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Healthcare Data Sharing of Medical Administrative Teams in Chinese Hospitals

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Doctor of Management

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LIU Jun

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Abstract

In the contemporary digital age, healthcare data sharing has emerged as a critical imperative. This study develops an integrated three-level model "organization-team-leadership" to examine the factors influencing inter-team data sharing intention in healthcare institutions. Grounded in social exchange theory, social capital theory, and the theory of planned behavior, the model incorporates organizational-level factors (hospital service culture, completeness of hospital data centers), team-level factors (inter-team collaboration, team resource scarcity), and individual leadership-level factors (responsibility, positive personality, leader-leader relationships, and privacy protection awareness). Additionally, hospital service culture and data center completeness are introduced as moderating variables to analyze their influence on data sharing intention and, ultimately, data sharing behavior.

A survey of 291 medical administrative teams from 63 hospitals shows that, inter-team collaboration significantly enhances data sharing intention. Leadership traits, including responsibility, proactive personality, leader-leader relationship, and privacy protection awareness, positively influence data sharing intention. Hospital service culture directly fosters data sharing intention and moderates the effect of inter-team collaboration, leader-leader relationship, and team leader's privacy protect awareness. Data center completeness does not directly affect data sharing intention but moderates the effect of inter-team collaboration, leader-leader relationship, and team leader's privacy protect awareness on data sharing intention. Data sharing intention is a strong predictor of data sharing behavior.

Theoretical and managerial contributions are discussed. A new micro-research perspective on healthcare data sharing is provided in theoretical research. The study also provides managerial insights for promoting medical data sharing in hospitals.

Keywords: healthcare data; data sharing; sharing intention; social exchange; social capital; planned behavior

JEL: H83; I10

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Resumo

Na era digital contemporânea, a partilha de dados de saúde tornou-se um imperativo crítico. Este estudo desenvolve um modelo integrado de três níveis "organização-equipe-liderança" para examinar os fatores que influenciam a intenção de partilha de dados entre equipas em instituições de saúde. Fundamentado na teoria da troca social, na teoria do capital social e na teoria do comportamento planeado, o modelo incorpora fatores em nível organizacional (cultura de serviço hospitalar, plenitude dos centros de dados hospitalares), fatores em nível de equipa (colaboração interequipas, escassez de recursos da equipa) e fatores ao nível da liderança individual (responsabilidade, personalidade proativa, relações líder-líder e consciencialização sobre proteção de privacidade). Além disso, a cultura de serviço hospitalar e a plenitude do centro de dados são introduzidas como variáveis moderadoras para analisar a sua influência na intenção de partilha de dados e, por fim, no comportamento de partilha de dados.

Uma pesquisa com 291 equipas administrativas médicas de 63 hospitais mostra que a colaboração interequipas melhora significativamente a intenção de partilha de dados. As características de liderança, incluindo responsabilidade, personalidade proativa, relacionamento líder-líder e consciencialização sobre proteção de privacidade, influenciam positivamente a intenção de partilha de dados. A cultura de serviço hospitalar promove diretamente a intenção de partilha de dados e modera o efeito da colaboração interequipas, do relacionamento líder-líder e da consciencialização sobre proteção de privacidade do líder da equipa. A plenitude do centro de dados não afeta diretamente a intenção de partilha de dados, mas modera o efeito da colaboração interequipas, do relacionamento líder-líder e da consciencialização sobre proteção de privacidade do líder da equipa na intenção de partilha de dados. A intenção de partilha de dados é um forte preditor do comportamento de partilha de dados.

Contribuições teóricas e de gestão são discutidas. Uma nova perspectiva de pesquisa em micro nível sobre a partilha de dados de saúde é fornecida na pesquisa teórica. O estudo também fornece contributos para a gestão no sentido de promover a partilha de dados médicos em hospitais.

Palavras-chave: dados de saúde; partilha de dados; intenção de partilha; troca social; capital social; comportamento planeado
JEL: H83; I10

摘 要

在当今数字化时代，健康医疗数据共享的重要性日益凸显。本研究构建了“组织—团队—领导”三层次整合模型，基于社会交换理论、社会资本理论及计划行为理论，探讨了多层次因素对医疗团队间数据分享意愿的影响。研究模型涵盖了组织层面（医院服务文化、医院数据中心完备度）、团队层面（团队间合作、团队资源稀缺性）以及领导个人层面（责任心、积极人格、领导间关系、隐私保护意识）等因素，并引入服务文化与数据中心完备度作为调节变量，分析其对数据分享意愿的影响机制，进而探讨对数据分享行为的影响。

研究样本包括63家医院的291个医疗团队，涵盖了不同地区和类型的医疗机构，以确保样本的多样性和代表性。通过问卷调查，本研究收集了关于团队间合作、团队资源稀缺性、团队领导个人特质、医院服务文化、数据中心完备度以及数据分享意愿和行为的相关数据。

研究结果表明，团队间合作显著增强了数据分享意愿，而团队资源稀缺性的影响不显著。团队领导的责任心、积极人格、领导间关系及隐私保护意识均显著正向影响数据分享意愿。医院服务文化直接促进数据分享意愿，并在团队合作、领导间关系及隐私保护意识对数据分享意愿的影响中起调节作用。医院数据中心完备度虽未直接影响意愿，但也在团队合作、领导间关系及隐私保护意识对数据分享意愿的影响中起调节作用。此外，数据分享意愿直接影响数据分享行为，表明提升意愿是促进行为的关键。

研究对结果进行了讨论，并深入探讨了研究的理论意义和管理学意义。理论意义在于拓展了健康医疗数据分享研究的视角，丰富了社会交换理论、社会资本理论及计划行为理论在医疗领域的应用。管理学意义在于为医疗机构促进团队合作、提升领导力、优化数据中心建设提供了具体的管理建议，有助于推动医疗信息化与数字化转型，提高医疗服务质量与科研水平。最后本研究讨论了研究的局限性以及对未来研究的展望。

关键词：健康医疗数据；数据分享；分享意愿；社会交换；社会资本；计划行为

JEL: H83; I10

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Chapter 1: Introduction

In the contemporary digital age, healthcare data sharing has emerged as a critical imperative. This study begins by contextualizing the current state of healthcare data sharing and identifying systemic challenges in its implementation. Building on this foundation, we formulate the research problem and clarify the study's objectives and scholarly contributions. Following this, a rigorous synthesis and evaluation of global research advancements is undertaken to consolidate existing theoretical frameworks, thereby anchoring this investigation within established academic discourse.

1.1 Research background

Data, as a valuable resource with immense potential, is increasingly gaining attention. Today, big data, open data, open science, and data sharing are rapidly evolving. With the swift advancement of networked information technology and the exponential growth of various types of data, data has become an extremely rich and valuable source of information. In the current era of rapid digitalization and informatization, data has penetrated every corner of society, including the healthcare sector.

1.1.1 The importance of healthcare data

With the widespread adoption and development of medical information systems, massive amounts of healthcare data have been digitized and systematically organized. As a critical asset in this field, healthcare data has become an essential national strategic resource, and its immense value is gradually being recognized and explored. Policies such as the “Guiding Opinions of the General Office of the State Council on Promoting and Regulating the Development of Healthcare Big Data Applications”, “Notice on Deeply Carrying Out the ‘Internet+ Healthcare’ Convenient and Beneficial Activities”, “Opinions of the General Office of the State Council on Promoting the ‘Internet+ Healthcare’ Industry Development”, and “Notice on Further Promoting the Development and Standardized Management of Internet Medical Services” have been successively issued, further highlighting the fundamental strategic importance of healthcare data. The “14th Five-Year Plan and the 2035 Vision Goals”

have also listed the digital transformation of the medical sector and the development of smart healthcare as key tasks. At the end of 2022, the National Health Commission, the National Administration of Traditional Chinese Medicine, and the National Disease Control and Prevention Administration jointly released the “14th Five-Year Plan for National Health Informatization”, emphasizing the need to actively build a healthcare data resource system, promote the development of healthcare big data applications, and fully unlock the value of data.

Healthcare data encompasses multiple aspects, including patient medical records, examination results, medication records, and treatment processes, playing a crucial role in disease prevention, diagnosis, treatment, and health management. China has already widely applied healthcare big data in various areas such as clinical decision support, disease early warning and diagnosis, personalized precision medicine, health management, public health emergencies, and public health literacy enhancement. For instance, AI-assisted screening of pulmonary nodules based on medical imaging data can effectively help medical professionals predict and diagnose lung cancer at an early stage, optimizing early treatment and significantly improving cure rates and survival rates.

Furthermore, in-depth mining and analysis of healthcare data can reveal disease prevalence trends, influencing factors, and prevention strategies, providing scientific evidence for public health policy-making. In terms of health management and public health literacy enhancement, integrating big data analytic with artificial intelligence can accurately identify target populations and their needs, enabling the provision of precise health services while greatly improving service efficiency and quality. In drug development, large-scale data analysis powered by AI can accelerate the discovery of new drugs, predict drug efficacy and side effects, and provide better treatment options for doctors and patients. This is the second paragraph any subsection.

1.1.2 The sharing of healthcare data

The immense value of healthcare data can only be realized through data sharing. Healthcare data sharing is a crucial step in maximizing the value of healthcare data. Shared healthcare data across institutions can resolve information access and exchange challenges in bidirectional referrals, improving collaboration and efficiency between healthcare institutions. In 2023, the Central Committee of the Communist Party of China and the State Council issued the “Overall Plan for the Construction of Digital China,” which emphasized the need to facilitate the large-scale circulation of data resources, promote the integration and utilization

of public data, and build national data resource repositories in key sectors such as public health, science and technology, and education.

In practice, healthcare data sharing activities predominantly occur among government agencies, healthcare institutions, research institutions, and healthcare enterprises. Governments can play a key role as promoters and regulators of data sharing, advances the interoperability and application of healthcare data by formulating relevant policies, regulations, and standards. Research institutions have an inherent demand for healthcare data sharing, with medical research data sharing being relatively mature. However, the most crucial participants are healthcare institutions, as they are the primary holders and controllers of vast amounts of patient healthcare data. Data sharing among healthcare institutions primarily targets healthcare services, operations, and research. By sharing examination and diagnostic results, electronic medical records, and other information, institutions can improve service coordination and efficiency. Thus, the internal data sharing status of healthcare institutions serves as a critical foundation for broader healthcare data sharing initiatives.

1.1.3 The problems of healthcare data sharing

As medical system informatization improves, data sharing within hospital-based healthcare institutions and across regional healthcare units also significantly progresses. The essence of "big data" is data itself. Compared to other industries, medical big data has distinct characteristics: the entire process of disease diagnosis and treatment essentially involves doctors collecting, analyzing, and processing patient data. While the medical industry has accumulated massive amounts of data, much of this data remains "static," stored passively in digital archives rather than being actively utilized across platforms. This has resulted in large-scale data centers being "idle" and underutilized. Due to fierce market competition and concerns about data security, healthcare enterprises remain relatively cautious regarding data sharing.

Healthcare data sharing is crucial for hospital development, as the continuous accumulation of data, as a valuable resource, supports medical research and enhances the quality of healthcare services. Hospitals serve as both the managers and executors of healthcare data sharing initiatives, while healthcare professionals, as the primary collectors and users of data, play an essential role in executing data sharing practices. Therefore, a key challenge in achieving data sharing is how to incentive different hospital departments to voluntarily share their data (Fang & Chiu, 2010).

However, several issues have emerged at this level. Some stakeholders lack awareness of the importance of healthcare data sharing, and the regulatory principles for data sharing remain underdeveloped. Additionally, different hospital departments hold varying attitudes toward data sharing, with some adopting a conservative stance, resulting in reluctance to share data. At present, whether in research institutions, healthcare institutions, or related enterprises, there is a widespread sense of hesitation and apprehension toward data sharing. Understanding the reasons behind this reluctance and exploring healthcare institutions' willingness to share healthcare data, along with the mechanisms involved, are crucial for overcoming obstacles in healthcare data sharing implementation.

1.2 Research question and significance

Current research on healthcare data sharing exhibits critical limitations in analytical perspectives. Most existing studies on healthcare data sharing in China focus on macro-level aspects, such as application scenarios for open data, technical solutions for data sharing, and theoretical and regulatory frameworks (Bu, 2023). The challenges of healthcare data sharing have largely been discussed in relation to data security, privacy protection, and incomplete information-sharing standards. However, few studies have examined data sharing from a micro-level perspective, particularly regarding the willingness and behavior of medical administrative teams in sharing the healthcare data they possess. Yet, this issue is fundamental to the successful implementation of large-scale healthcare data sharing and openness. Therefore, this study aims to investigate the healthcare data sharing among medical administrative teams, which have direct access to primary healthcare data, by considering organizational environmental factors and micro-level mechanisms. It seeks to explore how front-line "executors" of data sharing can overcome challenges and increase their willingness to share healthcare data.

