

ORIGINAL ARTICLE

Development and validation of police mental health ability scale

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Abstract

Objectives: Police officers are generally under long-term occupational stress. Good mental health ability enables them to better deal with emergencies and enhance their combat effectiveness. We aimed to develop the Police Mental Health Ability Scale (PMHAS) to provide a reference for police selection and ability training.

Methods: Through literature analysis, individual interviews, half-open and half-closed questionnaire surveys, and expert consultations, the components of police mental health ability (PMHA) were theoretically constructed. Then, we enrolled 824 in-service police officers who participated in the training in Chongqing City and Sichuan Province from November 2018 to January 2019 and recovered 767 valid questionnaires (recovery rate, 93.08%).

Results: Exploratory factor analysis generated five factors for PMHAS, including cognitive intelligence, emotional catharsis, swift decisiveness, behavioral drive, and reward pursuit, accounting for 58.904% of the variance. Confirmatory factor analysis demonstrated that the model fit well ($\chi^2/df = 1.117$, RMSEA = 0.020, GFI = 0.948, CFI = 0.990, IFI = 0.990, TLI = 0.987). The correlation coefficients of factors ($r = -0.023 \sim 0.580$) were lower than that of each factor and total score ($r = 0.477 \sim 0.819$). The Cronbach's α coefficients of PMHAS and its factors were 0.606–0.863, and the test–retest reliabilities were 0.602–0.732.

Conclusion: These results suggest that PMHAS is reliable and valid enough for measuring PMHA, which shows that it is a potentially valuable tool for assessing the mental health ability of police officers.

KEYWORDS

mental health ability, police, psychological evaluation, reliability, validity

Chengju Liao and Xingmei Gu contributed equally to this work.

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1 | INTRODUCTION

Police officers are under increasing pressure of ensuring national security and maintaining social order. Generally being under long-term occupational stress, they are prone to psychological subhealth conditions such as anxiety, depression, hostility, paranoia, and burnout.^{1–5} A previous study found that in the face of a complex stressful environment, they deal with stress in different ways.⁶ For police officers with good mental health ability and positive psychological capital,⁷ they can adapt well or recover quickly by coping with stress in a positive, optimistic, calm, and decisive way through psychological disengagement and other methods,^{8,9} showing amazing combat effectiveness. Whereas, for some police officers with poor mental health ability, when encountering emergencies or major accidents, they may have a cognitive bias against suspects' guilt and are more inclined to use violence to treat the people due to bad psychological conditions,^{10–14} causing loss of trust in police and harsh relationship between police and community and other severe consequences.¹⁵ This is like a time bomb that may have a serious impact on the construction of the police force as well as social security and stability. Therefore, the study of police mental health ability (PMHA) plays an important role in promoting their mental health status and enhancing their combat effectiveness.

1.1 | The concept and components of mental health ability

There are different academic points of view on the concept and components of mental health ability. Some advocate the theory of general mental abilities¹⁶ and propose that mental health ability is a primary cognitive ability composed of perceptual speed, memory span, semantic comprehension, verbal fluency, calculation, and reasoning from the perspective of intelligence. Some believe that mental health ability refers to the ability to learn and develop, conduct interpersonal communication, obtain happiness, carry out psychological adjustment, and monitor one's own behavior,¹⁷ which are formed in the process of learning and adaptation. Some emphasize that mental health ability is a kind of antifrustration ability, that is, when individuals face stress and challenges, their own personality characteristics and advantages can provide effective psychological resources to cope with stress, including frustration tolerance, resilience, strong will, etc., which are essential for alleviating psychological tension.^{18,19} What's more, some believe that mental health ability is a kind of psychosocial ability, which refers to the comprehensive ability of people to

effectively communicate with their social surroundings and adapt to social changes, including social affection, psychological transposition, tolerance, cooperation, self-control, self-evaluation, and adaptation to social changes and development.^{20–22} The definitional confusion of the concept and components of mental health ability has implications for the way it is measured. In spite of these differences, a consensus basically has been reached that mental health ability is a comprehensive ability manifested in the process of psychological adaptation such as cognition, emotion, consciousness, and behavior.

