

# Negative Emotional Status and Influencing Factors of Young Employees in Center of Disease Control and Prevention

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## Research Article

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# Abstract

**Objective** To investigate the status and influencing factors of negative emotions among young employees in center of disease control and prevention.

**Methods** Using the cluster sampling methods, 6099 employees aged 40 or below in center of disease control and prevention(CDC) of 32 province of China were interviewed by online questionnaire survey. The emotional conditions of anxiety and depression, and their influencing factors were analyzed.

**Results** A total of 5,353 valid questionnaires were collected with the recovery rate of 87.77%. 2,871 cases of young employees had different degrees of negative emotions at work, accounting for about 53.60%. Regression analysis showed that gender, professional title, educational level, job satisfaction, chronic diseases, daily sleep duration, average weekly overtime, physical activity time, and sugary beverage intake were the influencing factors of negative emotions( $P<0.05$ ). Male, primary and below, never working overtime and daily physical activity time more than 30 minutes were protective factors for negative emotions(OR vale were 0.79, 0.68, 0.39 and 0.63, respectively,  $P<0.05$ ). Bachelor degree or above, poor job satisfaction, chronic disease, daily sleep duration less than eight hours and drinking one to three sugary drinks a week were the risk factors for negative emotion(OR vale were 1.21, 4.32, 2.16, 2.75 and 1.20, respectively,  $P<0.05$ ).

**Conclusion** Due to the influence of work pressure, lifestyle, chronic diseases and other factors, young employees in CDC have a certain degree of negative emotions at work, which should be paid enough attention. Meanwhile, corresponding measures should be taken according to the influencing factors to reduce the occurrence of negative emotions.

## Introduction

Negative emotions such as depression and anxiety caused by workplace stress have become important factors that increase the risk of developing the disease and accelerate its progression<sup>[1]</sup>. Previous studies have found that, medical and health practitioners are more prone to occupational stress and burnout because of high workload and strained interpersonal relationship<sup>[2]</sup>. It develops further when there is no relief, developing a tendency for negative emotions in the form of anxiety and depression at work<sup>[3]</sup>. The survey on perceived stress of residents in 15 provinces of China shows that the perceived stress of adult residents is related to age, marriage, working status, income and physical activity<sup>[4]</sup>. Although studies have found the young employees in public health and disease control institutions often suffer from great work pressure, especially in the process of dealing with public health emergencies<sup>[5-6]</sup>. However, they mainly focus on status of job burnout and bad mood<sup>[7]</sup>, and there are few studies on large sample sizes of influencing factors.

The main objective of this study was to describe the current situation of negative emotions among young employees in CDC, and to analyze the influencing factors of this situation. This data can help us develop

targeted health education programs to reduce the risk of related diseases.

## Materials And Methods

### Subjects

6,099 employees aged 20 to 40 years from 32 provincial CDC were recruited to participate in this survey. The survey period was from October to November 2019. The protocols used in this study were approved by the Ethical Committee of Chinese Center for Disease Control and Prevention.

### Questionnaire design and survey methods

The questionnaire was designed by the research team based on the survey needs and previous research, and contained 72 questions from four dimensions, including basic information, ideological status, emotion and health-related behavior<sup>[8-9]</sup>, and details have been described in our previous study<sup>[10]</sup>. Negative emotions at work include depression, anxiety and irritability<sup>[11]</sup>. In the design of the questionnaire, all sensitive questions are dealt with fuzzily.

In this study, the cluster sampling method was adopted to carry out a self-made online questionnaire survey, and relevant data were collected online by "scanning two-dimensional code or logging in to the survey link". Before the survey, the investigators were trained and instructed to fill in the form online. The questionnaire data will be cleaned and coded by special personnel, and the questionnaires with inconsistent, incomplete and abnormal information will be eliminated.

### Statistical analysis

The results are presented as the mean values  $\pm$  standard deviation(SD), One-way ANOVA was used for comparisons between groups. The influencing factors were analyzed by Two-category Logistic multifactor analysis. All of the statistical analyses were performed using the Statistical Product and Service Solutions13.0 software, and significance was set to the  $\alpha=0.05$  error rate.

## Results

### Participant characteristics

A total of 5,353 valid questionnaires were included and used for statistical analysis, accounting for 87.77% of the total questionnaires. There are 1,886 cases (35.23%) males and 3,467 (64.77%) cases female. 1670 cases (31.20%) were aged between 18 and 30 years, and 3683 cases (68.80%) were aged between 31 and 40 years.

### Status distribution of negative emotions

2,871 cases had different degrees of negative emotions at work, accounting for about 53.63%, including 1958 cases of anxiety (68.20%), 429 cases of depression (14.94%), 484 cases of irritability (16.86%), shown as tab 1 and 2. The proportion of negative emotion was higher in group of 31~40 years old, female, married, post-graduate degree and intermediate professional title. As shown in Table 2, the distribution differences of different types of negative emotions among age, gender, marital status and education level are statistically significant( $P<0.05$ ), while the differences among professional titles are not statistically significant( $P>0.05$ ).

