

Supervisor Support, Job Satisfaction, And Innovative Behavior: A Qualitative Study In The Pharmaceutical Industry

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Abstract

Purpose – This study explores the role of supervisor support in shaping the job satisfaction and innovative behavior of research and development (R&D) personnel in China's pharmaceutical industry.

Design/methodology/approach – A qualitative research design was employed, utilizing semi-structured interviews with R&D personnel (N=22) from eight leading pharmaceutical companies in Sichuan, China. Participants at different career stages (junior, mid-level, and senior) were selected to ensure data diversity. Thematic analysis was conducted to identify key themes related to supervisor support, job satisfaction, and innovation.

Findings – The research results indicate that supervisor support enhances the job satisfaction of R&D personnel through Providing Help & Support, Empowerment & Autonomy, Communication & Feedback, Inspiring Creativity, and Employee Development, thereby improving their innovative behavior.

Practical implications – The findings suggest that pharmaceutical companies should strengthen supervisor support mechanisms by providing leadership training, encouraging constructive feedback, and fostering a culture of innovation. Enhancing supervisor support can increase job satisfaction and ultimately improve R&D personnel's innovative performance.

Originality/value – This study contributes to the literature by offering qualitative insights into the nuanced relationship between supervisor support, job satisfaction, and innovative behavior in R&D contexts. It provides a deeper understanding of how organizational leadership can effectively foster innovation in knowledge-intensive industries.

Keywords: Supervisor support, Job satisfaction, Innovative behavior, R&D personnel, Qualitative research

1. INTRODUCTION

Employee innovative behavior involves generating creative ideas or solutions and actively pursuing their implementation to facilitate the realization of innovation (Carmeli & Spreitzer, 2009; Scott & Bruce, 1994a). These behaviors include developing useful new ideas, introducing novel processes, creating new products and procedures, and expanding into new markets (ÅMo & Kolvereid, 2005; Farrukh et al., 2021; Janssen, 2000; Scott & Bruce, 1994b). As individuals responsible for generating and implementing innovative solutions within organizations, employees play a crucial role in driving organizational innovation (Purc & Laguna, 2019). Their innovative behaviors enhance firms' innovation performance (Laily & Ernawati, 2020) and innovation efficiency (Dedahanov et al., 2017), both of which are vital for maintaining a competitive advantage and ensuring long-term organizational sustainability (Saether, 2019). The pharmaceutical manufacturing industry is a knowledge- and technology-intensive sector where competitiveness largely depends on firms' research and development (R&D) capabilities and innovation

efficiency (Veleva et al., 2018). The research and development (R&D) personnel in the pharmaceutical industry primarily engage in ongoing activities such as new drug design, new drug development, process technology development, and improvement, formulation development, and drug manufacturing (Ekeigwe, 2019; Kuppuswamy et al., 2021; Romasanta et al., 2020; Shukla et al., 2020). In the pharmaceutical manufacturing industry, the processes of drug discovery and development are essential factors influencing innovation efficiency (Paul et al., 2010). As a high-tech sector, pharmaceutical manufacturing depends on R&D personnel to drive key technological innovations, including new drug research and development, optimization and enhancement of production processes, quality control, clinical drug testing, and formulation development (Melnychuk et al., 2021; Narayanan et al., 2020; Schutte et al., 2017). Their innovative behavior significantly contributes to facilitating technological advancements (Noefer et al., 2009). However, R&D personnel in China's pharmaceutical manufacturing companies face various challenges when it comes to implementing innovative behaviors (Li et al., 2019; L. Zhang et al., 2023). How to motivate R&D personnel to implement innovative behaviors is the main issue of this study.