1.2 | The measures of mental health ability among special occupational groups

As the study continues, researchers are inclined to investigate the mental health ability of special occupational groups. A theoretical evaluation model of military mental health ability was proposed, which consists of three dimensions: mental status, mental ability, and mental quality.²³ Mental status is a relatively stable and continuous state of mental activities, such as cognition, emotion, and will, over a period of time. It is not last and changes with different external environmental stimuli. Its emotional and behavioral manifestations include fear, anxiety, depression, sleep quality and diet, posttraumatic stress responses, etc.²⁴ Mental ability refers to the internal cognitive, emotional regulation, and will control ability required to engage in certain mental activities, including adaptability, emotional regulation, and posttraumatic growth.²⁵ Adaptability is the ability to adapt to the external environment, and it is a comprehensive reflection of individuals' physical strength, intelligence, coping style and personality and temperament, predicting engagement, job satisfaction, burnout, and workaholism. Emotion regulation can improve the subjective experience and physiological response by effectively changing the generation and development of individual emotions, and thus is essential for physical and mental health.²⁶ Posttraumatic growth capacity is an individual's ability to change positively after experiencing traumatic events, and it is manifested in changes in self-awareness, interpersonal experiences, basic notions about life, etc.²⁷ Mental quality is the most fundamental and stable inner psychological trait, including intelligence, loyalty, bravery, self-confidence, resilience, etc. Based on the theory above, a study of 7590 participants was conducted and the Mental Health Ability Questionnaire for Army men (MHAQA) was developed.²⁸ They believe that military mental health ability refers to the ability of soldiers to actively regulate internal psychology and external behavior to maintain mental health when responding to different challenges

in the three stages of adaptation, balance, and development in military settings, including seven components: willpower, behavior inhibition, emotional catharsis, emotional cognition, emotional control, behavioral drive, and reward pursuit. Exploratory factor analysis demonstrated that the seven factors are consistent with the prefabricated concept and items, accounting for 49.168% of the variance; Confirmatory factor analysis showed that the 7-factor scale fit well ($\chi^2/df = 8.848$, RMSEA = 0.045, GFI = 0.923, CFI = 0.855, NFI = 0.840), suggesting that the construct of MHAQA is reasonable. Therefore, MHAQA is a psychometrically sound measure of military mental health ability, which provides a reference for the study of the mental health ability of police officers.

When it comes to police officers, Bao developed the Police Psychological Quality Scale (PPQS),²⁹ and she believed that police mental ability refers to police officers' ability in cognition and psychological adaptation, which is the comprehensive ability to get rid of mental stress and better cope with work and life, including five components of self-confidence, strength, responsibility, justice, and gratitude. Police officers with psychological abilities, such as professional attitudes, ethics, and doctrine, can cope with occupational stress well. Although Bao began to pay attention to the components of the mental health ability of police officers and has developed a scale, the police psychological ability they proposed more likely refers to a stable and intrinsic professional psychological quality formed over a long time, focusing on the basic mental quality required to engage in the police profession. Actually, compared with professional psychological quality, mental health ability is much more flexible and changeable. In a study of traffic police, Jin et al. proposed that mental health ability is the basic, flexible mental ability and psycho-behavioral capacity, including cognitive judgment, emotional control, and willpower.³⁰

Therefore, we believe that PMHA refers to a series of psychological adaptation abilities displayed by police officers during law enforcement. It is based on their psychological quality to a certain degree, but more importantly, it emphasizes the dynamic psychological characteristics reflected in their cognition, emotion, willpower, motivation, and other aspects when dealing with stress, frustration, and other adverse events.

