

Study on Accurate Grouping of Job Burnout of Police in Kham Tibetan Areas of Sichuan Province Based on K-means Clustering Analysis

Jing Ye^{1,*}, Zhaoming Song²

¹Sichuan Vocational College of Chemical Technology, Luzhou, Sichuan 646000, China

²Sichuan Police College, Luzhou, Sichuan, 646000, China

*Corresponding author

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Abstract: Paying attention to the particularity of job burnout and carrying out accurate identification and intervention can help the administrative department to identify the high-risk group at an early stage and provide empirical evidence for the formulation of personalized assistance plan. This research adopts k-means cluster analysis to study the job burnout degree of 431 policemen in Kham Tibetan Areas of Sichuan Province, and analyzes the population index of the research results. The conclusion is of reference value for realizing accurate identification and positioning for the intervention of the police job burnout. It is of great theoretical and practical significance to take corresponding measures to identify the degree of job burnout of the police, and effectively interdict the deterioration of job burnout.

1. Introduction

Job burnout is one of the important factors that affect the work efficiency and the public credibility of law enforcement for the public security organ. The higher the degree of job burnout is, the greater the negative impact on the society will be, which will ultimately affect the social stability [1]. As one of the three major dialects areas of Tibetan language, Kham Tibetan Areas of Sichuan Province is a unique unit of human geography in Qinghai-Tibet Plateau. It plays a unique typical role and value in promoting the relationship between Han and Tibetan nationalities, eliminating estrangement and enhancing closeness [2]. However, it is because of its special humanistic environment that makes its work more sensitive, complicated and special, thus it is more likely to cause work fatigue for the police. Therefore, this paper makes an in-depth study on the job burnout of the special group of police in Kham Tibetan Areas, Sichuan, and classifies it scientifically according to the degree and type of job burnout of different groups, and formulates the intervention of "varying with each individuals", so as to achieve the accurate intervention strategy and improve the whole combat ability of the team.

Previous studies have shown that the policemen in Kham Tibetan Areas of Sichuan Province shown job burnout in different degrees in terms of emotional exhaustion, job alienation and task performance [1]. Job burnout will not only negatively affect the physical and mental health of

employees, but also affect the quality and performance of the work to a certain extent [3]. Therefore, it is important to identify the influencing factors of job burnout in high-risk groups at an early stage. This study uses cluster analysis method to conduct a characteristic analysis of the job burnout for the representative group of the police in Kham Tibetan Areas of Sichuan Province, looking forward to provide a reference for the administrative department to identify the potential high-risk group at an early stage, and to provide an empirical evidence for formulating individualized assistance plans for different job burnout characteristics.

2. Object and Method

2.1. Objects

The data used in this paper comes from a questionnaire survey on the relevant indicators of job burnout status of 431 policemen in Kham Tibetan Areas, Sichuan Province.

2.2. Method

Using R language, the number of clusters is initially determined by `fviz_nbclust` function, and then k-means cluster analysis is conducted to cluster the policemen with different degree of burnout.

3. Results

3.1. Cluster Analysis Results

The `fviz_nbclust` function is first used to create a constrained graph between the number of clusters and the overall quadratic sum to determine the optimal number of clusters (see Figure. 1).

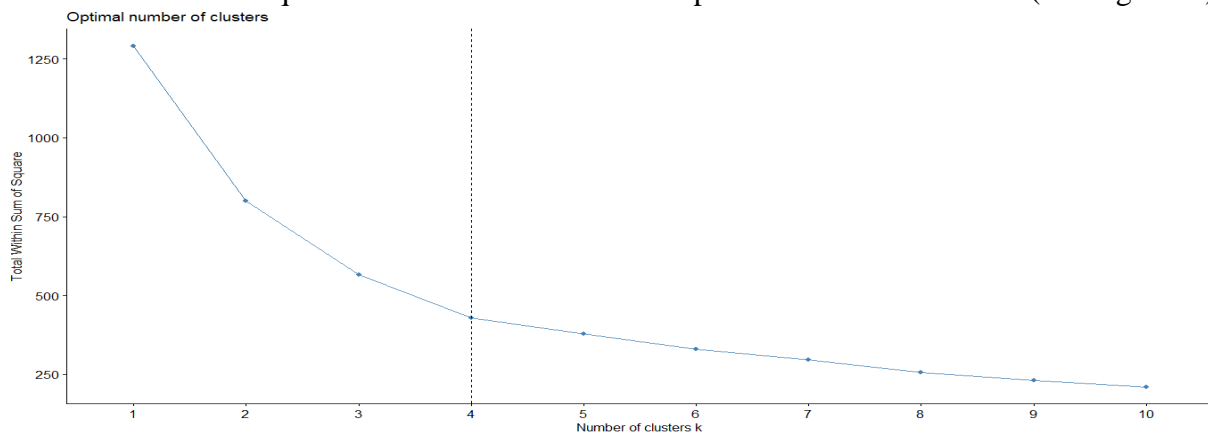


Figure 1: The constrained graph between the number of clusters and the overall quadratic sum