1.2.1 Research question

Due to the lack of researches on specific barriers and incentives for intra-team healthcare data sharing. Critical factors such as inter-team collaboration, leadership traits, and organizational culture remain under-explored in promoting data sharing intention. To address these gaps, this study employs an "organization-team-leadership" multi-level model to examine how hierarchical factors influence sharing intentions within healthcare teams. It further analyzes the moderating effects of hospital culture and data infrastructure development, providing

empirical insights to advance theoretical and practical understanding of medical data sharing dynamics. Specifically, this study addresses the following key questions:

1. Do multidimensional factors (such as organizational, team, and individual factors) affect the sharing of healthcare data among the teams of the hospital?

2. Do organizational factors at the departmental level (such as hospital service culture and the completeness of hospital data centers) influence data sharing between teams?

3. In the context of inter-team healthcare data sharing within hospitals, does the data sharing intention promote sharing behavior?

1.2.2 Research implications

Despite advancements in healthcare data sharing policies and technologies, existing research predominantly focuses on inter-organizational data flow, with limited attention to specific barriers and incentives for healthcare data sharing. Systematic investigations remain lacking on how factors like team collaboration, leadership traits, and organizational culture influence sharing willingness. To address this gap, this study applies an "organization-team-leadership" multi-level framework to explore mechanisms shaping data sharing intentions of medical administrative teams, while examining the moderating roles of hospital culture and data infrastructure development.

For the theoretical contributions:

Micro-level insights. Diverging from macro-oriented studies, this research addresses the micro-level research gap by analyzing organizational healthcare data sharing among clinical teams, identifying organizational, team, and individual determinants of sharing behaviors.

Novel analytical lens. By integrating social exchange theory, social capital theory, and the theory of planned behavior within a multi-level framework, this study reveals critical drivers of sharing intentions and behaviors, offering fresh perspectives for healthcare data sharing research.

Mechanistic clarity. Through empirical analysis of the intention-behavior linkage and organizational moderators (e.g., service-oriented culture, IT infrastructure readiness), this work provides actionable strategies for optimizing data sharing mechanisms in healthcare institutions.

For the managerial implications:

Team management. Proposes evidence-based interventions such as performance-based reward systems and collaborative workflow redesign to enhance inter-team data sharing efficiency.

Leadership development. Identifies key leadership competencies (e.g., data stewardship, cross-team coordination) and recommends targeted training programs to cultivate sharing-supportive leadership styles.

Organizational optimization. Advocates for infrastructure investments in secure data platforms and cultural initiatives fostering trust-based collaboration, directly addressing practical challenges in healthcare data governance.

1.3 Research purpose and technical framework

Building on the identified research questions and objectives, this study systematically elaborates on the specific research components. Accordingly, the technical framework is established detailing the research process design.

1.3.1 Research purpose

Based on the literature on healthcare data sharing and data sharing, this study focuses on the specific sharing behaviors at the micro level within the macro institutional framework, exploring the sharing of health and healthcare data among medical administrative teams. The study investigates the mechanisms of health and healthcare data sharing between medical administrative teams, considering team factors, individual factors of team leaders, and situational factors at the organizational level. The specific research content includes:

1) Combining the content of health and medical big data open sharing with literature on data sharing intention and behavior to clarify the key variables of this study — the meaning and new contextual characteristics of data sharing between medical administrative teams.

2) At the team level, examining the impact of team factors on inter-team data sharing. The study selects two variables: team collaboration and team resource scarcity, to verify whether they influence inter-team data sharing behavior through the mediation of team data sharing intention.

3) At the team level, examining the impact of team leaders' personal factors on inter-team data sharing. The study selects variables such as responsibility, positive personality, interpersonal relationships, and privacy protection awareness to verify whether they influence inter-team data sharing behavior through the mediation of team data sharing intention.

4) Constructing a cross-level model to examine whether organizational factors—such as service culture, safety culture, and the completeness of hospital data centers—can moderate

the influence of team factors and team leaders' personal factors on inter-team data sharing intention.

The innovations of this study mainly lie in its focus on the micro-level implementation of macro-institutional concepts for the first time. Specifically,

1) This study focuses on the micro-level implementation of macro-institutional concepts, filling the gap in existing research in this area. It explores inter-team data sharing behavior within the context of the health and medical big data open-sharing system for the first time, providing a new perspective and research paradigm at the micro-level for the field of data sharing research. This innovative perspective breaks through the limitations of previous studies, which often focused on the macro-institutional level, offering a new entry point for understanding the actual operational mechanisms of health and medical big data open sharing.

2) This study focuses on the team level and investigates the influencing mechanisms of healthcare data sharing between teams, which differs from existing studies that mainly explore individual behavior regarding online healthcare data sharing. By starting at the team level, this study provides a more comprehensive understanding of the complexity and multi-dimensional influencing factors of healthcare data sharing in real-world healthcare settings, offering more targeted theoretical support for optimizing data sharing mechanisms among medical administrative teams.

3) This study examines the interactive effects of individual factors, team factors, and situational factors. By constructing a multi-dimensional model, it not only explores the direct impact of these factors on inter-team data sharing behavior but also analyzes the moderating role of different situational factors. This multi-dimensional, multi-level research design offers a more comprehensive understanding of the internal mechanisms of data sharing behaviors between medical administrative teams and provides scientific theoretical support for developing effective data sharing strategies.

1.3.2 Technical framework

Figure 1.1 shows the research technical approach.

First, the study reviews the relevant literature on health and healthcare data sharing, discussing the macro status of healthcare data sharing, data sharing intention, and influencing factors, which provides the theoretical foundation for the research.

Second, based on the literature and theoretical foundation, the study clarifies the concept of health and healthcare data sharing and relevant research on data sharing behavior,

identifying the meaning and new contextual characteristics of data sharing between medical administrative teams.

Third, the study conducts a survey at the team level, focusing on medical administrative teams.

Fourth, data analysis is performed to examine the impact of organizational factors, team factors, and personal factors of team leaders on team data sharing intention, and to verify the influence of data sharing intention on sharing behavior.

Fifth, the study examines whether service culture and the completeness of the hospital data center serve as organizational factors to moderate the process in which team factors and team leaders' personal factors influence data sharing intention.

Sixth, the study discusses the research findings, including the theoretical contributions of the research, the practical implications, as well as the limitations and future directions of the study.

Finally, the research summarizes and conclusions are drawn.

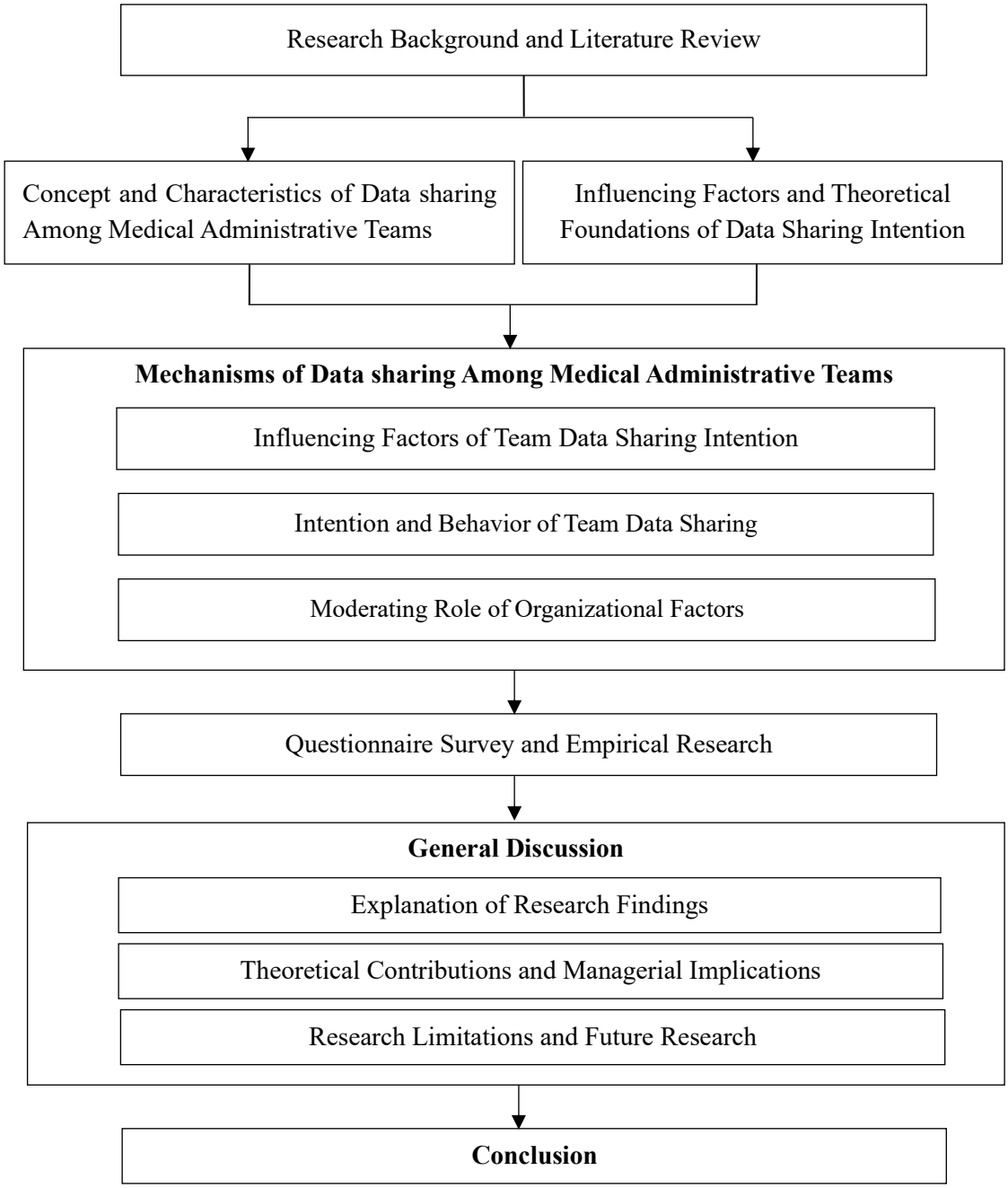


Figure 1.1 Technical framework of the study

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Chapter 2: Literature Review

This chapter delves into the theoretical underpinnings of healthcare data sharing, covering aspects like data resources, healthcare data, sharing intention, and sharing behavior. It then scrutinizes the factors influencing sharing intention and their theoretical basis, exploring how individual, team, and organizational factors effect sharing intention. A theoretical framework is built to underpin the subsequent research model and hypothesis development. Finally, it analyzes the development and research progress of China's healthcare data sharing, offering a foundation for this study.

2.1 Data and data sharing

The theoretical basis for medical data sharing includes aspects such as data resources, health and medical data, willingness to share, and sharing behavior.

2.1.1 Data resource

Data resources involve various collections of data that can be developed and utilized, and they are important strategic resources in modern society. Unlike traditional resources, data resources have the characteristic of being infinite. Data can be continuously generated and replicated, and will not be diminished through use as traditional resources would. The types of data resources are rich and diverse. Data from different fields, different businesses, and different formats constitute a vast system of data resources. In the research on sharing willingness and sharing behavior, specific content such as data sharing, information sharing, and knowledge sharing is involved. In research related to sharing willingness and sharing behavior, there are three interrelated concepts: data sharing, information sharing, and knowledge sharing. Data, information, and knowledge are fundamentally different from each other.

2.1.1.1 Data, information, and knowledge

Zack (1999) defined data as facts and observations obtained from a relevant context, while information is the result of placing data into a meaningful context. Bell (2005) further elaborated that data is arranged in a sequential order at a given time, such as an index of book

titles, whereas information is a contextualized combination of items that shows relationships between them, such as a thematic index of a book. From this perspective, information emphasizes the importance of context.

Davenporte (1998) noted that data is a careful and objective record of events, but it lacks inherent relevance or purpose. As a result, data itself is meaningless and cannot provide a basis for judgment, analysis, or decision-making. However, data serves as a crucial raw material for organizations to generate information. Information, in contrast, consists of meaningful data intended to adjust the recipient's perception of events and influence their judgment and behavior. Information is structured and organized for a specific purpose and is meaningful to the recipient. Typically, data is transformed into information through processes such as textualization, classification, computation, correction, and summarization.

Ren and Chen (2023) argued that in the digital era, personal information is reflected in personal data, and the two share a relationship of substance and form. In summary, data is directly obtained from various sources and generally refers to raw materials and original records. Information, on the other hand, consists of meaningful and structured data within a specific context. The key distinction between information and data is that information is analyzed data that is meaningful to a specific decision-maker.

