

A study on the optimization of mental health care service systems for employees in aerospace enterprises in the new era

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Abstract. Given the highly precise, high-risk, and high-intensity nature of aerospace work, aerospace employees are frequently exposed to prolonged psychological stress characterized by heavy pressure, sustained concentration, and significant responsibility, resulting in prominent issues such as occupational burnout and anxiety. Drawing upon literature review and systematic analysis methods, this study examines the practical realities of aerospace research and production, identifies the characteristics of employees' psychological health service needs, and diagnoses the shortcomings of existing psychological support initiatives implemented by trade unions. On this basis, Psychological Capital Theory and Social Support Theory are introduced to construct an aerospace-oriented psychological health care service system encompassing six dimensions: institutional integration, scenario-based services, team development, field-operation coverage, humanistic workplace ecology, and assessment optimization. The study further proposes practical approaches, including graded interventions throughout the entire lifecycle of aerospace projects, position-specific psychological services, and the establishment of a dual-support framework combining "internal key personnel and external expert think tanks." The findings provide both a theoretical reference and a practical framework for aerospace enterprise trade unions seeking to deliver professional psychological health services for employees.

Keywords: New Era, aerospace enterprises, psychological health, service system, optimization

1. Introduction

As a core pillar of the nation's strategic scientific and technological capabilities, aerospace enterprises undertake major national projects such as human spaceflight, deep-space exploration, and the BeiDou Navigation Satellite System. At present, aerospace project development is characterized by parallel program implementation, high-frequency launch activities, and increasingly complex system integration. The intensity of technological breakthroughs, the frequency of testing and verification activities, and the duration of field

operations continue to rise, creating a work environment marked by high intensity, heavy workloads, and substantial personnel mobility. Aerospace positions are distinguished by profound mission responsibility, stringent quality requirements, rapid technological iteration, and rigid project milestones. Consequently, employees remain under sustained psychological stress arising from the combined effects of professional accountability, technological challenges, and project schedule pressures.

As the bridge linking the Party with the workforce, trade unions are responsible for providing professional, targeted, and scenario-oriented psychological health services. Such efforts are not only a political requirement for implementing the employee psychological health service initiatives advocated by the All-China Federation of Trade Unions, but also a practical necessity for supporting the central tasks of aerospace research and production. At present, most aerospace enterprise trade unions have gradually introduced basic initiatives such as psychological health lectures, recreational stress-relief activities, and employee care programs. However, several challenges remain. Generalized services are more common than those tailored to aerospace-specific scenarios; broad-based awareness campaigns outweigh targeted interventions for specific job roles; and short-term activities are more prevalent than sustainable long-term mechanisms. As a result, a comprehensive psychological care system suited to the high-intensity research and production model of the aerospace industry has yet to be established. Considering the unique characteristics of the aerospace sector and the specific needs of its workforce, this study systematically constructs a psychological health care service system for employees in aerospace enterprises, with the aim of providing theoretical support and practical guidance for improving the quality and effectiveness of psychological services delivered by trade unions across the aerospace sector.

2. Theoretical foundations and analytical framework

2.1. Psychological Capital theory

Psychological Capital (PsyCap) refers to an individual's positive psychological state manifested during growth and development, encompassing four core dimensions: self-efficacy, hope, optimism, and resilience. Research by Luthans et al. [1] demonstrates that psychological capital, as a developable psychological resource, can effectively mitigate the negative effects of work-related stress on occupational burnout. Aerospace employees operate in work environments characterized by high uncertainty and substantial costs associated with failure, which place considerable demands on their psychological resources. Consequently, systematic organizational interventions are needed to replenish and strengthen psychological capital.

2.2. Social support theory

The Social Support Theory proposed by House et al. [2] emphasizes that multidimensional support networks derived from organizations, colleagues, and families can significantly reduce the psychological harm caused by work-related stress. The effectiveness of psychological health services provided by trade unions in aerospace enterprises largely depends on whether such support networks extend across all work scenarios encountered by employees, particularly under special circumstances such as field testing and critical project missions.