However, fostering innovation among employees is a complex challenge that depends on various organizational and psychological factors. Among them, supervisor support has been recognized as a key enabler of employee innovative behavior (Janssen, 2000; Zhou & George, 2001). While previous studies have explored the relationship between supervisor support and innovation, there remains a lack of in-depth understanding of how and why supervisor support influences R&D personnel's innovative behavior, particularly through psychological mechanisms such as job satisfaction. Research has indicated that supervisors significantly impact employees' job performance (Charoensukmongkol et al., 2016). Employees depend on their supervisors for information, resources, and social support to foster and implement new ideas (Janssen, 2005). The strategic planning and organizational management within pharmaceutical companies are vital for their survival and growth (Al-Qudah, 2018). Effective organizational planning and scientific management can enhance employees' innovative potential (Nani & Safitri, 2021). Supervisors play a crucial role in communicating organizational strategies and management practices that motivate employees' innovative behaviors (Bonn & Christodoulou, 1996; Koziol-Nadolna, 2020) (Koziol-Nadolna, 2020). This is because supervisors' encouragement and recognition can inspire employees to dedicate their time, effort, and expertise to innovation-related activities (Yang et al., 2020). When employees sense support and rewards from supervisors, they may feel more dedicated to the organization and engage in innovative behaviors influenced by psychological contracts (Bhatnagar, 2014). Empowering supervisors endows employees with decision-making capabilities and a willingness to take risks, fostering greater creativity as they actively pursue new and effective methods to accomplish tasks, thus enhancing their innovative behaviors (Darvishmotevali, 2019). Moreover, job satisfaction has been suggested as a potential mediator in this relationship, as employees who are more satisfied with their work tend to exhibit greater commitment, creativity, and risk-taking in innovation (Alshebami, 2021; Tang et al., 2019). Despite the theoretical recognition of supervisor support as a driver of employee innovation, there are several unresolved issues that necessitate further investigation: How does supervisor support influence the innovative behavior of R&D personnel in the pharmaceutical industry through job satisfaction? Most previous research has relied on quantitative methodologies, which, while useful in identifying correlations, do not capture the rich, context-dependent insights into employees' lived experiences and workplace realities (Darvishmotevali, 2019; Mishra et al., 2019). A qualitative approach is needed to explore the mechanisms underlying this relationship from the perspective of R&D personnel themselves. To address this gap, this study employs qualitative interviews with R&D personnel in the pharmaceutical manufacturing sector to explore how supervisor support

influences their job satisfaction and, consequently, their innovative behavior. By providing an in-depth examination of this process, the study aims to offer practical implications for organizational leaders and HR managers in designing supportive environments that foster innovation while also contributing to theoretical advancements in innovation and leadership research.

2.LITERATURE REVIEW

2.1 Supervisor Support and Innovative Behavior

According to organizational support theory, when employees perceive support from their supervisors for innovative work, they are encouraged by this support and leverage the supervisor's influence to engage in innovative activities at work (Janssen, 2005). Specifically, supervisor encouragement enhances employees' self-confidence, facilitating innovative behaviors (Mishra et al., 2019). When employees encounter challenges at work, they seek assistance from their supervisors. Receiving both work-related and emotional support from supervisors helps establish a trusting relationship between the employee and the supervisor (Khalifa, 2019; Thacker & Stoner, 2012), which in turn promotes the occurrence of innovative behaviors among employees. Koziół-Nadolna (2020) argues that supervisors play a crucial role in providing feedback on organizational strategic planning and management to stimulate employees' innovative behaviors. Effective organizational planning and scientific management can ignite employees' innovative potential (Nani & Safitri, 2021). Supervisor encouragement and recognition may motivate employees to invest their time, effort, and knowledge into engaging in more innovation-related activities (Yang et al., 2020). When employees perceive support and rewards from their supervisors, based on the psychological contract, they are more likely to exert greater effort and engage in innovative behaviors for the organization (Bhatnagar, 2014). Moreover, supervisor empowerment enables employees with decision-making authority and a willingness to take risks to become more creative, actively seeking new and effective ways to complete tasks, thereby enhancing their innovative behaviors (Darvishmotevali, 2019). Furthermore, (Lenka & Gupta, 2020) highlight that members of pharmaceutical research and development teams, under the leadership of their supervisors, contribute to the organization's creativity and innovation capabilities by leveraging their talents and skills. This further emphasizes the importance of supervisor support in fostering the creativity of R&D personnel.