Knowledge, however, differs significantly from data and information. Knowledge is a belief or value based on information that can generate predictions, establish causal relationships, or guide decision-making. Using the previous analogy, knowledge would be the thematic index constructed by a reader based on their understanding and judgment of a book. Knowledge is abstract and is generated through processes such as comparison, inference, connection, and discussion. Unlike data or information, knowledge undergoes a qualitative transformation and cannot be stored in a system in the same way; instead, it resides in human cognition.

Data, information, and knowledge form a continuum that reflects the level of human involvement and engagement in addressing real-world problems. Data requires minimal personal judgment, whereas knowledge requires the highest degree of personal judgment. Knowledge represents the application of individual judgment and is built upon contextual understanding or theoretical acceptance (Bell, 2005). Fundamentally, data and information are static, discrete, and fully transferable, while knowledge is dynamic, systematic, and only partially transferable. This inherent difficulty in fully transferring knowledge makes knowledge sharing one of the most challenging topics in the field of knowledge management.

2.1.1.2 Data elements

With data resources becoming the foundation of the digital economy, the concept of data elements has emerged and now serves as a fundamental concept for data sharing. Data elements, constituting the foundation of digitalization, networking, and intelligence, have become deeply permeated throughout processes such as production, distribution, circulation, consumption, and social governance. This integration is profoundly altering existing modes of production, lifestyle, and social governance. Within the digital economy, data elements are now comparable to traditional factors of production and act as the primary engine for its development.

Data elements refer to computer data and its derivative forms that are aggregated, organized, and processed according to specific production needs. Due to the characteristics of data—such as dispersion, diversity, ease of replication, and timeliness—data has become a new production factor. The effective circulation of data elements requires autonomous and orderly large-scale flow across systems, regions, industries, and entities. According to the China Academy of Information and Communications Technology, the process of data element value realization consists of three stages: data as resource, data capitalization, and data as asset.

The key characteristics of data elements include the following:

a) Diversified and Dispersed Sources. Data elements originate from a wide range of sources, including individuals, enterprises, governments, social organizations, and machine-generated data. These data sources include structured, semi-structured, and unstructured data in various forms.

b) Ease of Access and Dissemination. Data is easily replicate and, through multiple transmission channels, overcomes geographical and temporal constraints, making it highly fluid and accessible.

c) Coexistence of Privacy and Security Requirements. Data elements are characterized by the principle of “visibility equals exposure”, meaning that once data is accessed, there is a risk of leakage. The privacy and security of data affect personal privacy, corporate confidentiality, and even national security.

d) Timeliness. The value of data changes over time. The older the data, the lower its potential value, while newer data tends to be more research-worthy and forward-looking.

Today, as the most essential production factor in the digital economy era, data plays an undeniable role in social production and daily life. Data elements provide the foundation for

the development of new-generation information technologies such as artificial intelligence, big data, and the Internet of Things, and accelerate technological innovation and breakthroughs. By optimizing resource allocation, improving production efficiency, and promoting innovation, data elements drive high-quality economic development. The full realization of data element value depends on its effective circulation and sharing, which has become a widely accepted consensus.

2.1.1.3 Big data

Big data is more than just massive volumes of data. In 2008, the term "big data" was introduced in a special issue of *Nature* (Volume 455, Issue 7209), "Big Data: Science in the Petabyte Era" to distinguish it from traditional data. Though there is no precise definition, numerous descriptive concepts have emerged. The McKinsey Global Institute refers big data as a data set whose size exceeds the capabilities of traditional database software tools in acquisition, storage, management, and analysis. According to the research organization Gartner, big data require new processing models to enhance decision-making, discovery, and process optimization for massive, high-growth, and diverse information assets.

As data storage has increased exponentially, big data has shown great application value in business decisions, social governance, and scientific innovation.

By mining the value of multi-source heterogeneous data, strong evidence support can be provided for integrated healthcare reform. Overall, big data provides important support for building a learning and intelligent healthcare service system.

Bates et al. (2014) proposed that big data technology offers the potential to enhance management efficiency and service quality in integrated healthcare services. They also argued that big data can be used to evaluate the effectiveness of healthcare reform policies and provide a scientific basis for policy adjustments. Wu and Raghupathi (2012) suggested that big data can be used to analyze patterns of healthcare utilization and optimize the allocation of medical resources. They also believed that it is feasible to establish cost-prediction models based on medical record data for budget management.

2.1.2 Data sharing

Data sharing is a key part of the data-factor market and underpins the digital economy. In the big data era, it helps avoid duplicate data mining and is vital for unlocking data value and enabling its development and secondary use.

With the rapid development of information technology, the generation and accumulation of data are increasing at an exponential rate. Enterprises and organizations are confronted with vast amounts of data, which are dispersed across different departments, systems, and platforms. In the absence of effective sharing mechanisms, these data will form “data silos” and fail to fully realize their potential value. Data sharing can break down these barriers, enabling the circulation of data among different entities, thereby achieving the integration and collaborative utilization of data. Data sharing can also enhance the efficiency and effectiveness of data utilization. Through sharing, different departments and organizations can leverage their respective strengths to conduct in-depth analysis and mining of data, uncovering new value and application scenarios. In the medical field, hospitals can achieve more precise diagnoses and treatment plans by sharing patient data, thereby improving the quality and efficiency of medical services.

Due to the differences in the concepts of data, information, and knowledge, to some extent, the concepts of data sharing, information sharing, and knowledge sharing are also different.

2.1.2.1 Sharing of data

Research currently describe data sharing differently but with similar core meanings. Wang (2019) defines it as data exchange between different commercial organizations via platforms for business purposes, which is essentially different from government data disclosure. Fundamentally, data sharing involves others recollecting and using personal information. The personal information still belongs to the rights holders, so specific data-sharing rules should be designed to balance data circulation and privacy protection.

Data sharing focuses on the process of providing data resources from one or multiple sources to one or multiple users or systems (Zhang et al., 2020). During this process, data retains its original physical form or undergoes necessary format conversion to facilitate access and use by other users or systems.

The characteristics of data sharing include:

a) Originality. Data sharing typically involves raw datasets, which may be unprocessed and contain extensive details and potential information.

b) Diversity. Data exists in various formats, including structured data (e.g., tables in databases), semi-structured data (e.g., XML, JSON files), and unstructured data (e.g., text, images, audio, and video files). Data sharing must handle these different types of data.

c) Security. The data sharing process must ensure security and privacy protection to prevent unauthorized access or misuse.

d) Compliance. Data sharing must adhere to relevant laws, regulations, and industry standards to ensure legality and compliance.

2.1.2.2 Sharing of information

Information sharing refers to the process of transmitting processed or interpreted data (i.e., information) to other users or systems (Li, 2023). During this process, data is transformed into more meaningful, understandable, and usable forms. Yang (2019) categorized information sharing as a dynamic process that spans from information acquisition to dissemination, considering information-sharing behavior as the process by which users distribute the information they acquire to others.

The characteristics of information sharing include:

a) Processing. Information sharing involves processing and interpreting raw data to extract valuable insights, which may be presented in the form of charts, text, audio, or video.

b) Purposefulness. Information sharing typically has a clear objective, such as supporting decision-making or acquiring knowledge.

c) Timeliness. Information has a time-sensitive nature; timely sharing can help users or systems make more accurate decisions.

d) Interactivity. Information-sharing processes may include interactive elements such as user comments and feedback, which can further enrich and refine the shared information.

2.1.2.3 Sharing of knowledge

Knowledge sharing involves the dissemination and diffusion of knowledge between individuals. For example, knowledge sharing can be defined as the exchange of knowledge with others or a set of behaviors that provide knowledge assistance to others (Wang, 2008). Hansen and Avital (2005) define knowledge sharing as the voluntary act of an individual providing their unique experiences and knowledge to others, whether inside or outside an organization.

Knowledge sharing between teams can be described as a communication process involving the participation of two or more groups in the transfer of knowledge. It is a process where knowledge is provided by a source and then communicated to and received by one or more recipients. In other words, knowledge sharing can be considered a social interaction, composed of both human participation and the involvement of a medium. When these two essential elements coexist, knowledge sharing becomes more effective.

The characteristics of knowledge sharing include:

a) Transformation between Tacit and Explicit Knowledge. Knowledge sharing involves the conversion between tacit and explicit knowledge. Tacit knowledge is often difficult to articulate in words or text and must be transferred through practice, communication, and observation, whereas explicit knowledge can be clearly expressed and disseminated through documents, charts, and other media.

b) Continuity. Knowledge sharing is an ongoing process that continually enriches and expands the knowledge base of individuals and organizations through repeated exchanges.

c) Influence of Culture and Environment. The effectiveness of knowledge sharing is influenced by organizational culture and environmental factors.

2.1.2.4 Summary

Although data sharing, information sharing, and knowledge sharing have distinct concepts and characteristics, they exhibit significant similarities in motivation and behavior.

The consistency in willingness to share is manifested as follows:

a) Meeting Needs and Solving Problems. The motivation for sharing data, information, and knowledge often arises from the need to meet personal or organizational requirements and solve specific problems. For example, researchers may share data to support the studies of other scholars, employees may share information to facilitate teamwork, and experts may share knowledge to address industry challenges.

b) Socialization and Sense of Belonging. Social needs are a key driver of sharing behavior. Whether sharing data, information, or knowledge, the act can be seen as a form of social behavior that helps build and maintain interpersonal relationships. By sharing, individuals can demonstrate their expertise and insights, gaining recognition and respect from others, thereby enhancing their sense of belonging and fulfillment.

c) Self-Actualization and Achievement. Sharing behavior also reflects the need for self-actualization. When individuals or organizations receive appreciation and acknowledgment from others through sharing, they experience a sense of achievement and fulfillment. This positive feedback mechanism further motivates continued sharing behavior.

d) Learning and Growth. Data sharing, information sharing, and knowledge sharing are crucial for learning and growth. By sharing, individuals can continually learn and absorb new knowledge while improving their professional skills. For recipients, shared content provides valuable resources and experiences that accelerate their development.

The consistency in sharing behavior is manifested as follows:

a) Data sharing, information sharing, and knowledge sharing are typically proactive and voluntary behaviors. Sharers decide on the appropriate content and method of sharing based on their needs and intentions, making sharing behavior more flexible and efficient.

b) Sharing behavior often involves bidirectional communication and interaction. Sharers pay attention to recipients' feedback and responses, providing additional explanations or clarifications as needed. At the same time, recipients ask questions and express opinions, engaging in in-depth discussions and exchanges with sharers. This bidirectional interaction facilitates knowledge dissemination and deepening.

c) Data sharing, information sharing, and knowledge sharing all rely heavily on modern technology and platforms. Social media, professional forums, online databases, and other digital tools provide convenient channels for sharing. The continuous advancement of these technologies and platforms supports the widespread dissemination and deep integration of sharing behaviors.

In conclusion, data sharing, information sharing, and knowledge sharing all stem from the intrinsic motivation to fulfill personal or organizational needs, solve specific problems, build and maintain relationships, and achieve self-actualization. At the same time, they exhibit common characteristics such as pro-activeness, spontaneity, bidirectional interaction, and dependence on technology and platforms. Therefore, in related research, the influencing mechanisms and theoretical foundations of the three are highly consistent.

2.1.3 Institutional policies of data sharing

With the exponential growth of data storage, big data has shown great application value in many fields, and the importance of data sharing has become increasingly prominent. Many countries have made beneficial explorations in the sharing of health and medical data.

In February 2009, the U.S. passed the Health Information Technology for Economic and Clinical Health Act (HITECH), aiming to promote the widespread adoption of electronic health record (EHR) systems and enhance data sharing capabilities. Subsequently, the U.S. Department of Health and Human Services (HHS) launched HealthData.gov, a national health data open platform. In June 2014, the U.S. Food and Drug Administration (FDA) introduced openFDA, a data open platform.

In 2008, the EU began developing the "European patient smart open services" (epSOS), which was upgraded to the eHealth digital service infrastructure (eHDSI) in 2015. In February 2020, the EU Commission released the "European data strategy", emphasizing the growing importance of data in society and the need to establish a "single data market". In May 2022,

the EU Commission issued the “European Health Data Space (EHDS)” regulation proposal. On February 11, 2025, the EU passed Regulation 2025/327 to establish the EHDS. Its goals are to enhance individuals' access to and control over their electronic health data, promote data exchange and reuse for research and innovation, and improve the functioning of the internal market for electronic health record systems through a unified legal and technical framework.