Figure 1 shows that the curve tends to flatten out at $K=4$ nodes, so the optimal cluster can be selected as Cluster 4. The K-means clustering algorithm is used for clustering. The results are as shown in Table 1, which together reflect the final clustering center of the 4 clusters and the number of cases in each cluster.

Table 1: K-means merged clustering results of job burnout data field

Marks of Cluster	Final clustering center			Number of cases	Cluster Name
	Emotional exhaustion	Job alienation	Task Performance		
Cluster1	17.00	19.84	12.55	58	High burnout and low performance group
Cluster2	9.81	8.42	11.06	130	Low burnout and low performance group
Cluster3	7.13	5.54	18.92	154	Low burnout and high performance group
Cluster4	15.46	9.91	18.98	89	High burnout and high performance group
Total	10.99	9.24	15.71	431	

In Cluster 1, 58 data points account for 13%, which are characterized by high emotional exhaustion, high work alienation and low task performance, which can be defined as High burnout and Low performance group. This kind of group has a strong sense of job burnout, which has seriously affected all aspects of their work and is the key cluster focused by administrative department. We should strengthen the organization intervention to relieve the pressure of dredging in time, and shall take concrete practice with different individuals and problems.

In Cluster 2, 130 data points account for 30%, which are characterized by low emotional exhaustion, low work alienation and low task performance as the Low burnout and Low performance group. This kind of group has negative working attitude, low task performance, which is in a kind of flat status. The administrative departments should strengthen their work discipline consciousness and curb their free and loose work attitude.

In Cluster 3, 154 data points account for 36%, which are characterized by low emotional exhaustion, low work alienation and high task performance, and it can be defined as a low burnout and high performance group. This kind of group works actively and has high task performance. The administrative department should make use of relevant policies to actively guide them to maintain high work enthusiasm and performance.

In Cluster 4, 89 data points account for 21%, characterized by high emotional exhaustion and high task performance. It can be defined as a high exhaustion and high performance group. When a person's stress builds up over the years and can't be relieved, the stress would turn into the opposite force of behavior. The administrative department should pay attention to the adjustment of the individual emotion, cognition and other psychological resources of the policemen, so as to prevent the police from having the feeling of being exhausted by the work.

3.2 Demographic Index Analysis of Each Cluster

Choose the index of job burnout, quantify the different degree of job burnout among the police, and grade the police accordingly. The grading index system is shown in Table 2.

3.2.1. Gender Analysis

Table 3 shows that in Cluster 2 (low burnout and low performance group), women were significantly higher than men in terms of emotional exhaustion ($P < 0.05$). Therefore, compared with male, the administrative department should pay more attention to women's response to work stress.

Table 2: Classification index system of job burnout population

Grading index	Statement	Assignment
Gender	Male	Male=1
	Female	Female=2
Length in police	5 years and below	5 years and below=1
	10 years and below	10 years and below=2
	More than 10 years	More than 10 years=3
Marital status	Unmarried	Unmarried=1
	Married	Married=2
	Divorce	Divorce=3
Education level	Below junior college	Below junior college =1
	Junior College and above	Junior College and above =2
Police classification	Security police	Security=1
	Criminal investigation	Criminal investigation=2
	Traffic police	Traffic police=3
	Special Weapon And Tactics	SWAT=4
	Comprehensive law enforcement	Comprehensive=5

Table 3: Comparison and analysis of job burnout by different gender and cluster

Cluster	Indicator	Emotional exhaustion		Job alienation		Task performance	
		Male	Female	Male	Female	Male	Female
Cluster1	N	48	10	48	10	48	10
	Mean value	17.27	15.70	19.73	20.40	12.67	12.00
Cluster2	N	135	19	135	19	135	19
	Mean value	6.95*	8.42*	5.47	6.00	18.89	19.16
Cluster3	N	110	20	110	20	110	20
	Mean value	9.93	9.15	8.43	8.40	10.91	11.90
Cluster4	N	79	10	79	10	79	10
	Mean value	15.48	15.30	9.84	10.50	18.96	19.10