2.2 The Role of Job Satisfaction in the Relationship Between Supervisor Support and R&D Employees' Innovative Behavior

According to the social exchange theory, supervisor support aligns with the fundamental assumptions of social exchange theory, which posits that employees form exchange relationships through interactions with leaders and team members, subsequently influencing their work attitudes and behaviors (Chernyak-Hai & Rabenu, 2018). The support provided by supervisors can enhance employees' job satisfaction, which, in turn, influences their innovative behavior (Mpuangnan et al., 2024). Supervisor support typically involves emotional support, resource provision, and fair management (Darke et al., 2024; Montani et al., 2020). The extent to which employees perceive emotional support, resource support, and career guidance from their supervisors directly influences their work attitudes and behaviors (Kurtessis et al., 2017). Supervisor support fulfills employees' basic psychological needs, such as a sense of recognition, belonging, and accomplishment, thereby enhancing job satisfaction (Eisenberger et al., 2002). Guidance, trust, and developmental opportunities provided by supervisors can enhance employees' intrinsic motivation and improve job satisfaction (Cheng et al., 2023; Udaheureka et al., 2024). Supervisors who encourage and support innovation are more likely to enhance employee satisfaction and motivate subordinates to engage in innovative behaviors (de Jong & Den Hartog, 2007).

3. METHODOLOGY

3.1 Research design

In order to explore the specific impact mechanism of supervisor support on job satisfaction and innovation behavior of R&D personnel in pharmaceutical manufacturing enterprises. This study employs a qualitative research approach to explore the mechanisms through which supervisor support influences job satisfaction and innovative behavior among R&D personnel. Data were collected through semi-structured interviews, allowing for an in-depth understanding of participants' experiences and perceptions.

3.2 Sampling Method

This qualitative study employs a combination of purposive sampling and snowball sampling techniques. Purposive sampling is suitable for selecting specific groups based on the research objectives, offering both convenience and intentionality (Campbell et al., 2020). Snowball sampling, on the other hand, involves initially interviewing a small group of randomly selected participants and then asking them to refer others who meet the criteria of the research population (Barglowski, 2018).

3.3 Participants

Vasileiou et al. (2018) suggested that a sample size of 20-30 and 15-20 interviews for a single case are sufficient in semi-structured interviews. Given constraints in human resources and finances, the study sample consists of 22 R&D personnel from eight of the top ten pharmaceutical companies in Sichuan, China. To ensure diversity in perspectives, participants were selected from different levels within the R&D hierarchy, including junior, mid-level, and senior R&D employees. The specific sample size for each company is outlined in the table below:

Table 1 Interview Participants and Corresponding Companies

Company code	Total Population	No. of Informants	
C1	2554	Novice R&D staff	5
		Veteran R&D staff	3
C2	700	Novice R&D staff	2
		Veteran R&D staff	1
C3	574	Novice R&D staff	1
		Veteran R&D staff	1
C4	426	Novice R&D staff	1
		Veteran R&D staff	1
C5	150	Veteran R&D staff	1
C6	407	Novice R&D staff	1
		Veteran R&D staff	1
C7	637	Novice R&D staff	2
		Veteran R&D staff	1
C8	260	Veteran R&D staff	1

3.4 Data Collection

This research employed both face-to-face and online interviews to conduct semi-structured interviews with the participants. Each interview lasted between 20 and 50 minutes, with three participants opting for face-to-face interviews, while the remaining 19 participants were interviewed via online calls due to time constraints preventing in-person meetings. The interview questions were designed to explore the following key aspects:

1) Manifestations of supervisor support (e.g., provision of resources, emotional support, feedback).

2) Impact of supervisor support on job satisfaction (e.g., recognition, motivation, career development opportunities).

3) Influence of supervisor support on innovative behavior (e.g., willingness to propose new ideas, and experiment with new methods).

3.5 Data Analysis

To systematically and structurally process the interview data in order to identify, analyze, and interpret the themes, this research utilized the Nvivo 14 software developed by QSR International. The collected data were analyzed using Thematic Analysis (Clarke & Braun, 2017). A coding and categorization process was employed to identify key themes, ensuring a systematic and rigorous interpretation of the findings.