1.3 | Current study

At present, studies on PMHA are a primarily theoretical exploration of its concept and components, few empirical studies involve interviews and the development of questionnaires based on relevant theories. There are theoretical, psychometric, and practical limitations of PPQS in

evaluating mental health ability in police groups, as Bao paid more attention to the stable and intrinsic professional psychological quality, instead of the flexible and changeable mental health ability. Since there are some commonalities in the concept and components of military mental health ability and police mental health ability, MHAQA can be used as a reference for the development of PMHAS. Therefore, in this empirical study, we analyzed the components of PMHA, developed PMHAS, and conducted exploratory factor analysis, confirmatory factor analysis, and reliability analysis to verify the validity of the scale, so as to establish a scientific and effective evaluation tool, providing reference for the selection of police officers and their ability training.

2 | METHODS

2.1 | Participants and procedures

From November 2018 to January 2019, we enrolled 824 in-service police officers who participated in the training in Chongqing City and Sichuan Province. To control the quality/validity of the data collected, two postgraduates who majored in psychology were trained to complete the field investigation. Excluding questionnaires with incomplete answers or personal information, we recovered 767 valid questionnaires. Among these questionnaires, 475 in the first recruitment were used to conduct exploratory factor analysis (EFA), and 292 in the second one were used to conduct confirmatory factor analysis (CFA). Participants in the final sample were aged between 19 and 56 years (M age 29.46 years, SD = 7.75) and 85% were male. After an interval of 26 days, 154 of them were retested, and 128 valid questionnaires were recovered to determine the test-retest reliability of the scale. At the same time, they also completed PPQS to determine the criterion validity of the scale. This study was approved by the principal of Sanjiang Civilian Police Training Base and written informed consent was obtained from all the participants. The data sets acquired and/or analyzed during the current study are available from the corresponding author upon reasonable request.

2.2 | Development of PMHAS

2.2.1 | Components of PMHAS

First of all, we developed an open questionnaire, interviewed psychological experts ($n = 4$), senior police officers ($n = 15$), and several general police officers ($n = 30$) and, meanwhile, consulted experts ($n = 39$) in related fields at

the Annual Conference of Chinese Social Psychology to obtain the basic components of PMHA. Then, we developed a half-open and half-closed questionnaire and conducted a survey of psychological experts ($n = 4$) and police officers at Chongqing Combat Training Base ($n = 90$). On the basis of the survey and the analysis of previous literature, we preliminarily established the five dimensions of PMHA: cognitive flexibility (e.g., when dealing with problems, I am used to proposing multiple solutions before choosing the best), emotional catharsis (e.g., faced with complex issues, I cannot quickly sort things out and make a decision), swift decisiveness (e.g., when in sorrow, I will tell others how I feel), behavioral drive (e.g., I will pursue what I want with an “against all odds” attitude), and reward pursuit (e.g., When I get what I want, I feel excited and full of energy).

2.2.2 | Items of preliminary PMHAS

We referred to MHAQA,²⁸ a questionnaire developed by our research group before and widely used in the military, for items of preliminary PMHAS and modified the verbal description and scenarios of some items. Then, we developed some new items based on the open questionnaire and individual interview and made sure that the descriptions were close to police officers' job scenarios and easy to understand. After completion, several psychological experts ($n = 4$) and police officers ($n = 10$) were invited to review the items, and those unclear, difficult to understand, or doubtful ones were either modified or deleted. Finally, the preliminary PMHAS composed of 54 items was obtained.

2.2.3 | Data analysis

IBM SPSS Statistics 25.0 was first used for the exploratory factor analysis of PMHA. AMOS version 20.0 was then used to conduct confirmatory factor analysis (CFA) to reduce the number of items on the scale and confirm the construct of PMHAS. IBM SPSS Statistics 25.0 was finally used to further verify the scale's internal consistency and construct validity.

3 | RESULTS

3.1 | Exploratory factor analysis

3.1.1 | Item selection

We conducted an independent sample t test among the high-score group (top 27%) and the low-score group (bottom 27%) and removed items with no significant

difference ($p > .05$). The correlation between the items and the total score was analyzed, and items with a correlation coefficient lower than 0.40 were deleted. At last, 43 items were retained for PMHAS.