2.3. Analytical framework of this study

Drawing upon Psychological Capital Theory and Social Support Theory, this study establishes a four-stage analytical framework consisting of needs identification, deficiency diagnosis, system construction, and

pathway implementation. This framework is designed to systematically address the distinctive characteristics and practical requirements of psychological health services for aerospace employees.

3. Value and significance of psychological health care initiatives conducted by trade unions in aerospace enterprises

3.1. Enhancing employees' psychological capital and well-being

Through psychological health education, training programs, professional counseling, and related support measures, employees can acquire greater knowledge of psychological health and develop positive attitudes toward mental well-being. According to Psychological Capital Theory [1], systematic organizational interventions contribute to strengthening employees' self-efficacy, hope, optimism, and resilience, thereby improving their capacity to cope with stress. When employees master scientifically grounded stress-management strategies and achieve a healthier balance between work and personal life, both their psychological well-being and overall life satisfaction can be significantly enhanced.

3.2. Improving work efficiency and organizational performance

Employees with sound psychological health are more likely to maintain positive emotions under appropriate levels of pressure and are better prepared to confront complex problems and challenging tasks. Psychological care mechanisms can stimulate employees' motivation, initiative, and creativity, enabling them to demonstrate higher levels of engagement and stronger performance in areas such as technological innovation, process improvement, and management reform. From an organizational perspective, improvements in employees' psychological capital can be directly translated into enhanced corporate performance and competitiveness, thereby providing critical human-resource support for the successful completion of aerospace research and production missions.

3.3. Strengthening team cohesion and organizational stability

A work environment characterized by humanistic care, positive interpersonal relationships, and effective communication mechanisms helps foster mutual understanding, trust, and collaboration among employees, thereby enhancing organizational cohesion. Psychological care initiatives can strengthen employees' sense of belonging and reduce the turnover of key personnel. Moreover, a corporate image that demonstrates genuine concern for employees' psychological well-being can improve public reputation and increase the organization's attractiveness to highly qualified talent, thus establishing a solid human-resource foundation for sustainable development.

4. Existing shortcomings in employee psychological health care initiatives conducted by trade unions in aerospace enterprises

In recent years, trade unions across aerospace organizations have continuously strengthened employee care programs. However, when assessed against the unique demands of the aerospace industry, the realities of high-intensity research and production environments, and employees' increasingly specialized psychological needs, several shortcomings remain.

4.1. Insufficient top-level design and lack of an aerospace-specific service framework

Most trade union psychological health initiatives continue to follow generalized service models [3], without establishing institutional arrangements and operational procedures tailored to aerospace-specific scenarios such as critical project development, field testing, and technical fault investigation and resolution. Psychological services have not been deeply integrated into the full lifecycle management of aerospace programs. Instead, they are often implemented as stand-alone activities separate from research and production processes. As a result, they lack the systematic, forward-looking, and scenario-based design necessary to accommodate the high-pressure, high-intensity, and high-responsibility nature of aerospace work.

4.2. Homogeneous service approaches and insufficient role-specific support

Current services primarily consist of general psychological health lectures, online educational programs, and recreational activities. Their content largely focuses on common workplace stress management, while differentiated support for specific occupational groups—such as research and design personnel, assembly and testing staff, field operation teams, and technical managers—remains seriously inadequate. Existing programs provide insufficient responses to issues unique to the aerospace sector, including psychological counseling during intensive project development phases, emotional adjustment following fault investigation and review processes, stress relief for field personnel, and career uncertainty among young researchers. Consequently, both the precision and effectiveness of these services remain limited.

4.3. Weak professional capacity and limited ability to address complex situations

Psychological challenges faced by aerospace employees combine universal workplace concerns with industry-specific characteristics, thereby requiring highly specialized support services. However, many grassroots trade union officials serve on a part-time basis and lack systematic training in areas such as psychological counseling for aerospace professionals, intervention for high-pressure emotional states, crisis identification, and psychological support for field operations [4]. As a result, they are generally capable of providing only basic psychological education and awareness programs. Furthermore, many organizations have yet to establish professional psychological expert networks tailored to high-pressure aerospace workforces. Consequently, they often lack the expertise necessary to address complex issues such as severe occupational anxiety, stress associated with fault investigation and accountability processes, and long-term occupational burnout.