In 2009, the UK launched data.gov.uk, a national data open platform. In 2012, the National Health Service (NHS) launched the care data program but had to terminate it in 2016 due to privacy and security concerns. Later, the UK introduced the General Practice Data for Planning and Research (GPDPR) program.

Since 2009, the United States and other countries have started promoting open and shared data platforms. In 2015, China first proposed the “national big data strategy”. To date, the State Council has issued multiple management measures to strengthen the application and development of health and medical data, providing policy support for data sharing.

2.1.3.1 International policies on data sharing

Internationally, data sharing has been continuously developing towards a more open, deeper, and diverse direction, with the premise of protecting privacy and ensuring data security. The release of initiatives, such as the 2002 Budapest Open Access Initiative, the 2003 Bethesda Open Access Publishing Declaration, and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities marked the beginning of the internationalization of data sharing. As data sharing practices evolve, the scope, fields, models, and extent of data sharing have reached new heights. In 2021, UNESCO's draft “Recommendation on Open Science” proposed the first global standard for open science, recommending member countries to take synchronized actions within seven areas specified in the recommendation according to international law and national conditions. This initiative also marked the start of the formalization of open science and data sharing (UNESCO, 2021). Open data sharing requires researchers to provide free access, usage, modification, and sharing of research data, adhering to the principles of academic freedom, research integrity, privacy protection, and data security.

To protect data sovereignty and promote the development of domestic data markets, countries have introduced various policies. In the U.S., the advanced information technology industry, along with abundant data resources, has contributed to a relatively mature data market. The U.S. has adopted mechanisms such as open government initiatives and the

development of diversified data transaction models to regulate the data market. In 2003, the U.S. National Institutes of Health (NIH) released its “Data sharing Policy”, requiring applicants for large research projects in specific fields to comply with related policies and regulations and propose the most suitable data sharing methods based on their research content and scientific norms. As data sharing practices continue to deepen, the advantages of open data sharing have become increasingly evident, receiving broad recognition from researchers for its substantial contribution to scientific research. Successive policies such as the “Genomic Data sharing Policy”, the “Intramural Research Program Human Data sharing Policy”, and the “NIH Policy on Dissemination of NIH-Funded Clinical Trial Information”, have responded to the demand for accessible high-quality data, reduced research costs, improved research efficiency, and enabled the translation of research results, proving that good data governance and sharing are win-win strategies (Gonzales et al., 2022).

Over the years, more organizations have provided cooperative networks to support data sharing between different research and bio-banks, such as the International Society for Biological and Environmental Repositories (ISBER) and Bio-banking and Bio-molecular Resources Research Infrastructure (BBMRI). In July 2017, the International Committee of Medical Journal Editors (ICMJE) published a clinical trial data sharing statement in top international medical journals like New England Journal of Medicine, The Lancet, and British Medical Journal, expecting shared research data without identification to become a norm (Taichman et al., 2017). To promote the development of data sharing and drive the progress of high-impact, cost-effective research, many funding agencies and collaborative groups have reached a consensus on the principles and goals for promoting medical research data sharing (Walport & Brest, 2011). For example, the European Prospective Investigation into Cancer and Nutrition (EPIC) project, involving 23 research centers from 10 European countries, includes a total sample size of 520,000 people (Bingham & Riboli, 2004).

To meet the increasing demand for more open, convenient, high-quality, and efficient data sharing, the NIH, based on its 2003 “Final NIH Statement on Sharing Research Data”, released the “Final NIH Policy for Data Management and Sharing” in October 2020. This policy, effective from January 25, 2023, turns all disciplines covered by NIH into a unified data system, making data sharing more diverse, comprehensive, and convenient. It advocates using FAIR-compliant databases for data management and openness, encouraging faster sharing and emphasizing respect for participants' autonomy, privacy, and confidentiality. In conclusion, the U.S. latest data sharing policy promotes a more open and flexible data sharing

model while ensuring data security and participant privacy. During the COVID-19 pandemic, the value of unrestricted data sharing has been clearly demonstrated.

In the new global context of data sharing, the EU holds certain advantages in data scale. To protect data sovereignty while promoting the circulation and sharing of data elements, the EU has proposed a digital space strategy for proprietary fields to facilitate the flow of data. The 2021 "Data Governance Act" of EU based on the General Data Protection Regulation (GDPR) for personal data protection, legislates the rights and responsibilities of stakeholders and proposes the creation of a "single data space" (Wu & Li, 2018). Through the construction of data sharing systems and portals, the EU has preliminary established a data sharing governance system aimed at enhancing public service capabilities. This system involves four key entities to achieve data reuse and sharing:

a) Public sector bodies, including regional government departments, responsible for producing, collecting, and opening vast amounts of data.

b) Data sharing service providers, responsible for trusted data sharing and neutral data-exchange services within the European data space.

c) Altruistic data organizations, where individuals or companies voluntarily provide data for public benefit, helping establish data pools that support data sharing in the public domain.

d) Data innovation committees, offering advisory support to the three entities above, facilitating the standardization and regulation of data sharing (Xiao & Su, 2022).

The policies and frameworks from the U.S. and the EU show that the international data sharing framework emphasizes protecting data security and privacy while significantly enhancing data sharing openness to meet the growing demand for accessible data. Research on emerging distributed ledger technology applications in healthcare has also been conducted, proposing a healthcare data sharing system integrating IoT (Internet of Things), IOTA Tangle (a decentralized, open-source distributed ledger technology designed specifically for the IoT), and MAM (Masked Authenticated Messaging) protocols. This system offers individuals a secure and controllable platform to share health-related data with hospitals, researchers, industrial companies, or other organizations, allowing individuals to benefit from their data in various forms while researchers and companies can collect relevant data for their research, clinical trials, or product development.

2.1.3.2 Chinese policies on data sharing

Under the trend and environment of internationalization and globalization of data sharing, the wave of data sharing has fully penetrated into many fields in China, such as the economy,

culture, education, science and technology, healthcare, and more. In recent years, China has introduced a series of policies on data elements at the national governance level, strengthened data security, proposed data ownership and standard specifications, and promoted data circulation. Various industries and fields in the country have also released various guidelines for data security, and domestic standardization organizations have been actively developing technical standards for data protection and data circulation, laying a standardized foundation for the data elements circulation market. Among them, the construction of data circulation in the medical field is also relatively leading. The data sharing activity has also achieved certain results in the field of healthcare, and a preliminary framework and standards for data sharing have been established.

At the national level, a data security legal system has been progressively established. Guided by the holistic view of national security, it is driven by core laws like the Civil Code, Data Security Law, and Personal Information Protection Law, and implemented through regulations such as the "Regulations on the Protection of Critical Information Infrastructure Security". In 2015, the State Council issued the "Action Plan for Promoting the Development of Big Data", aiming to build a unified government data opening platform by the end of 2018, with priority given to data sharing in fields like healthcare and transportation. In 2016, the General Offices of the CPC Central Committee and the State Council issued the "Opinions on Comprehensively Promoting Government Affairs Transparency", again emphasizing the construction of government data opening platforms and data openness in areas like people's livelihoods and market regulation. These platforms facilitate information exchange between the government and the public, promote a transparent, innovative, and service-oriented government, and support the digital and sharing economy by making government data available for use by enterprises, universities, and social organizations.

Although there's no special legislation for health and medical data, relevant normative documents and national standards have been issued. In 2016 and 2017, China launched two batches of pilot projects for health medical big data centers and industrial parks in provinces like Fujian and Jiangsu. These provinces, especially the pilot ones, have been accelerating legislation related to "big data". Guiyang City enacted the country's first local regulation on health medical big data, the "Guiyang Regulations on the Application and Development of Health Medical Big Data". It specifies the scope of application, proposes an integrity file system for the application and development of health medical big data, and clarifies supervisory duties. The "Shandong Province Health Medical Big Data Management Measures" standardizes the production, aggregation, sharing, opening, and security

management of health medical big data, and classifies data into non-open, conditionally open, and unconditionally open categories. The "Sichuan Province Health Medical Big Data Application Management Measures (Trial)" elaborates on security management, covering pre-event review, in-process control, and post-event accountability, and emphasizes the protection of legitimate rights and personal privacy.

2.1.4 Mechanism of data sharing

2.1.4.1 Sharing motive theory

Motivation is a psychological concept. It is an intrinsic excitement that initiates and sustains behavior, often shown as a desire to reach a goal. It stems from needs, converting into motivation when a need is intense enough and an object to satisfy it exists.

Motivation theory is key for explaining individual behavior. User behavior motivation can be external or internal. External motivation comes from outside, like money or punishment. Intrinsic motivation comes from within, driven by interest or enjoyment in the activity. It is believed that performance expectations, effort expectations, and social influences positively impact behavior intentions. Motivation theory, applied in psychology and management, explains employee work behavior.

Research on sharing motivation is extensive. Kwok and Gao (2004) found that economic and social incentives significantly affect knowledge-sharing participation. We can identify some key knowledge-sharing motivation factors include:

a) Self-enjoyment: People enjoy challenging tasks and see the fun as an intrinsic reward. In social networks, knowledge sharers seek self-enjoyment through interaction.
b) Self-efficacy: the belief in one's ability to perform specific behaviors. Sharers believe their knowledge is useful to others.
c) Learning: A main purpose of community participation is to stay updated and analyze information changes. The desire to learn encourages knowledge-sharing involvement.
d) Personal benefits: Gains from knowledge-sharing in a community can stimulate continued participation.
e) Altruism: Sharers see knowledge-sharing as beneficial to others. For example, programmers share code on open-source sites to aid others' learning.
f) Empathy: Sharers share knowledge to prevent others from falling into similar traps.

g) Community interest: Users with a sense of community belonging adopt its goals as their own and are motivated to enhance the quality of shared knowledge.

h) Social interaction: Humans are social and seek interaction and recognition in online settings.

i) Reputation: People aim for high status in their field. Knowledge-sharing boosts visibility and enhances reputation.

j) Reciprocity: It involves helping others with an expectation of return. In social networks, people may not expect direct reciprocity, but trust that others in the community will assist them when needed.

2.1.4.2 Theoretical basis of sharing mechanism

Several key theories for data sharing intention include social exchange theory, individual motivation theory, social influence theory, the theory of planned behavior, and social capital theory.

Social exchange theory

Social exchange theory effectively explains the motivational behaviors in social exchange processes and is widely applied in the field of data sharing research (Liu & Zhang, 2000). Data sharers evaluate the overall value of social exchange by comparing the benefits gained from sharing healthcare data with the costs incurred. This theory suggests that people tend to obtain valuable resources or rewards through exchanges in interactions. Such exchanges are not limited to material aspects but also include psychological aspects, such as support, self-esteem, and reputation. For example, collaboration between teams and relationships among leaders imply that sharers can gain these resources or rewards. The mechanisms of social exchange theory include:

a) Principle of reciprocity. Social exchange theory holds that relationships between individuals follow the principle of reciprocity. In data sharing, users expect to gain others' attention, recognition, knowledge, or other valuable resources by sharing their own information. This principle encourages individuals to share information as they believe sharing will bring some form of return (Park & Gabbard, 2018).

b) Resource exchange. Data itself is regarded as a valuable resource. When users perceive their information as valuable to others, they are more likely to share it in exchange for others' information, support, or goodwill. This exchange is not limited to direct data sharing but also includes building and maintaining social relationships. Additionally, data sharing fosters emotional connections between individuals. When users share personal experiences, opinions,

or feelings, they establish closer emotional ties with recipients, providing additional psychological rewards and motivating them to continue sharing.

c) Costs and benefits. Before deciding to share data, users conduct a cost analysis, which includes time investment, privacy risks, and potential negative feedback. If users perceive the cost to be too high, they may reduce their willingness to share. Corresponding to cost analysis is the expectation of benefits. Users evaluate potential gains from sharing, such as increasing social capital, enhancing personal reputation, or receiving useful feedback and suggestions.

d) Psychological rewards. Social exchange theory emphasizes the importance of psychological rewards, including recognition, respect, and trust. When users receive these non-material rewards through data sharing, they experience satisfaction and pleasure, strengthening their willingness to share.

Individual motivation theory

Individual motivation theory focuses on the driving forces behind an individual's data sharing behavior, which stem from personal needs, goals, or intrinsic motivations. This theory classifies benefit-related factors into extrinsic and intrinsic motivations. Extrinsic motivation is driven by expected outcomes or objectives, whereas intrinsic motivation involves sharing for internal satisfaction, such as enjoyment, pride, or challenge (Chen et al., 2017). The mechanisms of individual motivation theory include:

a) Intrinsic motivation. This refers to individuals engaging in activities due to the pleasure, satisfaction, or sense of achievement derived from them. In data sharing, intrinsic motivation may include sharing personal insights, experiences, or emotions for internal satisfaction and joy. If individuals believe sharing data brings them fulfillment and a sense of accomplishment, they are more likely to share. For instance, they may share professional knowledge to demonstrate expertise or share personal experiences to seek emotional resonance and support.

b) Extrinsic motivation. This refers to behaviors driven by external factors such as rewards, punishments, or social recognition. In data sharing, extrinsic motivation may include receiving material rewards, improving social status, or strengthening social relationships. When individuals believe that sharing data will bring external rewards or help them avoid penalties, they may be encouraged to share (Le et al., 2022). For example, interactions like likes, comments, and shares on social media can be seen as external rewards that motivate users to share more information.