3.1.2 | Exploratory factor analysis

First, we determined whether the factors of PMHAS were suitable for exploratory factor analysis. The KMO statistical value was 0.858, and the results of Bartlett's spherical test were significant ($\chi^2 = 6170.002$, $df = 903$, $P < .001$), indicating that the data were suitable for factor analysis. The exploratory factor analysis was then conducted for the 43 items in the initial scale. After the first factor analysis, some unsuitable items were removed for the following reasons: (1) multiple dimensions were loaded at the same time, (2) factor load was less than 0.40, (3) and factors/dimensions contain less than 3 items. This time, a scale of 27 items was obtained.

After the second exploratory factor analysis, a total of five common factors were extracted, which were consistent with the originally prepared concept, accounting for 55.055% of the cumulative variances, with a communality of >0.4 . Based on the results of factor analysis and the meaning of the items for each factor, a scale of 27 items was obtained, with five factors named cognitive flexibility, swift decisiveness, emotional catharsis, a behavioral drive, and reward pursuit.

Through further analysis, we found a large discrepancy between the number of items contained in each factor (13 items for cognitive flexibility, 4 items for swift decisiveness, 4 items for emotional catharsis, 3 items for behavioral drive, and 3 items for reward pursuit). Therefore, while ensuring the scale's consistency with the previous concept, we removed items with low communality for cognitive flexibility. After principal component analysis and Promax optimal oblique axis analysis (correlation coefficient between factors >3),³¹ five common factors were extracted with a total of 20 items. The communality of each item was >0.4 , accounting for 58.904% of the cumulative variances. We present the constructed matrix of PMHAS in Table 1.

3.2 | Confirmatory factor analysis

Amos 20.0 was used for confirmatory factor analysis. The following indices were tested to assess the model's fit: χ^2/df , with the values of ≤ 10 , < 5 , and < 2 indicating that the model was acceptable, fit well, and fit very well, respectively; RMSEA, with values of < 0.1 and < 0.05 indicating that the model fit well and fit very well, respectively; GFI, relative CFI, IFI, and TLI, with a value of > 0.9 indicating that the model fit well.^{32,33}

TABLE 1 The construct matrix of PMHAS.

Item	F1	F2	F3	F4	F5	Communality
13	0.817					0.672
15	0.767					0.630
12	0.752					0.585
19	0.722					0.530
4	0.706					0.547
8	0.681					0.483
16		0.832				0.697
20		0.793				0.636
11		0.776				0.612
2		0.663				0.466
18			0.814			0.669
7			0.756			0.619
5			0.754			0.586
10			0.601			0.509
6				0.842		0.732
3				0.820		0.682
14				0.752		0.590
9					-0.695	0.550
1					-0.691	0.517
17					-0.677	0.470

TABLE 2 Goodness-of-fit information for confirmatory factor analysis of 27-item scale and 20-item scale.

	<i>N</i>	<i>df</i>	χ^2/df	RMSEA	GFI	CFI	IFI	TLI
PMHAS-27	292	290	1.133	0.021	0.926	0.986	0.986	0.983
PMHAS-20	292	145	1.117	0.020	0.948	0.990	0.990	0.987

Abbreviations: CFI, comparative fit index; GFI, goodness of fit index; IFI, incremental fit index; RMSEA, root mean square error of approximation; TLI, Tucker Lewis index.

The fitting parameters of the 27-item scale and 20-item scale were analyzed, respectively. The results of both scales were acceptable, indicating that both models fit well. However, compared with indices of the 27-item scale, χ^2/df of the 20-item scale was lower, and the values of the GFI, CFI, IFI, and TLI were higher, indicating that the 20-item scale was better than the 27-item scale. Goodness-of-fit information for confirmatory factor analysis of the 27-Item Scale and 20-Item Scale was displayed in [Table 2](#). Therefore, the reliability and validity of the 20-item scale were further analyzed.