4.4. Inadequate privacy protection and cultural support, resulting in low employee participation

Aerospace employees place exceptionally high value on the confidentiality of their psychological conditions. In some organizations, procedures related to psychological assessments, counseling sessions, and record management remain insufficiently standardized. Employees may therefore worry about being labeled, stigmatized, or publicly identified, potentially affecting career advancement and job assignments. Such concerns reduce their willingness to participate proactively in psychological health programs. At the same time, some organizations have yet to cultivate a workplace culture that encourages open recognition of stress and promotes scientific approaches to stress management. The tendency to prioritize mission accomplishment while overlooking psychological well-being continues to persist.

4.5. Limited integration between psychological care and core organizational tasks

In some cases, trade unions continue to equate psychological care primarily with recreational activities and holiday greeting programs [5], rather than integrating psychological support throughout the entire process of

project development, team management, ideological and political work, and workplace safety management. As a result, psychological services remain disconnected from the core activities of research and production. Their potential role in enhancing employees' psychological resilience, supporting major aerospace missions, and maintaining workforce stability has not been fully realized.

5. Construction of a psychological health care service system for employees in aerospace enterprise trade unions

Based on the distinctive characteristics of the aerospace industry—including high pressure, substantial responsibility, rigorous standards, and unique operational scenarios—and guided by the principles of prevention first, targeted intervention, integration with core organizational tasks, and long-term empowerment, a psychological health care system with aerospace-specific characteristics should be established.

5.1. Improving the aerospace-specific institutional framework through systematic integration

5.1.1. Establishing dedicated operational mechanisms

Taking into account the operational characteristics of aerospace project development, field testing, and mission-critical tasks, organizations should formulate specialized policies such as the *Special Program for Psychological Health Care of Aerospace Employees*, the *Measures for Psychological Counseling Management During Aerospace Project Missions*, and the *Guidelines for Psychological Care Services for Field-Test Personnel* [5]. Psychological health services should be embedded into the entire lifecycle of aerospace projects, including project development phases, field deployment periods, and quarterly and annual research cycles, ensuring that psychological support is planned, implemented, and evaluated alongside research and production activities.

5.1.2. Establishing dynamic psychological profiles

Based on the characteristics of different positions—including research and development personnel, assembly and testing staff, and managerial employees—regular stratified psychological health assessments should be conducted. A dynamic psychological profile should be established for each employee and updated continuously. Particular attention should be paid to psychological conditions during high-pressure periods such as critical project development stages, technical fault investigation and resolution phases, and field deployment assignments. This approach facilitates dynamic monitoring, graded early warning, and targeted intervention.

5.1.3. Establishing a graded intervention mechanism throughout the aerospace project lifecycle

Differentiated intervention strategies should be developed for four critical phases: routine operational periods, intensive project development and sprint phases, technical fault investigation and review stages, and long-term field deployment periods. During routine periods, emphasis should be placed on psychological education, preventive care, and positive mindset cultivation. During intensive project development phases, priority should be given to stress reduction, psychological empowerment, and emotional counseling. During technical fault investigation and review stages, interventions should focus on emotional support and pressure relief. During field deployment periods, services should emphasize emotional companionship, organizational care, and remote psychological support.

5.1.4. Strictly implementing privacy and confidentiality measures

Comprehensive confidentiality regulations should be established for psychological profiles, counseling records, and assessment data. Information should be managed by designated personnel, stored using secure

encryption systems, and accessed solely for professional service purposes. Unauthorized disclosure of information and stigmatizing evaluations of employees must be strictly prohibited, thereby eliminating employees' concerns regarding privacy and encouraging active participation in psychological health programs.