Individual motivations are not isolated but rather intertwined and mutually influential (Zhao et al., 2016). Research on sharing willingness needs to consider the integration and

interaction of intrinsic and extrinsic motivations. For example, individuals may share both due to intrinsic enjoyment (e.g., the fun of sharing knowledge) and extrinsic incentives (e.g., gaining social recognition).

Social influence theory

Social influence theory explains how individuals are affected by others or groups in social environments, leading to changes in their attitudes and behaviors (Shen et al., 2011). It highlights both direct and indirect influences of social pressure, behaviors, or attitudes on individuals and is often used to explain the societal factors influencing specific behaviors. The mechanisms of social influence theory include:

a) Normative social influence. When individuals perceive social or group pressure, they tend to share data to conform to group expectations or gain recognition. This influence encourages individuals to align their attitudes and behaviors with the group, increasing their willingness to share. For example, on social media, when users see friends or followers sharing certain topics or information, they may be more inclined to share similar content to maintain group alignment.

b) Informational social influence. This aspect focuses on how information itself influences individuals. When people receive useful, interesting, or attractive information from others, they are more likely to share it if they believe it holds value for others. For example, users who read an insightful article or acquire valuable data may share it to attract others' attention or meet their informational needs.

c) Social identity and sense of belonging. Social influence theory also suggests that individuals seek social identity and a sense of belonging when sharing data. By sharing content that aligns with or is appreciated by a group, individuals can strengthen their connection with the group and enhance their self-identity and sense of belonging (Hong et al., 2021). For instance, in online communities or forums, users may gain more attention and recognition by sharing content relevant to the group's themes, thereby reinforcing their sense of belonging.

Theory of planned behavior

The theory of planned behavior is a social psychology framework for explaining and predicting human behavior. It is widely applied in information management research to understand and forecast individuals' information-sharing intentions (Zhou et al., 2020). The mechanisms of theory of planned behavior include:

a) Attitude toward behavior and data sharing intention. Individuals’ attitudes toward data sharing directly affect their willingness to share. If they perceive data sharing as beneficial,

enjoyable, or fulfilling, they are more inclined to share. Conversely, if they associate data sharing with negative outcomes (e.g., privacy breaches, wasted time), they may be less willing to share.

b) Subjective norms and data sharing intention. Social or group norms influence individuals' decisions on whether to share data. If people believe that important others (e.g., friends, family, colleagues) expect them to share data, or if they seek conformity with the group to gain a sense of belonging, they are more likely to share. Additionally, social media interactions such as likes and comments reinforce individuals' perceptions of subjective norms, affecting their sharing intentions.

c) Perceived behavioral control and data sharing intention. Individuals' perceived ability to share data affects their willingness to do so. If they feel they have the necessary skills and resources (e.g., digital literacy, time, tools) and anticipate minimal obstacles (e.g., internet issues, data inaccuracy), they are more likely to share. Conversely, if they feel incapable or foresee significant barriers, they may reduce their sharing behavior.

Social capital theory

From a social perspective, social capital theory is widely applied in analyzing factors influencing sharing intension (Li, 2021). The concept of social capital originates from economics, representing the total actual and potential resources accessible within a stable network. In academic research, it is common defined as intangible resources arising from interactions among group members, which individuals can utilize to create value. Kobayashi et al. (2006) defined it as the sum of resources individuals can obtain from specific social relationships to generate value, emphasizing relationship existence and potential value creation. Gitell and Vidal (2008) defined social capital as the potential resources, such as network size, norms, and external trust, can benefit an organization, highlighting network connections and factors affecting interactions. Zhao et al. (2009) defined it as the total actual and potential value that individuals and organizations can derive through network interactions. The content and mechanisms of social capital theory are as follows:

a) Content of the social capital

Social capital refers to individuals’ or groups’ ability to derive benefits from their positions, networks, and the resources embedded in these networks. It consists of three dimensions: structure, relationships, and cognition.

Structural social capital: refers to how network structures impact the overall value of social capital. Factors like network size, density, and an individual's position (e.g., degree centrality, eigenvector centrality) affect the value individuals derive from the network. Group

behavior is influenced by the value of the group's structure. Higher network density within a group indicates frequent interactions, making homogenizing behaviors more likely. An individual's network position determines their access to resources, and those with more accessible resources are more likely to interact with others (Goldenberg et al., 2011). Lee (2014) believes the quality of relationships between group members affects a group's social capital. Higher equivalence among nodes suggests more equal relationships and lower interaction costs, which facilitates interactions and increases value. Aral and Walker (2012) argue that an individual's position in the group affects their behavior. Higher centrality means more resource access and greater potential to contribute to the group, thus more social capital. The closeness of network relationships within a group promotes cooperative and innovative behaviors among members, driving the group’s development and value growth.

Relational social capital: differs from structural social capital. It focuses on the information value in individual interactions based on network relationships. Kogut (2000) noted that relational social capital arises from trust between users and identification with the group, which facilitates interaction and value transfer. This trust positively impacts group value creation. When individuals trust the organization and share common goals, they are more likely to offer help and resources. Fowler and Christakis (2008) emphasized that trust influences interaction intention. Even with network relationships, resource value is not generated without interaction intention. Reciprocity is also a key aspect. Dholakis et al. (2004) analyzed group value from short- and long-term interaction perspectives, indicating that mutual-benefit interactions make secondary interactions more likely.

Cognitive social capital: refers to the common language within a group and elements like shared goals, values, vision, and group identity that contribute to value creation. Adler defined it as the common communication methods and resources in a group that enhance interaction (Chiu et al., 2006). In terms of definition, structural social capital determines individual connections, relational social capital the timeliness of interactions, and cognitive social capital the awareness formation during interactions.

b) Social capital theory and sharing mechanisms

Social capital refers to individual or group ability to derive benefits from their positions, networks, and the resources embedded in these networks. It consists of three dimensions with key elements including social interaction, trust, and shared vision.

Network structure and information-sharing opportunities: The structure of interpersonal networks determines opportunities for sharing information. In tightly connected networks, information spreads more easily. For example, on social media, interactions like follows,

likes, and comments form complex relationship networks that create abundant opportunities for information sharing.

Trust and data sharing intention: Trust is crucial for data sharing. When individuals trust others, they are more willing to share their data (Chang & Chuang, 2011). On social media platforms, trust relationships develop through long-term interactions and shared interests, fostering greater willingness to share.

Norms and data sharing behavior: Social norms impose constraints on data sharing, requiring individuals to follow ethical guidelines such as privacy protection and copyright respect, ensuring an orderly and stable sharing environment.

Resources and data sharing ability: The resources individuals possess (e.g., data, information, knowledge) influence their ability to share. On social media, influential users with abundant resources can disseminate information widely, attracting more attention and enhancing their reputation (Wu & Kuang, 2021). By sharing valuable data, these users strengthen their social influence.

2.2 Research review of healthcare data sharing

The healthcare industry, one of China's early adopters of digitization and informatization, generates massive data continuously. The concepts like patient-generated health data (PGHD), observations of daily living (ODLs), and personal health information management (PHIM) are not neutral. They show different views on health, patient-provider relationships, and data states.

2.2.1 Healthcare data

Health and medical big data, driven by deep learning, data mining, and digital technologies like 5G, big data, and artificial intelligence, has caused a paradigm shift. It has evolved from individual data to a complex data ecosystem, expanding the scope of health-related data.

As a national strategic resource, health and medical big data influences lifestyles and provides health education, driving changes in healthcare models, improving medical standards and safety, reducing surgical risks, and lowering healthcare costs.

Under the policy of “Internet+”, healthcare services, wellness care, and health administration produce massive daily user data. This data, aggregated in centers, forms the health and medical big data that covers the entire human life cycle. It includes not only medical data like electronic health records and medical images but also life-cycle-related data

such as personal fitness and health monitoring data from wearables. Additionally, it encompasses data from health management agencies, pharmaceutical companies, and government departments, including infectious disease and population-related data.

Currently, there are various terms like “health data” and “personal medical information”. The concept of “health-related medical data” is also defined differently in laws, policies, and standards. Local legislation offers more detailed definitions, with most referring to “health and medical big data” to include both electronic and other data forms. Some definitions highlight the characteristics of health-related medical data, incorporate new technologies and business forms, or specify responsible entities. Esposito et al. (2018) defined medical-related big data as all data concerning health and daily life. Chai and Wang (2022) believe medical-related big data refers to all health-related data of natural persons from birth to death, including medical treatment information, case records, and personal health and physiological data. This definition also covers applicable health-related predictive data mining. Yang et al. (2022) stated medical-related big data is a data collection formed by the integration and coordination of universal medical-related resources such as people, objects, and information. Gu et al. (2022) thought medical-related big data refers to medical-related information resources distributed in various places like hospitals and communities. These resources have features like spanning time and space and being multi-granular. Ye et al. (2022) believed medical-related big data refers to a data collection generated during the entire life process of people, covering physiological and psychological aspects as well as disease prevention, diagnosis, treatment, and health management. Yang et al. (2019) considered medical-related big data as the data collection generated during medical-related activities or activities related to life and health.

Liu (2017) proposed that through the integration, analysis, and application requirement description of big data in the medical service field, relevant departments in the medical industry can be guided to strengthen the collection and management of medical big data, thereby laying a data foundation for later development and application. Xu (2015) designed and implemented a hospital big data collection, analysis, and application platform. Based on this platform, medical service functions were expanded, and a smart mobile medical information system based on big data was realized using big data analysis methods. This system provides a platform for medical information collection, medical information viewing, and medical data analysis, facilitating communication with ordinary patients.

2.2.1.1 Online health information

With the development of information technology, internet platforms based on health and healthcare data have become increasingly active. Online health communities, health websites, health apps, online hospitals, online healthcare institutions, and social media platforms all facilitate the publication and sharing of health-related information. Online health platforms are not restricted by time or location, allowing them to meet diverse needs (Zhang et al., 2017). Users can obtain knowledge and advice from doctors regarding health risk assessments, disease prevention and diagnosis, and treatment recommendations. Additionally, they can communicate with patients who have experienced similar health issues (Oeldorf-Hirsch et al., 2019). As a result, online health platforms are increasingly regarded as an essential means of acquiring health knowledge, making research on online health information sharing highly relevant.

In general, online health information encompasses all knowledge, techniques, skills, concepts, and behaviors related to health communication that are created, transmitted, and shared between senders and receivers. In simpler terms, it refers to information related to people's health, diseases, nutrition, and wellness (You et al., 2023).

The sharers of online health information include both professionals, such as doctors and expert scholars, and general users. According to You et al. (2023), health information can be classified by credibility into false health information, distorted health information, and authentic health information. Based on topic type, it can be categorized into wellness and healthcare information, health crisis information, and specific disease information.

A successful online health information platform relies on active data sharing. Many studies emphasize the importance of motivation in knowledge sharing across various online communities. However, research on the influencing factors of online health information sharing remains relatively limited (Zhang et al., 2017). Online health information platforms help individuals improve their health and well-being by providing access to specific disease information, treatment options, and shared experiences. Therefore, morality-related motivations are considered potential factors that promote data sharing (Zhang et al., 2017). For example, extrinsic motivation—such as reciprocity—has been found to be positively correlated with knowledge sharing in electronic networks (Wasko & Faraj, 2000).

2.2.1.2 Health and healthcare data

The definition and scope of health and healthcare data vary across different documents and scientific studies.

According to the "National Health and Medical Big Data Standards, Security, and Service Management Measures (Trial)" issued by China's National Health Commission in September 2018, "health and medical big data" refers to data related to health and medical care that is generated during the processes of disease prevention, treatment, and health management.

The national standard GB/T39725-2020, "Information Security Technology-Health and Medical Data Security Guide", released in 2020, defines health and medical data as personal healthcare data, as well as electronic data derived from processing personal health and healthcare data. Personal health and healthcare data refer to electronic data that, either alone or combined with other information, can identify a specific individual or reflect their physiological or psychological health status.

In the GDPR issued by the EU in 2018, "data concerning health" is defined as all personal data related to an individual's physical or mental health, including data provided by healthcare services that indicate their health status (Chen, 2023).