3.3 | Construct validity

Factors of the scale (except $r_{\text{swift decisiveness-emotional catharsis}} = -0.006$, $r_{\text{swift decisiveness-behavioral drive}} = -0.023$) were basically moderately correlated, and their correlation coefficients were between 0.160 and 0.580, all $P_s < 0.01$. The correlation coefficients between the factors and the total

score were 0.477 and 0.819, all $P_s < 0.01$, which are provided in [Table 3](#).

3.4 | Criterion validity

Taking professional psychological quality as the criterion, the correlation between the total score of PMHAS/the score of each factor and the total score of PPQS was examined to test the validity of PMHAS. Pearson product-moment correlation results showed that the total score of PMHAS and the score of each factor were significantly positively correlated with the total score of PPQS, which are presented in [Table 4](#).

3.5 | Reliability analysis

The Cronbach's α coefficients of each factor in the scale were 0.606–0.859, and that of the scale was 0.863.

TABLE 3 The correlation between the score of each factor and between the score of each factor and the total score of PMHAS.

Factors	PMHAS	Cognitive flexibility	Swift decisiveness	Emotional catharsis	Behavioral drive
Cognitive flexibility	0.819*				
Swift decisiveness	0.633*	0.580*			
Emotional catharsis	0.526*	0.187*	−0.006		
Behavioral drive	0.477*	0.160*	−0.023	0.209*	
Reward pursuit	0.584*	0.391*	0.223*	0.317*	0.197*

* $P < .01$.

TABLE 4 The correlation between the total score of PMHAS/the score of each Factor and the total score of PPQS.

	PMHAS	Cognitive flexibility	Emotional catharsis	Swift decisiveness	Behavioral drive	Reward pursuit
PPQS	0.737**	0.789**	0.241**	0.720**	0.244*	0.481**

* $P < .05$; ** $P < .01$.

Factors	Cronbach's α coefficients	Split-half reliability	Test–retest coefficients
Cognitive flexibility	0.859	0.892	0.696*
Swift decisiveness	0.780	0.757	0.602*
Emotional catharsis	0.732	0.770	0.629*
Behavioral drive	0.775	0.704	0.692*
Reward pursuit	0.606	0.690	0.637*
PMHAS	0.863	0.852	0.732*

* $P < .01$.

TABLE 5 The internal consistency reliability and test–retest reliability of PMHAS.

The split-half reliability of each factor was 0.690–0.892, and that of the scale was 0.852. The test–retest coefficients of each factor were 0.602–0.696 and that of the scale was 0.732, with all $P_s < 0.01$. We display the results in Table 5.

4 | DISCUSSION

During personnel selection, different psychological indicators or scales have been used to evaluate the mental health ability of police officers. However, the selection results are less convincing and scientific due to the lack of targeted assessment tools or unified standards to directly measure their mental health ability. Therefore, it is necessary to develop a valid and reliable tool to evaluate PMHA. Through literature analysis, interviews, and expert discussions and combining qualitative research and quantitative research, we theoretically determined the components of PMHA and developed PMHAS.

Through exploratory factor analysis, five stable factors were extracted, including cognitive flexibility, swift decisiveness, emotional catharsis, behavioral drive, and

reward pursuit. Then, through confirmatory factor analysis, 20 items were finally retained for the scale, as the five factors account for 58.904% of the variance of the 20-item scale, and 55.055% of the variance of the 27-item scale, with the former's fitting parameter values better than those of the latter. The results of construct validity analysis showed that the correlations between factors of the 20-item scale were moderate or below (0.006~0.580), which were lower than those between the score of each factor and the total score (0.477~0.819), indicating a certain degree of independence between the factors and the factors are well representative of the scale. Due to the close connection between professional psychological quality and mental health ability, professional psychological quality was used as the criterion to examine the validity of PMHAS. The results showed that the total score of PMHAS and the score of each factor were significantly and positively correlated with the total score of PPQS, indicating that PMHAS has good criterion validity and could predict professional psychological quality well. Through reliability analysis, we found that Cronbach's α coefficient, split-half reliability, and test–retest reliability

of each factor of the scale were all >0.6 , indicating that the scale is consistent and reliable.