**Tab 1. Distribution of negative emotions in daily work**

	I/A		N/A	
	n	Percentage%	n	Percentage%
<b>Age(years)</b>				
18~30	904	31.49	766	30.86
31~40	1967	68.51	1716	69.14
<b>Gender</b>				
Male	983	34.24	903	36.38
Female	1888	65.76	1569	63.22
<b>Marital status</b>				
Married	2076	72.31	1831	73.77
Single	743	25.88	605	24.38
Other situations	52	1.81	46	1.85
<b>Education level</b>				
Bachelor degree or above	1207	42.04	1876	75.58
Post-graduate degree	1664	57.96	606	24.42
<b>Professional title</b>				
Primary and below	1220	42.49	1143	46.05
Intermediate	1228	42.77	985	39.69
Senior	423	14.73	354	14.26

**Tab 2. Difference of negative emotion rate under different characteristics**

	Anxiety		Depression		Irritability		F value	P value
	n	Percentage [%]	n	Percentage [%]	n	Percentage [%]		
<b>Age(years)</b>								
18~30	626	69.25	146	16.15	132	14.60	13.79	0.00
31~40	1332	67.72	283	14.39	352	17.90		
<b>Gender</b>								
Male	643	65.41	176	17.90	164	16.68	11.60	0.01
Female	1315	69.65	253	13.40	320	16.95		
<b>Marital status</b>								
Married	1440	69.36	265	12.76	371	17.87	43.81	0.00
Single	489	65.81	153	20.59	101	13.59		
Other situations	29	55.77	11	21.15	12	23.08		
<b>Education level</b>								
Bachelor degree or above	745	61.72	190	15.74	272	22.54	53.63	0.00
Post-graduate degree	1213	72.90	239	14.36	212	12.74		
<b>Professional title</b>								
Primary and below	814	66.72	196	16.07	210	17.21	8.93	0.18
Intermediate	831	67.67	182	14.82	215	17.51		
Senior	313	74.00	51	12.06	59	13.95		

### Analysis results of influencing factors

Regression analysis showed that gender, professional title, educational level, job satisfaction, chronic diseases, daily sleep duration, average weekly overtime, physical activity time, and sugary beverage intake were the influencing factors of negative emotions ( $P < 0.05$ ). Male, primary and below, never working overtime and daily physical activity time more than 30 minutes were protective factors for negative emotions (OR value were 0.79, 0.68, 0.39 and 0.63, respectively,  $P < 0.05$ ). Bachelor degree or above, poor job satisfaction, chronic disease, daily sleep duration less than eight hours and drinking one to three sugary

drinks a week were the risk factors for negative emotion(OR vale were1.21, 4.32, 2.16, 2.75 and 1.20, respectively,  $P<0.05$ ), as shown in Table 3.

**Table 3. Multiple regression analysis of influencing factors of negative emotion**

Variable	R value	P value	OR	95%CI	
				Lower limits	Upper
<b>Intercept</b>	0.96	0.03	2.62	1.09	6.25
<b>Age(years)</b>					
18~30	0.17	0.17	1.18	0.93	1.49
31~40	0	-	1	-	-
<b>Gender</b>					
Male	-0.23	0.01	0.79	0.67	0.94
Female	0	-	1	-	-
<b>Education level</b>					
Bachelor degree or above	0.19	0.03	1.21	1.01	1.45
Post-graduate degree	0	-	1	-	-
<b>Department</b>					
Technical section	0.25	0.18	1.28	0.89	1.85
Administrative section	0.15	0.45	1.16	0.78	1.73
Others	0	-	1	-	-
<b>Professional title</b>					
Primary and below	-0.39	0.01	0.68	0.51	0.91
Intermediate	0.18	0.19	1.20	0.92	1.57
Senior	0	-	1	-	-
<b>Marital status</b>					
Married	0.27	0.38	1.30	0.72	2.35
Single	0.18	0.56	1.20	0.65	2.23
Other situations	0	-	1	-	-
<b>Job satisfaction</b>					
Dissatisfaction	1.46	0.00	4.32	2.73	6.86
Ordinary	0.87	0.00	2.39	1.94	2.95
Satisfaction	0	-	1	-	-
<b>Chronic disease</b>					

I/A	0.77	0.00	2.16	1.72	2.70
N/A	0	-	1	-	-
<b>Sleep duration</b>					
≤6h per day	1.01	0.00	2.75	1.86	4.06
7h per day	0.55	0.00	1.74	1.21	2.49
≥8h per day	0	-	1	-	-
<b>Average overtime</b>					
Never	-0.93	0.00	0.39	0.27	0.58
0~10h per week	-0.24	0.21	0.78	0.53	1.15
≥10h per week	0	-	1	-	-
<b>Physical activity time</b>					
≤30 min per day	-0.24	0.06	0.79	0.63	0.98
≥30 min per day	-0.46	0.00	0.63	0.51	0.79
Never	0	-	1	-	-
<b>Sugary drink intake</b>					
1~3 bottle per week	0.18	0.04	1.20	1.01	1.43
≥4 bottle per week	0.13	0.44	1.14	0.82	1.57
Never	0	-	1	-	-