Note:*indicates $P < 0.05$

3.2.2. Analysis of Length in Police

Table 4 shows that the Cluster 3(low burnout and high performance group) is significantly lower than that of the police with shorter police time (5 years and below) in terms of emotional exhaustion. In terms of job alienation, the police with shorter police time (5 years and less) is significantly lower than the police with longer police time (10 years)($P < 0.05$). Therefore, police service time is an important influencing factor for emotional exhaustion and job alienation. The administrative departments should pay more attention to the two aspects of emotional exhaustion and job alienation of the long-term police officers.

Table 4: Comparison and analysis of job burnout by different police service time and cluster

Cluster	Indicator	Emotional exhaustion			Job alienation			Task performance		
		1	2	3	1	2	3	1	2	3
Cluster1	N	18	33	7	18	33	7	18	33	7
	Mean value	16.61	17.27	16.71	18.61	20.58	19.57	13.28	12.15	12.57
Cluster2	N	32	78	20	32	78	20	32	78	20
	Mean value	9.53	9.92	9.80	7.94	8.79	7.75	11.56	10.86	11.05
Cluster3	N	57	81	16	57	81	16	57	81	16
	Mean value	6.32*※	7.42*	8.56※	5.19※	5.59	6.50※	19.33	18.60	19.06
Cluster4	N	24	54	11	24	54	11	24	54	11
	Mean value	15.13	15.44	16.27	10.13	10.00	9.00	18.96	18.93	19.27

Note:*indicates 1(5 years and below) and 2(10 years and below), $P<0.05$; ※ indicates 2 and 3, $P<0.05$;

3.2.3. Marital Status

Table 5 shows that in Cluster4(high exhaustion and high performance group), unmarried police officers were significantly lower than married police officers in terms of emotional exhaustion ($P<0.05$); in low burnout and low performance group, unmarried police officers were significantly lower than married police officers in terms of job alienation ($P<0.05$). Therefore, the emotional exhaustion and job alienation of married police officers are the important influencing factors of their job burnout. When facing the two groups of people, the administrative department should pay more attention to the two aspects of emotional exhaustion and job alienation.

Table 5: Comparison and analysis of job burnout by different marital status and clusters

Cluster	Indicator	Emotional exhaustion		Job alienation		Task performance	
		Unmarried	Married	Unmarried	Married	Unmarried	Married
Cluster1	N	14	44	14	44	14	44
	Mean value	17.21	16.93	18.21	20.36	13.71	12.18
Cluster2	N	20	110	20	110	20	110
	Mean value	9.40	9.88	7.05*	8.67*	11.00	11.07
Cluster3	N	41	113	41	113	41	113
	Mean value	6.66	7.30	5.29	5.63	19.17	18.83
Cluster4	N	25	64	25	64	25	64
	Mean value	14.08*	16.00*	10.64	9.63	19.00	18.97

Note:*indicates the comparison between unmarried and married $P<0.05$

3.2.4. Education Level

Table 6 shows that in terms of task performance of Cluster 2(low burnout and low performance group), the policemen with lower educational degree are significantly lower than those with higher educational degree ($P<0.05$); in the aspect of emotional exhaustion of Cluster 4(high burnout and high performance group), the policemen with lower educational degree are significantly lower than those with higher educational degree ($P<0.05$). Therefore, when facing the two groups, the administrative department should, on the one hand, pay more attention to the task performance of the policemen with lower education background, give more professional training opportunities and

improve their work ability, while the police with higher education should correctly guide their anxiety to work and reduce their excessive emotional exhaustion.

Table 6: Comparison and analysis of job burnout by different education level and clusters

Cluster	Indicator	Emotional exhaustion		Job alienation		Working efficiency	
		Below junior college	Junior College and above	Below junior college	Junior College and above	Below junior college	College and above
Cluster 1	N	5	53	5	53	5	53
	Mean value	15.40	17.15	21.80	19.66	14.20	12.40
Cluster 2	N	12	118	12	118	12	118
	Mean value	8.67	9.92	6.83	8.58	9.50*	11.22*
Cluster 3	N	14	140	14	140	14	140
	Mean value	6.36	7.21	4.93	5.60	17.93	19.02
Cluster 4	N	7	82	7	82	7	82
	Mean value	13.14*	15.66*	10.57	9.85	20.29	18.87