5.2. Developing scenario-based service platforms to meet position-specific needs

Traditional generalized service approaches should be replaced by precise and customized psychological services designed around the distinctive work scenarios encountered in the aerospace sector.

5.2.1. Regularly providing aerospace-oriented psychological education

Targeting the most common psychological challenges faced by aerospace employees, organizations should offer specialized educational programs on topics such as psychological adjustment under high-pressure conditions, stress management during critical project phases, emotional regulation following technical fault investigations, coping with loneliness during field assignments, recovery from research-related burnout, and psychological resilience among highly educated professionals. Through trade union public communication platforms, team-based learning sessions, and brief presentations during research meetings, employees can be equipped with practical psychological adjustment strategies tailored to aerospace work environments, thereby strengthening their self-regulation capabilities.

5.2.2. Delivering customized services for key employee groups

Psychological support should be provided through a stratified and targeted approach. For young research personnel, counseling should focus on workplace adaptation, professional development, research career growth, and career planning, helping alleviate uncertainty and innovation-related pressure. For mid-career technical specialists, programs should emphasize stress management, physical and mental well-being, and work–family balance. For employees in high-risk assembly and testing positions, interventions should focus on attention training and techniques for relieving tension and anxiety. For field-test personnel, services should include remote psychological support, care and greeting programs for employees working away from home, and group-based stress-relief workshops [4].

5.2.3. Establishing dedicated psychological support mechanisms for critical aerospace missions

During major project development campaigns, year-end mission sprints, and critical testing milestones, trade unions should provide direct support at frontline teams and testing sites through dedicated "Psychological Support for Mission Success" initiatives. Measures may include brief group counseling sessions, one-on-one conversations, stress-relief activities, and employee care programs. These interventions can effectively alleviate acute psychological pressure and help maintain emotional stability among mission teams.

5.2.4. Expanding both online and offline counseling channels

Dedicated psychological consultation days for aerospace employees should be organized by trade unions, with professional counselors invited to provide on-site services within research institutes and affiliated organizations. At the same time, remote psychological hotlines and anonymous online counseling platforms should be established for personnel working in field locations, addressing barriers related to accessibility and facilitating timely emotional support and communication.

5.3. Strengthening the dual-team model of "internal core personnel + external experts" to enhance professional service capacity

5.3.1. Cultivating an internal team of psychological service personnel

A dedicated volunteer team for employee psychological services should be established by selecting highly responsible individuals who are familiar with research and production environments from among trade union

officials, team leaders, young professionals, and Party branch publicity officers [3]. Training should focus on practical competencies, including the identification of psychological issues among employees working under high-pressure conditions, basic emotional counseling techniques, preliminary crisis assessment, and supportive communication with frontline staff. The objective is to build a localized service team that understands scientific research, job requirements, employee needs, and psychological support practices.

5.3.2. Establishing an external expert advisory network

Long-term partnerships should be developed with professional psychological service institutions, mental health centers, and university psychology departments. Through these collaborations, an expert advisory network specializing in high-technology, high-pressure workforces, research-oriented workplaces, and technical teams can be established. Such experts can provide professional intervention, in-depth counseling, and referral services for aerospace employees experiencing complex psychological difficulties, psychological crises, or long-term occupational burnout.

5.3.3. Establishing a regular training and practice mechanism

Psychological service personnel should participate regularly in case discussions focusing on aerospace workplace psychology, scenario-based simulation exercises, and reviews of psychological support activities conducted during critical project missions. These activities will continuously enhance the team's practical capabilities and improve its ability to provide effective services within aerospace research and production environments.

5.4. Addressing gaps in field-operation support and achieving comprehensive service coverage

To eliminate service blind spots affecting personnel engaged in field operations, a comprehensive support system integrating routine care and remote psychological empowerment should be established [5]. Psychological care records should be maintained for field-test personnel through a management approach characterized by "one profile for each employee, continuous support during deployment, and regular follow-up after assignment." In addition, organizations should regularly conduct video-based care sessions, remote psychological support workshops, holiday consolation activities for deployed personnel, and family-linked support programs. These measures can help alleviate loneliness, homesickness, and work-related stress among employees stationed away from home, ensuring that field personnel feel both organizational support and emotional warmth while carrying out frontline missions.