Personal Health Records (PHRs) are systems for individuals to maintain and manage their health data. They allow not only personal access but also viewing by doctors or others with permission. PHRs help individuals regulate daily exercise, diet, and mood, and provide comprehensive health information for doctors during illness, facilitating treatment.

Initially, PHRs relied on medical devices for data collection, displayed and stored on PCs, limiting access to health data. In the mobile internet era, widespread use of mobile and wearable devices enables real-time health status recording via smartphones or wearables. This allows for more comprehensive health data collection and cloud-server uploading. Doctors can then view this data, reducing routine checks and enabling them to focus on diagnosis and treatment.

In summary, research suggests that health and healthcare data not only include diagnostic and treatment-related data generated due to illness, but also non-diagnostic healthcare data generated through daily life activities. Some definitions of "health and medical big data" further include data related to medical management, the health industry, and industry regulation arising from individuals' participation in health and medical activities (Chen, 2023). Thus, "health and medical data" can be defined as data related to health and medical care that is generated during individuals' disease prevention and health management processes.

This study posits that original personal healthcare data within the healthcare system, once processed according to relevant regulations, can become shareable healthcare data.

2.2.2 Healthcare data sharing

Big data is profoundly changing remote healthcare by integrating broader patient information, thereby enhancing the accessibility and quality of medical services (Coakley et al., 2015).

2.2.2.1 Challenges of healthcare data sharing

At present, there are certain challenges and difficulties in the sharing of health and medical data. On the one hand, conducting medical data sharing requires gaining people's trust and obtaining social permission; On the other hand, key issues such as difficulty in ensuring privacy and security, unclear data ownership, and unclear distribution of benefits have become obstacles to the development of medical data sharing. The latter becomes the foundation for solving the problems mentioned in the former.

During the transmission of data, there is inevitably a risk of leakage, and for the field of medical data sharing, the data contains a large amount of personal information. Once leaked, it will inevitably pose a threat to people's lives; Therefore, how to better protect privacy in the process of medical data sharing is an important prerequisite for health and medical data sharing. In practical practice, due to the lack of privacy laws, it is difficult to share health data, so it is necessary to improve relevant laws to promote the sharing of health data.

A study on medical data sharing in Europe found that hundreds of trials were conducted on institutional reports from multiple countries, and the results showed that factors such as privacy protection and ethical issues largely limited the data sharing behavior of European radiologists in imaging trials (Fecher et al., 2015). Zhao et al. (2013) studied the ethical issues surrounding the sharing of precision medical health data and found that public trust in data security systems and governance systems can enhance participation in medical data sharing.

2.2.2.2 Research on healthcare data sharing technology

The development of information technology is a key factor influencing the sharing of medical data. The degree of integration between information technology and the field of medical data sharing determines the progress in this area. A study has proposed a novel multi-party homomorphic encryption technology by integrating homomorphic encryption with secure multi-party computation. Compared to using homomorphic encryption or secure multi-party computation alone, this technology offers better protection of data privacy during the sharing of medical data (Scheibner et al., 2021). Currently, there are medical data sharing systems based on attribute-based encryption. These systems allow patients and medical staff to securely and efficiently share medical data on the medical internet. There are also medical

data sharing systems driven by block-chain technology and patients. These systems not only enable patients to take the lead in data sharing but also provide necessary security features to ensure the proper protection of medical and health information. Some scholars have proposed a platform that helps people build and share medical algorithm graphs, through which users can communicate and share vital information in the areas of medical diagnosis, disease prevention, and treatment (Jukan et al., 2020).

2.2.3 Analysis of factors affecting healthcare data sharing

The factors of affecting healthcare data sharing can be concluded as three research areas, including institutional constraints in healthcare data sharing, factors affecting online health information sharing, and general information sharing factors.

2.2.3.1 Institutional constraints in healthcare data sharing

Research on healthcare data sharing often focuses on institutional challenges. In China, barriers in the open sharing of healthcare data primarily involve the following institutional constraints:

a) Lack of clear legal frameworks. Studies highlight several issues, including unclear ownership of healthcare data, challenges in privacy protection both technically and administratively, and a lack of unified data sharing directories, standards, and protocols. Controlling information security risks remains difficult, and there is a shortage of technical expertise and funding (Xu & Yu, 2020). Additionally, legal standards for data storage, analysis, and application are lacking, and the definition of healthcare data ownership is still unclear (Peng et al., 2024).

b) Under-utilization of technology for data sharing. Some research proposed a medical archive data sharing system based on big data, emphasizing the technology's potential to address the imbalance in supply and demand in healthcare services (Bu, 2023). This technology can meet the needs of various sectors, improving healthcare efficiency and reducing disease incidence and transmission risks.

c) Insufficient incentives in hospital data sharing. Liu and Zhang (2020) analyzed factors hindering internal knowledge sharing in public hospitals in Shanghai. They found that high sharing costs, lack of trust, absence of targeted incentives, and insufficient team diversity could hinder internal knowledge sharing. Suggested improvements include lowering costs, establishing common goals, offering incentives, and seeking external partnerships.

2.2.3.2 Factors affecting online health information sharing

In the realm of healthcare data, one key concept is online health information sharing, closely tied to current advancements in information technology. This concept is integral to the development of data sharing platforms.

Research on online health information sharing often focuses on online health communities, exploring the individual motivations and social capital that influence one's willingness to share health information. Studies have increasingly examined social media and its impact on health information sharing, addressing factors such as sharing behavior, health information types, characteristics of sharing groups, and functions of sharing platforms. The most significant focus has been on identifying the influences on sharing behavior, including: sharing willingness, health literacy of users, social networks in virtual communities, information quality and usefulness, altruism, self-interest and reward mechanisms (You et al., 2023).

Li and Wen (2023) through meta-analysis, identified 19 variables that significantly influence the intention to share healthcare data. Key factors include sharing attitude, social norms, social interaction, altruism, self-efficacy, reciprocity, reward, perceived benefit, and healthcare data sharing intentions. Other moderately correlated factors include perceived ease of use, usefulness, behavior control, social identity, information support, emotional support, trust, shared vision, empathy, and online reputation, among others. In contrast, disease severity shows a weak correlation with sharing intention.

Key factors influencing healthcare data sharing intentions are listed in Table 2.1, covering platform features, personal perceptions, reward factors, social traits, and concerns about data sensitivity and privacy.

Table 2.1 Main variables affecting healthcare data sharing and their definitions

No.	Variable	Meaning
1.	Perceived Ease of Use	The perceived ease of operating an online health information sharing platform.
2.	Perceived Usefulness	The perceived ability of the platform to improve life or work performance.
3.	Sharing Attitude	An individual's positive or negative evaluation of sharing online health information.
4.	Perceived Behavioral Control	The individual's sense of control over their information sharing activities.
5.	Subjective Norm	The social pressure perceived by an individual to share or not share health information.
6.	Social Identity	The extent to which an individual identifies with their group in terms of cognition, emotion, and evaluation.
7.	Information Support	Providing advice, knowledge, and recommendations to help community members solve problems.

No.	Variable	Meaning
8.	Emotional Support	Emotional care, including understanding, empathy, trust, and love, provided to members.
9.	Trust	Trust in the platform or other members to not misuse personal information.
10.	Shared Vision	The extent to which platform members share common perspectives, goals, or objectives.
11.	Social Interaction	Frequency, time, and relationship strength of interactions among platform members.
12.	Empathy	The ability to understand others' feelings or situations.
13.	Altruism	Helping others and enhancing their welfare without expecting a return.
14.	Self-Efficacy	The confidence in an individual's ability to provide valuable information to others.
15.	Reciprocity	The belief that information sharing will lead to mutual benefits among members.
16.	Rewards	Material rewards such as monetary incentives or job promotions for sharing health information.
17.	Online Reputation	The respect or professional self-image gained from sharing health information online.
18.	Perceived Benefits	The external or internal rewards, such as financial returns, recognition, or knowledge, gained by sharing healthcare data.
19.	Perceived Risks	Risks associated with sharing health information, such as privacy, time, and social risks.
20.	Information Sensitivity	The perceived sensitivity of the health information shared.
21.	Privacy Concerns	The attention given to privacy disclosure in the online health environment.
22.	Perceived Vulnerability	The belief about the likelihood of being affected by the health problems described in shared healthcare data.
23.	Perceived Severity	The perception of how severe the health issues described in shared data are.
	Disease Severity	The self-perception of the severity of one's health condition.

Source: Li and Wen (2023, p. 128)

However, conclusions regarding these factors may vary across studies. For instance, privacy concerns can either positively or negatively influence health information sharing intentions, depending on the research context. Zhu G et al. (2023) found that privacy concerns positively influence users' intention to share personal health information on mobile platforms, while Zhu P et al. (2020) found the opposite effect in online patient communities.

2.2.3.3 General information sharing factors

The study of information sharing is relatively mature and typically considers both individual and situational factors.

a) Individual factors

Personal traits (e.g., anonymity, openness) influence sharing behavior. It is believed that traits like self-efficacy and openness promote sharing, while shyness and reluctance hinder it.

Motivations: Internal motivations like altruism and external ones like gaining prestige or rewards drive sharing.

Trust: It is believed that trust plays a crucial role in promoting information sharing by eliminating communication barriers.

b) Situational factors

Community and organizational context: Trust in virtual communities and a fair and supportive organizational culture enhances sharing willingness.

Information characteristics: The relevance, reliability, and timeliness of information affect sharing behavior in virtual environments.

Information sharing behavior characteristics: Research into information-sharing behavior in social networks and virtual communities has shown that platform functionality, emotional ties, and information content characteristics significantly impact sharing behavior.

2.2.3.4 Summary of factors affecting healthcare data sharing in Chinese institute

Overall, external factors affecting medical data sharing for Chinese healthcare institutions mainly consist of the following: Policy and regulatory factors, as China's laws like the "Data Security Law" and "Personal Information Protection Law" impose strict requirements on data management, somewhat restricting free data sharing. Technical factors also play a role, with challenges such as lack of unified data standards and security risks during data transmission, impacting the intension to share data. Additionally, social and cultural factors, like patients' privacy concerns and insufficient awareness of data sharing's value, also hinder the promotion of medical data sharing.

Institutional factors: Regulatory constraints, including incomplete legal frameworks, ambiguities in data ownership, and insufficient privacy safeguards, critically limit the scope and efficiency of healthcare data sharing.

Contextual factors: Platform characteristics, organizational climate, and external environments significantly influence sharing outcomes. Social norms, interpersonal networks, and cultural values shape individual sharing decisions, while technological advancements (e.g., mobile internet proliferation, social media adoption) enable rapid health information dissemination. Critical events, such as public health emergencies, may trigger large-scale data sharing behaviors.

Informational factors: Data attributes—including accuracy, relevance, readability, novelty, and emotional resonance—directly affect sharing intentions. Platform features like perceived ease of use and perceived usefulness further enhance sharing engagement.

Internal sharing mechanisms within medical administrative teams are primarily governed by individual-level determinants that influence members' intention and extent of participation.

Individual barriers: Privacy concerns, data security risks, and cost-benefit calculus dominate personal sharing decisions. Empirical evidence highlights altruism and self-efficacy as pivotal social traits shaping sharing behaviors.

Cognitive-motivational dimensions: Health consciousness, topic-specific interests, self-efficacy, and sharing motivations (e.g., social support, self-expression) constitute critical internal drivers of medical data sharing practices.

This study investigates potential relationships between selected variables and healthcare data sharing intentions/behaviors within teams. Given the scarcity of directly relevant prior research, variables were derived from conceptually analogous constructs in knowledge-sharing theory.

2.3 Data sharing between medical administrative teams

The healthcare data administrative department serves as the core responsible unit for the data management and sharing platform, providing institutional, technical, and security support to meet the data sharing needs of clinical, research, and other teams. Therefore, this study focuses on the data sharing behaviors of the medical administrative teams. The sharing of healthcare data between these teams is not only influenced by macro factors, but also by micro level factors. Overall, macro factors include the policy system, management level, and completeness of information technology in the sharing process. In addition, whether the technical level can support standardized construction of interoperability is also a crucial factor. At the same time, it is important to consider whether the infrastructure is reliable enough, whether data can be smoothly shared between departments, and whether the technology is compatible. These factors are crucial for promoting cross department data sharing.

At the micro level, trust is an important factor affecting cross departmental data sharing, which can lead to concerns among departments about the misuse of data by other departments. Gil-Garcia et al. (2010) identified “level of understanding of participating organizations”, “exercise of power”, and “clarity of roles and responsibilities” as the three core factors determining the trustworthiness of cross department data sharing plans by analyzing independent cases in data sharing initiatives.

