologists in Tibet should be considered.

Conflicts of Interest Statement

The authors declare no conflict of interest.

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中文摘要

西藏地区麻醉医师职业耗竭现状及相关因素分析

王维嘉¹，申乐^{1*}，拉巴次仁^{2*}，李晗歌³，张越伦⁴，黄宇光¹

¹ 中国医学科学院 北京协和医学院，北京协和医院¹ 麻醉科，³ 教育处，⁴ 临床研究中心，北京，100730

² 西藏自治区人民医院麻醉科，拉萨 850000

摘要

目的 职业耗竭是对工作中长期的紧张性刺激的反应，包括情绪衰竭、去人性化 and 低个人成就感 3 个维度。在独特的地域和文化特点影响下，西藏地区麻醉医师的职业耗竭情况可能不同于其他地区，但目前尚无相关研究。本研究旨在评估西藏地区麻醉医师职业耗竭现状以及相关因素。

方法 研究采用问卷调查方式，收集西藏地区麻醉医师社会人口学、工作现状相关数据，利用 Maslach 职业耗竭量表评估职业耗竭的严重程度，并分析影响职业耗竭的相关因素。

结果 2018 年 3 月至 2018 年 6 月期间，我们共收集 17 所医院 133 名麻醉医师的相关数据。研究发现中 - 高度情感衰竭、去人性化及低个人成就感发生率分别为 65.4% (95%CI, 57.0%~72.9%)、66.9% (95%CI, 58.5%~74.3%) 和 83.5% (95%CI, 76.2%~88.8%)。年手术麻醉例数 ≥ 500 例、经常加班、睡眠质量中 - 差与较高的情绪衰竭水平相关 (分别对应 $P<0.001$, $P=0.001$, $P<0.0001$)。5~9 年工作经验与较高的情感衰竭 ($P=0.002$) 和去人性化水平相关 ($P=0.003$)。

结论 在西藏地区，超过半数麻醉医师在至少一个维度上表现出中 - 高水平的职业耗竭，其中参加工作 5~9 年的麻醉医师更易出现情感衰竭和去人性化。减轻工作负担以及提高麻醉医师的社会认可度可能有助于改善西藏地区麻醉医师的职业耗竭现状。

关键词：麻醉；职业耗竭；个人成就感；西藏