4 RESULT

4.1 Supervisor Support Performance

The interview data reveals that supervisors play a critical role in the innovation process of R&D personnel. According to the findings, supervisor support is demonstrated through various actions, such as providing timely assistance, offering additional inspiration, regularly discussing work progress, holding one-on-one meetings, granting autonomy in work, trusting subordinates, and encouraging them to try innovative approaches. Through these forms of support, employees' confidence in innovation, creative thinking, and problem-solving abilities are enhanced, which, in turn, increases their motivation for innovation and improves the efficiency of innovation efforts. These supportive measures lay the foundation for employees' innovative behavior. The specific coding results are presented in Table 2.

Table 2 Coding Results and Frequency of Supervisor Support

Core Category	Main Category	Subcategory	Frequency
Supervisor Support Performance	Providing Help & Support	Timely Assistance	17
		Trust and Support	4
	Empowerment & Autonomy	Grant Work Autonomy	6
	Communication & Feedback	Regularly Discuss Work Progress	8
		Hold One-on-One Meetings	6
	Inspiring Creativity	Provide Additional Inspiration	9
		Encourage Innovation and Support Attempts	8
	Employee Development	Focus on Employee Development and Provide Growth Opportunities	4
		Encourage Employees to Participate in Industry Forums	2

4.1.1 Providing Help & Support

Throughout the interviews, 77% of respondents highlighted the critical role played by their supervisors in the innovation process, particularly during technical challenges and innovation bottlenecks. The timely assistance provided by supervisors was regarded as one of the key factors contributing to the success of innovation initiatives. Respondents commonly noted that supervisors not only provided expert technical guidance but also facilitated the smooth execution of innovation projects by coordinating resources, supporting cross-departmental collaboration, and offering advice at crucial moments. Specific descriptions are as follows:

P4: The support from my supervisor had a significant impact on my innovative work. I remember once being stuck in

improving the cell culture process. My supervisor not only helped coordinate resources from other teams but also encouraged me to boldly try new methods. Together, we overcame the obstacle, leading to a significant improvement in cell viability.

P7: During my research, I encountered numerous technical problems and experimental challenges. At those times, my supervisor always provided patient guidance and encouragement, helping me analyze issues and find solutions. He also frequently shared his experience and insights in drug development, which greatly benefited me.

P12: When I proposed new ideas or project proposals, my supervisor not only listened attentively but also provided the necessary resources and guidance, helping me turn my ideas into reality.

4.1.2 Communication & Feedback

During the interviews, six participants explicitly stated that their supervisors provided critical support throughout the innovation process by regularly conducting one-on-one meetings. Eight respondents generally believed that supervisors significantly contributed to the smooth progress of team research and development activities through regular communication and progress support. Specific feedback from respondents is as follows:

P8: My supervisor regularly organizes team seminars and communication activities, providing us with a platform to share experiences and motivate one another, thereby strengthening our team collaboration.

P10: Through regular performance reviews, my supervisor keeps track of my work progress and challenges, offering suggestions for improvement in areas where I am lacking.

P15: My supervisor regularly holds one-on-one meetings to understand my progress on innovation projects and the difficulties I encounter. They provide clear directional guidance, help me set achievable goals, and offer necessary resource support when needed.

4.1.3 Empowerment & Autonomy

Throughout the interviews, six participants mentioned that their supervisors granted them autonomy in their work. Additionally, eight participants expressed a desire for more autonomy from their supervisors to better support their innovation efforts. The respondents emphasized that supervisor support, particularly the granting of autonomy, plays a crucial role in fostering innovative behaviors. Specific descriptions are as follows:

P6: The support from my supervisor is crucial to my innovation work. He provided me with sufficient autonomy, allowing me to freely explore new research directions and methods.

P7: My supervisor allows me to make independent decisions during the research process, choosing the experimental methods and technical approaches I believe are most suitable.

P20: The support from my supervisor provides me with the freedom to experiment and explore, enabling me to pursue innovative ideas without constraints. For instance, when I proposed developing a new drug formulation, it required new experimental materials, equipment, and additional time, all of which could impact my regular work.