Based on the concepts and theories discussed above, this study focuses on data sharing among medical administrative teams, which refers to the process of exchanging, integrating, and utilizing various healthcare data generated during patient care among different medical administrative teams within the same medical institution or department. These data include, but are not limited to, patient medical records, diagnostic information, test results, medication records, and medical imaging data.

2.3.1 Characteristics of data sharing between medical administrative teams

The characteristics of data sharing among medical administrative teams include:

a) Diverse data types. Data sharing among medical administrative teams involves a wide range of data types, including text, numerical values, and images. For example, it encompasses basic patient identity information, biochemical test data, and imaging data such as electrocardiograms (ECG), ultrasound scans, magnetic resonance imaging (MRI), and computed tomography (CT) scans. The diversity of these data necessitates a highly compatible and flexible data sharing process.

b) High sensitivity and privacy protection requirements. Healthcare data contain personal and sensitive patient information. Therefore, strict compliance with relevant laws, regulations, and ethical guidelines is essential to ensure data security and privacy protection. Healthcare institutions must implement effective technical measures and policies to safeguard patient privacy and maintain data security.

c) Enhancing service quality and efficiency. Data sharing among medical administrative teams helps eliminate information silos, thereby improving the overall quality and efficiency of healthcare services. By sharing data, physicians can gain a more comprehensive understanding of a patient's condition and medical history, enabling them to develop more precise and personalized treatment plans. Additionally, data sharing facilitates the optimal allocation and utilization of medical resources, reducing redundant tests and treatments, and ultimately lowering healthcare costs.

d) Collaboration and coordination across departments. Data sharing among medical administrative teams involves multiple stakeholders, including healthcare institutions, government regulatory bodies, and data users. Therefore, effective collaboration and coordination among different departments are essential to successfully promote and implement data sharing initiatives.

2.3.2 Factors that affect data sharing between medical administrative teams

The factors that affect data sharing intention are discussed from team factors, individual factors and organizational factors.

2.3.2.1 Team factors

In this study, the team factors that affect data sharing intention include:

a) Inter-team collaboration. This study focuses on inter-team collaboration in medical settings (Hu & Liden, 2015), which refers to the process in which different teams coordinate, cooperate, and work together toward shared goals or interests. Through this collaboration, teams achieve resource sharing, complementary advantages, shared risk-taking, and collective benefits. Effective inter-team collaboration is built on mutual trust and respect, establishing common goals and visions, sharing resources, and leveraging each other's strengths. The process requires effective communication and coordination to jointly assume and address risks.

b) Resource scarcity in teams. In the context of healthcare data sharing, resource scarcity refers to the limited availability of healthcare data controlled or accessible by a team. This limitation means that the total volume of data is insufficient to meet all demands or can only partially fulfill those needs in a constrained manner.

2.3.2.2 Individual factors of team leadership

In this study, individual factors of team leadership that affect data sharing intention include:

a) Sense of responsibility. The sense of responsibility of medical administrative team leaders refers to their awareness, emotions, and beliefs regarding the duties and tasks they undertake, as well as their commitment to complying with norms, assuming responsibility, and fulfilling obligations. This mindset encourages leaders to maintain a high level of responsibility and professionalism in their work, ensuring the successful completion of tasks and the achievement of team goals.

In medical administrative teams, the sense of responsibility of leaders is particularly important. It is not only related to an individual's professional quality but also directly affects the cohesion of the team and the quality of medical services. A strong sense of responsibility prompts leaders to maintain a high degree of professionalism in their work. It also helps to enhance the cohesion and execution ability of the team. A responsible leader can earn the trust and respect of team members, thereby stimulating their enthusiasm. Leaders need to lead by example and set a good example. By their own words and deeds, they can convey a sense of

responsibility and professionalism to team members, encouraging them to also maintain a high sense of responsibility in their work. By clarifying job responsibilities, formulating reasonable work plans, and supervising the implementation, leaders can ensure that team members perform their respective duties, cooperate with each other, and jointly achieve team goals.

b) Proactive personality. A proactive personality in medical administrative team leadership, also known as a prosocial value orientation (Grant & Rothbard, 2013), describes an individual's tendency to take initiative and exert effort in shaping and changing their environment. Leaders with this trait not only proactively identify and seize opportunities but also persistently pursue their goals, taking active steps to influence and modify their surroundings. Such individuals are more likely to adopt proactive measures rather than passively accept or avoid challenges and uncertainties.

In medical administrative teams, the positive personality of leaders is particularly important. It not only affects an individual's career development but also has a profound impact on the team's cohesion and the quality of medical services. Big data has brought new opportunities and challenges to the medical field. Leaders with positive personalities can actively identify opportunities, including the application of new technologies, the initiation of new projects, or the promotion of new services. Such leaders are not only able to seize these opportunities but also actively drive the team to achieve these goals. Leaders with positive personalities can take proactive actions to influence and change the surrounding environment. They do not passively accept the status quo but actively seek ways to improve. Therefore, in the work of medical data sharing, leaders with positive personalities are more likely to promote implementation.

c) Relationships among leaders. The relationship among team leaders adopts Leader-Leader Exchange (LLX), which is an emerging concept in the fields of organizational behavior and management in recent years. Its theoretical foundation is derived from the classic Leader-Member Exchange (LMX) theory (Graen & Uhl-Bien, 1995). The LMX theory primarily focuses on the relationship between leaders and subordinates (members) and its impact on job performance and organizational effectiveness. In contrast, LLX extends the research perspective to the interaction, communication, and collaboration processes among leaders in medical administrative teams. This exchange may involve multiple aspects, such as information sharing, decision-making, resource allocation, and strategic coordination.

In medical administrative teams, the relationships among leaders have a profound impact on the overall effectiveness of the team and the quality of medical services. First, information

sharing is an essential component of LLX. Leaders in medical administrative teams need to share key information such as patient data, the use of medical resources, and the latest medical technologies in a timely and accurate manner. This kind of information sharing can help team members coordinate their work better and avoid problems caused by repetitive work and information asymmetry. Moreover, resource allocation is also a crucial part of LLX. The rational allocation of medical resources is vital for improving the quality and efficiency of medical services. Leaders need to communicate and collaborate effectively to ensure that resources are allocated reasonably according to actual needs. Lastly, strategic coordination is an important means to enhance the overall effectiveness of the team. Leaders in medical administrative teams need to reach a consensus at the strategic level to ensure that the team's work objectives and directions are aligned. All these aspects lay the foundation for the sharing of medical data.

d) Awareness of privacy protection. The awareness of privacy protection refers to the recognition, emotions, and beliefs that individuals or organizations hold when dealing with personal privacy information, as well as the conscious attitude of complying with regulations, respecting privacy, and fulfilling obligations accordingly. In the medical field, the awareness of privacy protection is particularly important.

Medical data is highly sensitive and involves patients' personal privacy and health information, and its leakage may lead to serious consequences. Since healthcare data involve privacy protection and security management, team leaders must possess a strong awareness of privacy protection (Li, 2022). This includes strictly adhering to data sharing regulations, emphasizing data security management, respecting patient privacy, and establishing relevant contingency plans. The improvement of privacy, confidentiality, and consent management in the existing medical data sharing system can significantly enhance the security and compliance of data sharing. Some novel "privacy gradient" health data governance method was proposed that considers data sensitivity, stakeholder relationships, usage purposes, and time factors to make privacy protection more flexible and contextualized, effectively addressing privacy challenges in the global healthcare environment, enhancing patient engagement, improving nursing coordination, and accelerating medical research.

The awareness of privacy protection for medical data is a key factor in ensuring data security and compliance management. The sensitivity of medical data requires that team leaders must have a high degree of awareness of privacy protection to ensure the security of data during the processes of collection, storage, processing, and sharing. By assessing the sensitivity of data and adopting flexible privacy protection measures to adapt to the needs of

data sharing in different contexts, team leaders can effectively promote the sharing of medical data.

2.3.2.3 Organizational factors

Organizational factors affect data sharing intention that we focus including:

a) Service culture. Service culture refers to the values and professional beliefs developed by healthcare institutions over time through their service provision to patients (Chen, 2004). It represents the organizational culture of hospitals in the service domain, influencing service quality, institutional reputation, and the logical thinking and behavioral patterns of employees.

The service culture holds irreplaceable significance within medical institutions, directly impacting patient satisfaction, hospital reputation, and employee enthusiasm. The establishment of a service culture necessitates the participation and practice of all staff members, enhancing their sense of identification, belonging, and proactivity, thereby fostering their recognition of hospital policies. Through clear values and behavioral norms, the service culture aids employees in understanding the hospital's mission and objectives. When employees perceive their work as aligned with the hospital's overarching goals, they are more inclined to accept and adhere to hospital regulations, thus more actively engaging in data-sharing behaviors.

b) Completeness of the hospital data center. Currently, healthcare data are primarily shared through hospital platforms, necessitating the establishment of hospital data centers to support healthcare data sharing (Liu & Zhang, 2020). Ji and Lyu (2024) emphasized that the lack of a unified machine-readable standard makes it difficult to convert and share phenotype algorithms for electronic health records (EHR), thereby limiting the large-scale development of precision medicine. The completeness of a hospital's data center affects the ease of data sharing among medical administrative teams and reflects the maturity of related management systems.

Lee and Aswani (2022) proposed that due to privacy breaches and identification risks in the process of medical data sharing, medical institutions adopt a cautious attitude towards data sharing. By designing optimal cybersecurity insurance contracts, medical institutions can be encouraged to share data responsibly, thereby promoting medical research and technological development. The deep integration of Industry 4.0 and healthcare, especially during the COVID-19 pandemic, has effectively improved patient record tracking and data transparency through the application of technologies such as the Internet of Things, block-chain, big data, and cloud computing.

2.3.3 Mechanisms influencing data sharing intention

This study examines the mechanisms influencing data sharing intention through three dimensions: team factors, leadership factors, and organizational factors.

2.3.3.1 Team factors affecting data sharing intention

The impact of inter-team collaboration on the willingness to share healthcare data in hospitals can primarily be explained through social exchange theory and social capital theory.

According to social exchange theory (Liu & Zhang, 2020), collaboration between medical administrative teams is essentially a process of resource exchange. When teams share data (e.g., patient medical records, imaging data) to obtain complementary resources from other teams (e.g., expert opinions, optimized treatment plans), this reciprocal relationship enhances the willingness to share. For example, sharing real-time patient monitoring data between the emergency department and the intensive care unit enables the rapid development of rescue plans, significantly improving treatment efficiency—where the "benefit" outweighs the coordination cost. If teams anticipate higher social capital (e.g., trust accumulation, reputation enhancement) from collaboration, they are more inclined to proactively share data.

Social capital theory further explains how collaboration promotes data sharing through three dimensions: structural, relational, and cognitive. The structural dimension posits that cross-team collaboration, such as the formation of joint medical administrative teams, generates network connections that significantly expand the channels through which data can be shared. In the relational dimension, trust that is cultivated through long-term collaboration alleviates concerns regarding data misuse, thereby facilitating a more open and collaborative environment. Lastly, the cognitive dimension highlights that a shared goal, such as improving patient survival rates, encourages teams to perceive data sharing as a necessary action to achieve collective value. These dimensions collectively illustrate how collaboration can enhance data sharing through the establishment of robust networks, trust, and a shared vision.

The impact of resource scarcity on the willingness to share healthcare data in hospitals can be explained primarily through social exchange theory and motivation theory.

The effect of resource scarcity on data sharing can be interpreted using the cost-benefit framework of social exchange theory. When a team lacks certain data resources (e.g., rare disease cases), it may share other types of data (e.g., basic research data) in exchange for the needed resources, compensating for its deficiencies. In this case, the "benefit" of obtaining scarce resources outweighs the "cost" of sharing some data, increasing the willingness to

share. For example, a pediatrics team may share common disease data to obtain rare disease treatment experiences from other departments.

Motivation theory, particularly extrinsic motivation (e.g., reciprocity, resource exchange), further supports this mechanism. In resource-scarce situations, teams may view data sharing as a transaction strategy, leveraging shared data to gain external support (e.g., research collaboration opportunities) to meet their needs (Le et al., 2022). However, if a team perceives a potential "exploitation risk"—where other teams only take without reciprocating—concerns about resource depletion may suppress sharing behavior. Therefore, clear reciprocity rules (e.g., matching contribution levels) are crucial for maintaining a willingness to share.

2.3.3.2 Leadership factors affecting data sharing intention

The impact of leadership responsibility on the willingness to share healthcare data in hospitals can be explained through individual motivation theory and social exchange theory.