5.5. Promoting the integration of humanistic care and ideological guidance to foster a supportive aerospace workplace culture

5.5.1. Conducting regular heart-to-heart communication with frontline research personnel

Trade union officials and team leaders should routinely visit research laboratories, assembly workshops, and testing sites to engage directly with employees, listen to their concerns, and gain timely insight into pressures associated with aerospace projects, work-related challenges, and personal difficulties. Through these efforts, emotional issues can be identified and addressed at an early stage, while practical problems can be resolved before they escalate.

5.5.2. Utilizing the aerospace spirit to positively empower employees

Drawing on model-worker presentations, aerospace spirit education programs, and publicity surrounding major project achievements, organizations should actively promote the values embodied in the aerospace spirit. These initiatives can guide employees toward developing sound perspectives on professional

responsibilities, workplace pressure, and personal success and failure, while fostering professional attitudes characterized by rigor, pragmatism, optimism, initiative, and a strong sense of responsibility.

5.5.3. Strengthening support for both work and family life

Organizations should address practical concerns related to overtime meal services, rest and compensatory leave arrangements, commuting support, children's education, and family care. By improving logistical support and employee welfare services, employers can reduce employees' personal concerns and alleviate sources of psychological stress at their origin.

5.6. Improving evaluation and optimization mechanisms to promote deep integration with core research activities

Employee psychological health care initiatives should be incorporated into annual trade union performance evaluations, team development assessments, and workforce development evaluation systems. The effectiveness of psychological services should be linked to key organizational outcomes, including support for aerospace project missions, workforce stability, and workplace safety.

In addition, regular surveys of employees' psychological needs should be conducted. Service content should be continuously adjusted and optimized in response to emerging tasks, new operational scenarios, and evolving sources of workplace stress. Through this dynamic improvement process, organizations can avoid formalistic and homogeneous service approaches while continuously enhancing the contribution of psychological services to aerospace research and production activities.

6. Conclusion

In the new era, psychological health care initiatives undertaken by trade unions in aerospace enterprises serve not only as projects of employee care but also as initiatives that foster organizational cohesion and provide essential support for mission accomplishment. Faced with the aerospace industry's enduring realities of high-intensity workloads, substantial responsibility, and rigorous professional standards, trade unions must remain firmly grounded in the distinctive characteristics of the aerospace sector, closely aligned with research and production environments, and focused on addressing employees' most pressing psychological needs. Generalized and formalistic service models should be replaced by a comprehensive psychological health care system that is institutionalized, professionalized, scenario-based, and universally accessible. Through targeted psychological counseling, meaningful humanistic empowerment, and comprehensive employee care, organizations can effectively alleviate occupational stress, reduce negative emotions, and restore positive professional mindsets among aerospace employees. In doing so, they can continuously strengthen the collective determination, resilience, and innovative spirit of the aerospace workforce. Such efforts will provide a solid human-resource foundation for the successful completion of major aerospace missions and contribute to the accelerated realization of the goal of building China into a leading aerospace power.

References

- [1] Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge*. Oxford University Press.
- [2] House, J. S. (1981). *Work stress and social support*. Addison-Wesley.
- [3] Zhang, Y. (2025). Exploring pathways for constructing employee mental health service systems in defense industry enterprises [in Chinese]. *Enterprise Political Work and Humanistic Development*, 8, 62–64.

- [4] Wang, L. (2025). Occupational stress and psychological counseling strategies for employees in high-pressure research institutions [in Chinese]. *Chinese Workers' Education*, 4, 78–80.
- [5] Li, S. (2026). Innovative practices in trade union mental health care in state-owned enterprises in the new era: A case study of aerospace research institutes [in Chinese]. *Aerospace Industry Management*, 2, 45–48.