Note: *indicates that below junior college compared with junior college and above $P < 0.05$

3.2.5. Police Classification

Table 7: Comparison and analysis of job burnout by different police classification and clusters

Cluster	Category	Indicator	Security	Criminal investigation	Traffic police	SWAT	Comprehensive
Cluster 2	Emotional exhaustion	N	39	18	6	9	58
		Mean value	9.38	8.83	10.00	9.78	10.38
	Job alienation	N	39	18	6	9	58
		Mean value	8.26	7.89	10.50	8.56	8.47
	Task performance	N	39	18	6	9	58
		Mean value	10.79	11.00	11.83	11.22	11.16
Cluster 3	Emotional exhaustion	N	44	18	11	16	65
		Mean value	6.50	7.78	7.00	7.00	7.43
	Job alienation	N	44	18	11	16	65
		Mean value	5.52	5.39	5.64	4.88	5.74
	Task performance	N	44	18	11	16	65
		Mean value	18.80	19.17	18.55	19.19	18.94
Cluster 4	Emotional exhaustion	N	27	11	6	3	42
		Mean value	15.96	16.09	13.67	12.00	15.48
	Job alienation	N	27	11	6	3	42
		value	11.22*	7.27*	9.67	8.33	9.90
	Task performance	N	27	11	6	3	42
		Mean value	18.44	19.73	18.83	20.00	19.07

Note: *indicates the comparison between public security and criminal investigation ($P < 0.05$).

Table 7 shows that the police in criminal investigation category are significantly lower than those in security category in terms of job alienation in Cluster 4 ($P < 0.05$). Therefore, when facing this group of people, the administrative department should, on the one hand, pay more attention to

the situation that the police of the security class are alienated from their work, and give more positive guidance to reduce their excessive work alienation.

4. Analysis and Discussion

In this study, four types of job burnout of the policemen in Kham Tibetan Areas of Sichuan Province were obtained; each type has relatively high heterogeneity with each other. Among them, Cluster1 group with high burnout and low performance accounts for 13% of the effective samples, Cluster2 group with low burnout and low performance accounts for 30% of the effective samples, Cluster3 group with low burnout and high performance accounts for 36% of the effective samples, and Cluster4 group with high burnout and high performance accounts for 21% of the effective samples. In Cluster1 group, the values of emotional exhaustion and job alienation were higher than the average value, and the values in task performance were lower than the average value. Therefore, only 13% of the police officers were in a negative state in emotion, mood, work attitude, work behavior and self-cognition. Generally speaking, the overall degree of job burnout in Kham Tibetan Areas of Sichuan Province for the police is not high, and the overall performance level of work still needs to be improved.

Besides, different characteristics of the job burnout of the police have structural heterogeneity. First, in the low burnout and low performance group, females were significantly higher than males in terms of emotional exhaustion. This may have something to do with the fact that families make fewer demands on males and have clearer work-home boundaries than females. Males invest relatively less in family life and the family is less disruptive to work, while females' expectations and responsibilities for the family are increasing, which makes them devote a lot of energy to the family at the same time. As a result, policewomen are more physically and mentally exhausted than policemen. Second, the police with shorter police service time present a lower level of burnout. In terms of emotional exhaustion, the police with shorter police service time are significantly lower than those with longer police service time. This may be because he just joined the police force, full of vision for work, actively engaged in the task, but as time goes on, this kind of burnout will emerge imperceptibly [4]. Moreover, the police with shorter police service time (5 years and below) are significantly lower than those with longer police service (more than 10 years) in terms of emotional exhaustion. Some of the police who have been in police for a long time (10 years or more) are between 40 and 50 years of age, and may be facing a "middle-aged crisis", and their fatigue is aggravated by professional ceiling and family pressure [5]. Thirdly, in the high exhaustion and high performance group, the unmarried police in the emotional exhaustion are significantly lower than the married police. This may be related to the common separation of the husband and wife in Kham Tibetan Areas of Sichuan Province. In recent years, the police station in Kham Tibetan Areas has recruited a large number of non-native police, which objectively increases the number of separated couples from the two places. Meanwhile, because of the remote areas with an average altitude of 4,000m, such as Shiqu, Dege and Sertar, the natural conditions are more difficult, which will inevitably lead to conflict between work, family and marriage [6]. Fourthly, the distribution of the police with different educational background in the type of burnout also presents unique characteristics. At the same time, the high-educated police in the group of high burnout and high performance may be because of their higher sense of responsibility and higher expectation of work, which makes them more likely to show the state of physical and mental exhaustion. Some studies have also shown that the persons with higher educational degree have higher self-positioning and self-value expectation than those with lower educational degree, so they are more prominent in the aspects of emotional exhaustion and depersonalization [7]. Fifth, the work of the security police in Kham Tibetan Areas of Sichuan Province is obviously higher than that of the criminal investigation.