4.1.4 Inspiring Creativity

During the interviews, 41% of respondents stated that their supervisors provided them with greater inspiration. These respondents believed that supervisors not only assisted in overcoming challenges by addressing technical issues and providing resource support but also enhanced employees' creativity and innovative potential by stimulating inspiration and encouraging the exploration of new ways of thinking. Specifically, respondents generally considered the support from supervisors to be crucial in broadening perspectives and fostering innovation. Particularly, when it came to helping employees engage with industry trends and cutting-edge innovative concepts, the guidance from supervisors effectively sparked employees' creative ideas, significantly contributing to their innovative behaviors. Specific descriptions from the respondents are as follows:

P2: The support from my supervisor has had a profound impact on my innovative work. Not only did he help me resolve problems, but he also encouraged me to participate in expert forums within the industry. These experiences exposed me to a variety of innovative ideas and perspectives, providing me with more inspiration for my work.

P5: My supervisor allows me to make decisions in the research and development process. He frequently communicates with me to understand the progress of the team's work and provides the necessary resources and guidance. This support has been essential for me to complete my tasks successfully.

P6: My supervisor is always patient in listening to me describe the issues I face, and together we analyze the root causes of the problems, proposing new solutions. His experience and unique insights have helped me open up new avenues of thinking, enabling me to find innovative approaches to solving problems.

4.1.5 Employee Development

The interview results revealed that the role of supervisors in supporting innovation extends beyond resource and task allocation to include a focus on employees' personal growth and career development. Several respondents mentioned that the training opportunities, professional development advice, and growth support tailored to individual needs provided by their supervisors significantly contributed to the enhancement of their professional skills and personal capabilities. Specific descriptions are as follows:

P7: In addition, my supervisor also pays attention to my personal growth and development needs, offering training and learning opportunities to help me continuously improve my professional competence and skill set.

P10: Based on my personal characteristics and career plans, my supervisor provides suitable training and learning opportunities, assisting me in enhancing my abilities.

P17: My supervisor not only provides guidance in my work but also cares about my career planning. They recommend professional training to help me improve my skills and professional expertise.

4.2 The Effect of job satisfaction

The researcher coded the interview data regarding the mechanisms of job satisfaction, as shown in Table 3. The interview data reveals that various factors influence job satisfaction, including the work environment and team collaboration atmosphere, opportunities for career development, compensation and benefits, progress of research and development projects, corporate culture, freedom for innovation, nature of work content, and the commercialization of research outcomes.

Table 3 Sources and Effects of Job Satisfaction

Core Category	Main Category	Subcategory	Frequency
The Effect of Job Satisfaction	Influencing Factors	Work Environment and Atmosphere	13
		Career Development Opportunities and Growth Potential	7
		Freedom for Innovation	4
		Availability of Resources	4

4.2.1 Work Environment and Team Collaboration Atmosphere

Approximately 60% of the respondents emphasized that the work environment and team atmosphere are core factors influencing both job satisfaction and innovative behavior. The respondents noted that the company's favorable innovation environment and culture that promotes cross-departmental collaboration allow them the freedom to explore and contribute to innovation projects, thereby increasing their job satisfaction. Additionally, respondents pointed out that effective communication and collaboration within the team enhanced their work efficiency and creativity, ultimately leading to the realization of innovative outcomes. Specific descriptions are as follows:

P5: The company provides a supportive innovation environment and resources that enable me to fully utilize my creativity and imagination. I am involved in many meaningful innovation projects, which makes me feel fulfilled and satisfied.

P7: Communication and collaboration with coworkers have also had a significant impact on my job satisfaction. Our team maintains good communication and collaborative relationships, working together to solve problems and share experiences. This atmosphere makes me feel both pleasant and efficient.

P12: The work environment is open and inclusive, providing an atmosphere that supports creativity and experimentation, which is essential for innovation work.