## Discussion

Due to the nature of medical and health work, practitioners suffer from a high level of work stress and psychological stress, many studies have shown that long-term high-load work can easily cause negative emotions and increase the risk of depression and chronic diseases<sup>[7,12-13]</sup>. CDC is the primary agency for dealing with public health emergencies, especially SAS, avian influenza and COVID-19<sup>[14]</sup>, in which young people are the main force. Therefore, paying attention to the physical and mental health of young practitioners is not only of great significance to individuals, but also to the overall quality of disease control.

Previous studies have found that during the COVID-19 pandemic, the proportion of employees in CDC with anxiety was 33.87% and that of with depression was 38.88%<sup>[15]</sup>. In this study, we found that the proportion of anxiety and other negative emotions among young practitioners was 53.60%, slightly lower than the results above, suggesting that the high workload brought by the epidemic increased the occurrence of negative emotions. Our study also found that the female employees have a higher



proportion of negative situations, reaching 68.51%, which is basically consistent with the result (63.0%) obtained by Qiu Qianwen et al in 2020<sup>[7]</sup>. Walter Wurm et al.<sup>[16]</sup> in 2016 also found this phenomenon and believed that compared with men, women's physical and mental health were more easily affected by the environment, so they were more prone to negative emotions.

In a survey of 1344 employees from four coal mines in Xinjiang, Xian Tingyong et al<sup>[17]</sup>. found that weekly working hours, positions and duties were significant factors contributing to increased occupational stress among practitioners. Our study also found that those who often work overtime are more likely to have negative emotions than those who never work overtime. This may be related to the fact that overtime takes up more spare time and young people are unable to obtain psychological relaxation from leisure time<sup>[18]</sup>. At the same time, the study found that physical activity of 30 minutes or more per day was a protective factor against negative emotions compared with those who did not exercise and those who rarely exercised. Huggles CW et al<sup>[19]</sup>. observed 30 teenagers with major depression who experienced significant relief after 12 weeks of intense exercise. A survey of Health risks in 2014 also found that regular exercise reduced the incidence of depression in young people<sup>[20]</sup>.

On the other hand, this study found that poor job satisfaction and daily sleep duration less than eight hours were risk factors for negative emotions. People with poor job satisfaction were more likely to experience negative emotions than those with higher job satisfaction, which may be related to complaining more about their jobs. Previous studies have found that the higher the occupational self-concept and dedication, the lower the incidence of occupational burnout<sup>[7]</sup>. Because stress comes from work overload and the inability to juggle work and family, people with high job satisfaction are more likely to find a balance and put more energy into their work.

Studies have found an association between the quality and duration of sleep and depression<sup>[21]</sup>. Healthy China Initiative (2019-2030) calls for mental health promotion actions to slow the rise of insomnia, anxiety and depression, and advocate getting 7-8 hours of sleep a day<sup>[4]</sup>. Li Yinghua et al. conducted a study on the relationship between work status and depression among occupational population in Beijing and found that people with average or poor sleep quality had a greater risk of depression than those with good sleep quality, and people with good sleep quality had a lower incidence of depression<sup>[22]</sup>. In this study, it was also found that people who slept more than 8 hours had a lower proportion of negative emotions, suggesting that lack of sleep was a risk factor. However, lack of sleep among CDC employees was also associated with heavier workloads and frequent overtime. Therefore, to address these problems fundamentally, consideration should be given to reducing the workload of young practitioners.

## Conclusion

There may be some bias in this study due to the influence of sample size, which may affect the accuracy and credibility of the results. Despite some limitations, our findings still represent a significant step

forward, especially for finding out the possible influencing factors, and then put forward targeted solutions.

## Declarations

**Ethics approval and consent to participate** All methods are implemented in accordance with relevant guidelines and regulations. All experimental protocols were approved by the designated licensing Committee (Ethics Committee of China Center for Disease Control and Prevention). Informed consent was obtained from all subjects.

**Consent for publication** Not applicable.

**Availability of data and materials** The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

**Competing interests** The authors declare that they have no conflict of interest.

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**Authors' contributions** HL is the first author. ZY initiated the concepts of the study. LT, LQ and NR collected the data. LT, LQ, and NR analyzed the data. HL drafted the manuscript. ZY contributed to the interpretation of the results and critical revision of the manuscript for important intellectual content and approved the final version of the manuscript. LQ, LT, NR, WQ, and ZL reviews and suggests the manuscript. All authors have read and approved the final manuscript. HL and ZY are the study guarantors.

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