Police of public security and criminal investigation both need high performance. Facing the pressure of work, the task of public security is more small and trivial than those of criminal investigation, and need to contact with the masses more directly. While in the process of law enforcement, the police of public security often encounter behaviors that hinder the enforcement of the law, such as disturbing the police, attacking the police and making malicious complaints. Moreover, the serious shortage of police force is formed due to the language and highly dispersed population structure, which also makes some policemen fear and dare to enforce the law. And cause a decline in professional honor.

5. Conclusions and Suggestions

5.1. Conclusions

(1) The overall level of job burnout of the police in Kham Tibetan Areas of Sichuan Province is relatively low, but the overall task performance needs to be further improved.

(2) In this study, four types of job burnout groups were found, namely, Cluster1 group with high burnout and low performance, Cluster2 with low burnout and low performance, Cluster3 with low burnout and high performance, Cluster4 with high burnout and high performance.

(3) The analysis of each cluster demographic index shows that in Cluster2 (low burnout and low performance group), in terms of emotional exhaustion, females are significantly higher than males in terms of emotional exhaustion, in terms of task performance, police with lower education background are significantly lower than those with higher education background, and in terms of job alienation, unmarried police officers are significantly lower than married police officers; in terms of emotional exhaustion, Cluster3(low burnout and high performance group) is significantly lower in terms of emotional exhaustion than those in long-term police service, and in terms of job alienation, police with shorter police time (5 years and less) are significantly lower than those with longer police time (10 years). In terms of emotional exhaustion in Cluster4(high exhaustion and high performance group), unmarried police officers are significantly lower than married police officers, and those with lower education background are significantly lower than those with higher education degree. In terms of job alienation, the police in the criminal investigation category are significantly lower than those in the public security category.

5.2. Suggestions

The administrative department should flexibly take corresponding intervention measures according to the characteristics of different civilian police groups. Among them, the group with high burnout and low efficacy is the group that needs attention most. On the one hand, the political and industrial department should actively study the causes of this situation and communicate with each other in various forms and ways to guide their negative emotions, and at the same time guide them to adjust their working methods and pressures to make positive changes.

References

- [1] Song Zhaoming, Ye Jing, Yang Jun, Zhou Yao. *Police Job Burnout in Ganzi Tibetan Area. Journal of Sichuan Police College*, 2019, 31(03): 16-27.
- [2] Liu Zhihan and Shi Shuo. *Cultural Consciousness and Upholding the Consciousness of Chinese Nation's Community-The Enlightenment of Modern Han-Tibetan Culture Blending on the Building of Chinese Nation's Consciousness of Chinese Community in Kham Tibetan Areas. North West Ethno-national Studies*, 2022(03):5-16.

- [3] Mohammad R A, Jones A M, Clark J S. Changing patterns of the prevalence of burnout and secondary traumatic stress in health-system pharmacists throughout the COVID-19 pandemic. *Journal of the American College of Clinical Pharmacy*, 2022(7):5.
- [4] Gan Yong, Yang Tingting, Yang Yudi, Liu Jianxin, Wang Chao, Li Liqing and Lu Zuxun. Job Burnout and Its Influencing Factors among General Practitioners in Eastern, Central and Western China. *Medicine and Society*, 2020, 33(03): 99-103.
- [5] Yan Guangcai. *The Career of the Faculty at Midlife: Representation and Stuckness*. *Educational Research*, 2020, 41(07):95-108.
- [6] Tang Kailin and Wang Yan. *An Empirical Study on the Contemporary Marriage and Family Conflicts and Countermeasures*. *Studies in Ethics*, 2019(06): 130-138.
- [7] Zhao Jinjin and Liu Bo. *The Curvilinear Relation between Workplace Ostracism and Job Burnout of Knowledge-Oriented Staffs: Moderating Effects of Psychological Empowerment and Collectivistic Orientation*. *Modern Finance and Economics (Journal of Tianjin University of Finance and Economics)*, 2019, 39(03): 101-113.