4.2.2 Career Development Opportunities and Growth Potential

Career development opportunities and growth potential are also critical factors in enhancing job satisfaction and fostering innovation, as emphasized by 36% of the respondents. Participants indicated that personal career development opportunities and the space for learning and advancement directly influence their overall job satisfaction. Specifically, in an innovative environment, the career development opportunities, training, and learning resources provided by the company not only enhance their professional skills but also bolster their confidence and engagement in innovation activities. The following descriptions were provided:

P4: I highly value personal career development opportunities and the potential for growth, as these factors are directly tied to my overall job satisfaction. Only when there is sufficient room for development can greater enthusiasm for work be ignited.

P9: The training and development opportunities provided by the company have shown me the potential for growth and future career prospects. These opportunities have helped improve my professional competencies and have significantly increased my job satisfaction.

P18: If a job allows me to continuously learn, improve, and enhance my abilities and value, then naturally, I would feel more satisfied.

4.2.3 Innovation Freedom

According to the interview results, the freedom to innovate plays a significant role in influencing job satisfaction. Respondents emphasized that the company provides them with substantial freedom in innovation, allowing them to propose new ideas and solutions based on their expertise and experience. This freedom not only enhances their work motivation but also contributes to a sense of fulfillment and achievement in their work. Specific descriptions are as follows:

P6: Especially in terms of innovation, the company provides me with ample space for development and a platform for practical application, enabling me to freely express my creativity.

P8: The innovation freedom granted by the company is a crucial factor. Here, we can propose new ideas and solutions based on our professional knowledge and experience. This autonomy gives me a great sense of satisfaction.

P17: I believe the company has given us considerable space and opportunities to explore new ideas. Everyone is encouraged to share their thoughts, and if your ideas are valuable, you can receive the support and resources needed to implement them. This freedom and support make me feel that my work is not just about completing tasks, but about creating and realizing personal value.

4.2.3 Availability of Resources

The interview results indicate that the availability of resources is one of the key factors influencing work satisfaction and the smooth progression of innovation efforts. Respondents emphasized that resources provided by the company, such as technological research and development facilities, innovation funds, experimental equipment, and professional training, directly affect their ability to carry out work effectively and play a crucial role in fostering their work engagement and creativity.

Specific descriptions are as follows:

P5: The company has provided a supportive innovation environment and resources that allow me to fully leverage my creativity and imagination.

P12: Factors affecting my job satisfaction include the comfort of the work environment and the availability of resources.

P14: The innovation resources provided by the company, such as innovation funds, experimental equipment, and professional training, have laid a solid foundation for my innovative work. These resources enable me to focus more on innovation itself, rather than being distracted by external factors.

5. DISCUSSION

Implications for Theories

The interview data in this research further reveal that 77% of respondents believe that the timely assistance provided by supervisors at critical moments is key to overcoming technical challenges and advancing innovation. This finding further underscores the guiding and supportive role supervisors play in the innovation process. Supervisors can effectively stimulate employees' innovative motivation by granting autonomy, encouraging innovative attempts, and tolerating trial and error. Respondents generally agreed that when supervisors trust them and provide them with substantial decision-making power, employees' creativity is maximized. This finding is consistent with the research of Ul Haq et al. (2017), who argue that learning from failure can stimulate intrinsic motivation and promote innovative performance. Additionally, Darvishmotevali (2019) suggests that when employees have a certain level of decision-making freedom and the ability to take risks within an organization, they are more creative and proactively seek new ways of working. Garg and Dhar (2017) also contend that the degree of autonomy can positively predict work outcomes such as behavior and attitudes, while Hassi et al. (2022) provide direct evidence that autonomy can significantly foster employees' innovative behavior. Encouragement from supervisors may increase employees' intrinsic motivation and further enhance their creative performance. However, while supervisor support generally has a positive impact on innovative behavior, the specific effects of different forms of support on innovation behavior vary. Our study found that 77% of respondents believe that supervisors' timely assistance is one of the key factors in driving innovation, while 41% of respondents indicated that the inspiration provided by supervisors in their work plays a significant role. This suggests that emotional and informational support, rather than material support, more effectively promotes employees' innovative behavior. To some extent, employees' intrinsic motivation is crucial in the innovation process (De Spiegelaere et al., 2016). Qualitative research revealed that supervisor support enhances employees' job satisfaction, which in turn promotes their innovative behavior. 41% of respondents indicated that when their job satisfaction is high, they are more willing to challenge themselves, try new approaches, and seek breakthroughs. Furthermore, when job satisfaction is high, it stimulates their innovative drive and sustains their enthusiasm for innovation, encouraging active participation in practices that enhance their innovative capabilities. The positive correlation between this proactive innovative attitude and job satisfaction further corroborates the mediating role of job satisfaction between supervisor support and innovative behavior. The qualitative research findings further revealed the underlying mechanisms at play. According to the interview results, encouragement, recognition, and constructive feedback from leadership provided respondents with strong support, enabling them to embrace new ideas and methods, thereby enhancing their motivation for innovation. Li et al. (2019) argued that receiving affirmation from leadership, along with material and psychological rewards such as skills training opportunities, motivates research staff to implement green innovation. Bak (2020) also highlighted that feedback received by employees serves as one of the key motivating factors