PMHAS measures the comprehensive ability of police officers, reflected in five factors, including cognitive flexibility, swift decisiveness, emotional catharsis, behavioral drive, and reward pursuit. Generally, police officers will go through three occupational stages: adaptation, balance, and development. The adaptation stage is the first-stage police officers will undergo after joining the police force, which is highly concentrated and uniformed, requiring justice in law enforcement, serving the people wholeheartedly, and compliance with the rule of law. Individual police officers should possess the ability to control their behavior and pursue rewards, so as to maintain self-discipline and gradually adapt to their profession. This mainly involves the motivation component of PMHA. The balance stage emphasizes that police officers calmly respond to the pressure or stimulus of external events, mobilize subjective initiative, tap their own strengths, evaluate their “resilience assets,”^{34,35} identify their own emotions, release negative emotions, and reasonably express emotions for active self-regulation. As a component of mental health ability, the good emotional ability can help individuals to regulate their emotions and adapt to greater work stress, which enables police officers to stabilize their emotions in overloaded law enforcement work, patiently handle cases and parties involved, improve emotional control ability and reduce negative responses to stressful events, so as to prevent emotional, verbal and even behavioral violence in on-site law enforcement.^{36–38} This mainly involves the cognitive and emotional components of PMHA. The development stage is the stage of growth and efficiency improvement. To handle various role conflicts and stressful events and achieve career development, police officers need to be cognitively flexible, make decisions decisively, and execute decisions in a principled manner. This mainly involves the cognitive and willpower components of PMHA. Therefore, the five-factor model of PMHAS fits well with the professional psychological adaptation and development process of police officers and conforms to the theoretical concept of the generation and development of PMHA.

Future research may focus on the following aspects: first of all, we will expand the sample size, that is, to conduct large-scale evaluations across the public security system nationwide, and establish a standard norm and system for the evaluation of PMHA. Second, we will divide police into subgroups according to the police classification, gender, and other factors to examine whether their mental health ability is consistent with that in the five-factor model and the difference between factors. Furthermore, we will combine the current self-declared

subjective assessment of scale with neurobiological indicators, such as using portable EEG, near-infrared imaging, magnetic resonance imaging, etc., to establish a mental health ability evaluation system from multiple angles, so as to objectively, comprehensively, and accurately assess PMHA and provide scientific reference for ability training and selection of police.

5 | CONCLUSION

Overall, by identifying the concept and components of PMHA, this study presents a promising, psychometrically sound measure of PMHA which conforms to the professional characteristics of police and provides a scientific system for the evaluation of PMHA and police selection. Besides, this study also provides quantifiable goals and evaluation indices that can be used for more targeted cultivation and shaping of PMHA and for the generation of combat effectiveness.

AUTHOR CONTRIBUTIONS

Conceptualization: CL, JH, and ZF; Methodology: CL, XG, YJ, and ZF; Validation: CL and XG; Formal analysis: CL and YJ; Investigation: CL, FX, and YJ; Resources: ZF; Data curation: XG; Writing—original draft preparation: CL; Writing—review and editing: CL, XG, and ZF; Supervision: ZF; Funding acquisition: ZF and JH.

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DATA AVAILABILITY STATEMENT

The data sets acquired and/or analyzed during the current study are available from the corresponding author upon reasonable request.

DISCLOSURE

Approval of the research protocol: The study was approved by the Medical Ethics Committee of Army Medical University. *Informed Consent:* Informed consent was obtained from all subjects involved in the study. *Registry and the Registration:* No. of the study/trial: N/A, *Animal Studies:* N/A, *Conflict of Interest:* The authors declare that they have no conflict of interest.

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