that drive innovative behavior and improve performance. When employees receive constructive feedback from supervisors, they perceive the support from their leaders, which in turn fosters a proactive attitude and behavior aimed at reciprocating the supervisor's support. The research reveals that organizations enhance employees' job satisfaction by providing supportive resources, reward mechanisms, and innovation opportunities, which in turn drives the realization of innovative behavior. Additionally, it enriches the application of social exchange theory and organizational support theory in the context of innovative behavior.

Implications for Practitioners

The research demonstrates that supervisor support plays a critical role in driving employee innovation behavior. Key methods of supervisor support include providing timely assistance, regularly communicating work progress, encouraging innovation and supporting experimentation, granting employees autonomy, and focusing on employee growth while offering development opportunities. Especially when facing technical difficulties and innovation challenges, supervisors' timely help and encouragement can significantly enhance employees' innovative performance. Moreover, by establishing trust and focusing on employee development, supervisors can effectively ignite employees' passion for innovation. In practice, companies should emphasize the importance of supervisor support behaviors, train supervisors on how to provide effective emotional support and task guidance, and ultimately enhance employees' innovation capabilities, thereby fostering a more innovative organizational atmosphere.

Research Limitations and Future

The sample of the present research was limited to the top ten pharmaceutical manufacturing companies in Sichuan Province, China. The sample size and regional scope are relatively narrow. Although these companies hold a prominent position within the province and may be considered somewhat representative in terms of innovation, R&D, and management, the results may not fully apply to smaller or medium-sized enterprises in other regions or nationwide. Enterprises in different regions and of varying sizes may face distinct resource constraints, policy environments, cultural contexts, and market dynamics, all of which could influence the innovative behaviors and their driving factors of R&D personnel. Future research could collect data from a broader range of regions and industries to assess the generalizability of this research's findings, particularly regarding their applicability to small and medium-sized enterprises. Enterprises in different regions, industries, and scales face varying policy environments, market demands, and resource configurations, all of which can influence the manifestation and mechanisms of innovation behaviors. Comparative studies across different industries (such as high-tech and traditional manufacturing sectors) could explore how industry characteristics impact innovation support mechanisms.

Author contributions: Conceptualization, DY and CT; methodology, DY and CT; software, DY; validation, DY and CT; formal analysis, DY and CT; investigation, DY; resources, DY; data curation, DY; writing—original draft preparation, DY; writing—review and editing, CT; visualization, DY; supervision, CT; project administration, DY; funding acquisition, DY and CT. All authors have read and agreed to the published version of the manuscript.

Ethical Approval and Consent to Participate: This study was conducted under the ethical guidelines of the Research Ethics Committee at Mahachulalongkornrajavidyalaya University. Ethical approval was obtained from the Institutional Review Board (IRB) of the Research Ethics Committee at Mahachulalongkornrajavidyalaya University, approval number [R. 177/2024]. All participants provided informed consent prior to their participation in the study.

Conflict of interest: The authors declare no conflict of interest.

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