Leaders with a strong sense of responsibility perceive data sharing as part of their professional duty (intrinsic motivation) and believe that sharing data enhances healthcare quality (e.g., reducing misdiagnosis). This intrinsic satisfaction (e.g., sense of achievement, mission fulfillment) drives them to proactively promote data sharing processes, such as requiring their teams to regularly upload case data to a shared platform.

The psychological reward mechanism in social exchange theory further reinforces this behavior. When leaders receive peer recognition (e.g., being invited to participate in multi-center studies) or positive patient feedback (e.g., improved treatment success rates) due to data sharing, their psychological rewards (e.g., reputation, respect) increase, creating a positive feedback loop (Park & Gabbard, 2018).

The influence of leadership positive personality on data sharing intention in hospitals can be explained using individual motivation theory and social influence theory.

Leaders with positive personality traits exhibit both intrinsic motivation (e.g., pursuing innovation) and extrinsic motivation (e.g., seeking career advancement). For example, they may promote data sharing due to personal interest in exploring new treatments while also anticipating external rewards (e.g., securing research funding). This motivation integration drives leaders to adopt proactive data sharing strategies (Zhao et al., 2016), such as establishing incentive mechanisms to encourage team members to contribute data.

Normative pressure in social influence theory also plays a role. Positive leaders tend to shape an "open-sharing" team culture, publicly recognizing contributors or setting sharing

goals, making members perceive sharing as the normative and expected behavior, thereby increasing overall intention (Shen et al., 2011).

The effect of inter-leadership relationships on willingness to share healthcare data can be explained through social capital theory and social exchange theory.

The quality of leadership relationships directly affects the trust dimension of social capital. If department heads maintain close relationships (e.g., frequent communication, joint decision-making), mutual trust is strengthened, reducing concerns about data misuse. For example, collaboration between cardiology and radiology directors in developing shared data interfaces ensures the secure exchange of imaging data.

The reciprocity principle in social exchange theory further explains leadership interactions. When one leader shares data and receives resource support (e.g., priority access to advanced equipment) in return, this reciprocal relationship reinforces future sharing behaviors (Liu & Zhang, 2020). Conversely, if a competitive relationship exists between leaders, a zero-sum mindset may suppress data flow.

The impact of leadership privacy awareness on willingness to share healthcare data can be explained through social exchange theory and planned behavior theory.

Leaders with high privacy awareness strictly evaluate the risks (e.g., patient data leaks) and benefits (e.g., research value) of data sharing. According to social exchange theory, if they believe existing measures (e.g., anonymization, access control) effectively mitigate risks ("cost is controllable"), they are more likely to support sharing; otherwise, they may restrict it.

Perceived behavioral control in planned behavior theory complements this mechanism. If leaders have confidence in data protection technologies (e.g., encryption systems), their perceived ability to manage risks increases, making them more willing to approve data sharing requests (Zhou et al., 2020).

2.3.3.3 Organizational factors affecting data sharing intention

The influence of hospital service culture on willingness to share healthcare data can be explained through social capital theory and social influence theory.

A patient-centered service culture promotes data sharing via the cognitive dimension of social capital (i.e., shared vision). For example, if a hospital institutionalizes a data sharing process (e.g., mandatory upload of medical records to a unified platform) under the core value of "enhancing patient experience through collaboration", team members perceive sharing as "natural and necessary".

Normative pressure in social influence theory further strengthens this mechanism. When hospital executives publicly advocate for data sharing and set examples (e.g., the hospital director shares internal data for multi-center studies), employees tend to comply with organizational norms, proactively following suit (Hong et al., 2021).

The impact of hospital data center completeness on data sharing intention can be explained using planned behavior theory and social exchange theory.

A well-developed data center improves team perceived ease of sharing. According to planned behavior theory, if the hospital provides user-friendly platforms (e.g., integrated electronic health records), clear guidelines, and technical support, teams are more likely to perceive sharing as "simple and feasible", increasing intention (Zhou et al., 2020).

From a resource exchange perspective in Social Exchange Theory, a comprehensive data center acts as a shared resource pool. When teams recognize that sharing data grants quick access to high-value information, their motivation shifts from passive compliance to active engagement (Liu & Zhang, 2020).

2.4 Research on healthcare data sharing in China

Research on healthcare data sharing encompasses macro-level investigations into the current state of health big data sharing and micro-level analyses of factors influencing medical data sharing practices. A critical review of current research advancements is conducted subsequently to identify theoretical and practical gaps.

This part focuses on the state of the art of "data sharing in Chinese health care institutions" including the legal and practical practice. Some data about the overall health care structure in China, and the team composition would pave the way for the empirical study that comes in the next chapter.

2.4.1 Healthcare data development in China

In China, the medical big data industry has entered a period of rapid development. The Chinese medical industry has accumulated a massive amount of health and medical data, including patient data, medical record information, medical insurance information, health logs, genetic inheritance, medical experiments, clinical data, in vitro diagnostic products and third-party testing data, health and medical data processor operation data, and scientific research data. By mining and analyzing health and medical big data, it can promote early

diagnosis of diseases, guide better rehabilitation and nursing, and have significant clinical and economic benefits.

In 2016, the State Council issued the Guiding Opinions on Promoting and Standardizing the Development of Health and Medical Big Data Applications, marking the formal inclusion of health and medical big data into national strategies and becoming an important strategic resource for the country. In 2018, the National Health Commission issued the "National Health and Medical Big Data Standards, Safety, and Service Management Measures (Trial)". Article 49 of the Basic Medical and Health Promotion Law of the People's Republic of China, promulgated in December 2019, emphasizes the need to promote the development of health and medical big data applications. Table 2.2 presents the development of Chinese healthcare data policies.

At present, the public mainly learns about the construction of the medical and health system through three channels: firstly, the website of the National and Local Health Commission to understand relevant policies, regulations, work dynamics, and information on medical institution inquiries. Secondly, the government and medical apps, such as iShenzhen, Jinan, Health Guiyang, Qingdao Mobile Health, to obtain medical and health related information and services. Thirdly, the local government data open platform, which focuses on providing raw, machine-readable, and large-scale data resources. It usually sets up medical and health-related topics and provides datasets in this field.

As an important field related to people's livelihood, the opening of relevant data in healthcare is crucial for safeguarding public rights and improving government data open platforms. In 2017, the National Health and Family Planning Commission deployed the organization. China Mobile and Inspur Group launched the joint establishment of China Health and Medical Big Data Co., Ltd., and through the construction of five major data regional centers located in Jiangsu, Guizhou, Fujian, Shandong and Anhui in the east, west, north and south of the country, to collect the data of the future Chinese population from birth to death in the whole life cycle. On the one hand to provide data support for scientific research, product research and development, and clinical development, on the other hand, to attract a number of medical institutions and scientific research institutions to settle in the health and medical industry oriented development, forming an agglomeration effect. Under the background of the big data era, fully leveraging the leading and supporting role of information technology to promote the transformation and upgrading of the traditional health and medical industry is an important measure with significant and far-reaching significance. This is also a beneficial attempt by various enterprises to integrate resources across borders

and actively expand new forms of medical and health services. It is an important project that uses information technology to improve the medical experience, to enhance prevention capabilities, to promote health equity and to benefit the people.

Table 2.2 Chinese healthcare data policies

No.	Date	Administration	Title	Content
1	2015-1	National Health Commission of the People's Republic of China	Notice on Issuing the Key Points of Health and Family Planning Work in 2015	Accelerate the construction of the three major databases of population information, electronic medical records, and resident electronic health records, and promote interconnectivity between systems, steadily advancing the application of health and medical big data
2	2015-7	State Council	Guiding Opinions on Actively Promoting Internet+ Action	Develop Internet based medical and health services, support third-party institutions to build a medical information sharing service platform, and strengthen the integration of regional medical and health service resources
3	2015-9	State Council General Office	Action Plan for Promoting the Development of Big Data	Build electronic medical records and electronic health record databases, establish a medical and health management and service big data application system, promote the market-oriented service of big data applications, and optimize resource allocation
4	2016-6	State Council General Office	Guiding Opinions on Promoting and Standardizing the Development of Healthcare Big Data Applications	Accelerate the construction of a unified, authoritative, and interconnected population health information platform, promote the sharing and opening of health and medical big data resources, and comprehensively deepen the application of health and medical big data
5	2016-10	State Council General Office	Healthy China 2030 Plan Outline	Promote the open sharing, deep mining, and widespread application of medical and health big data based on regional population health information platforms, and strengthen the construction of regulations and standard systems related to health and medical big data
6	2017-1	National Health Commission of the People's Republic of China	Notice on Printing and Distributing the 13th Five Year Plan for National Population Health Informatization Development	Propose the main tasks of consolidating the foundation, deepening the application, and developing innovation of population health informatization and health medical big data
7	2018-4	National Health Commission of the People's Republic of China	Regarding the Issuance of National Hospital Informatization Construction	Encourage medical and health institutions to integrate information technologies such as cloud computing, big data, and artificial intelligence with public health applications based on their own situations, and explore

No.	Date	Administration	Title	Content
			Standards and Norms	innovative development models
8	2018-4	State Council General Office	Opinions on Promoting the Development of "Internet plus+Medical Health"	Accelerate the exchange and sharing of medical and health information, improve the standard system of "Internet plus medical and health", and formulate laws and regulations on the confirmation, opening, circulation, transaction and property rights protection of health care big data
9	2018-9	National Health Commission of the People's Republic of China	Notice on Issuing the National Health and Medical Big Data Standards, Safety and Service Management Measures	Strengthen the standard management, safety management, and service management of health and medical big data, promote the application of health and medical big data for the benefit of the people, and promote the development of the health and medical big data industry
10	2020-10	National Health Commission of the People's Republic of China	Opinions on Strengthening the Standardization System of National Health Information Construction	Coordinate planning, organize the formulation of health and medical big data standards, establish a directory system for health and medical big data resources, accelerate the formulation and implementation of standards for key areas such as health and medical data collection, data openness, data trading, and promote the open application of health and medical big data classification, grading
11	2021-5	State Council General Office	Opinions on Promoting High Quality Development of Public Hospitals	Promote the deep integration of new generation information technologies such as cloud computing, big data, Internet of Things, blockchain, and (5G) with medical services
12	2022-5	State Council General Office	Regarding the Issuance of the 14th Five Year Plan for National Health Notice of Planning	Explore the establishment of information sharing mechanisms among health, medical security, drug supervision and other departments, and achieve cross regional and cross departmental data sharing through a national integrated government service platform

2.4.2 Healthcare data sharing in China

The sharing of health and medical data is considered an important part of the construction of health and medical informationization. The development level of internal data sharing in medical institutions directly affects the development process of the entire health and medical big data application system construction.

In 2018, the National Health Commission issued the “Management Measures for the Grading Evaluation of the Application Level of Electronic Medical Record Systems (Trial)”

and the "Grading Evaluation Standards for the Application Level of Electronic Medical Record Systems (Trial)", requiring second level and above hospitals to participate in the grading evaluation of the functional application level of electronic medical record systems on time. In 2020, all third level hospitals must achieve a grading evaluation level of 4 or above, and second level hospitals must achieve a grading evaluation level of 3 or above. The implementation of this management method and evaluation criteria has further promoted the development of internal data sharing in medical institutions nationwide.

Through a tiered evaluation system, medical institutions are able to better assess the functional application level of their electronic medical record systems and make improvements and enhancements accordingly. This policy not only promotes the integration and sharing of data within medical institutions, but also lays the foundation for cross-institutional data sharing.

In recent years, China has made significant progress in the sharing of medical data. By the end of 2021, more than 80% of tertiary hospitals in 30 provinces across the country had implemented the acceptance and application of electronic health cards (codes), with a population coverage rate of nearly 70%. In addition, 100% of the provinces had established regional population health information platforms. The establishment of these platforms has enabled a certain degree of sharing of medical data within the regions, thereby improving the efficiency and quality of medical services.

a) Construction of the National Healthcare Data Platform

With the continuous promotion of medical data sharing across the country, the government has issued a series of specific policy documents. In 2020, the "Scale Maturity Evaluation Plan for Regional National Health Information Interconnection" and the "Scale Maturity Evaluation Plan for Hospital Information Interconnection" were released. Notice on Issuing the Management Measures for Mutual Recognition of Inspection and Testing Results of Medical Institutions in 2022. In 2023, the "Opinions on Further Deepening Reform and Promoting the Healthy Development of Rural Medical and Health System" were released, which pointed out that "we will improve the standardization system of regional national health information, promote the interconnection and sharing of population information, electronic medical records, electronic health records, and public health information, and by 2025, we will coordinate the construction of a comprehensive county-level health information platform". The above policy documents have put forward higher-level requirements for the development of internal data sharing in Chinese medical institutions.

In recent years, China has been promoting the construction of a national healthcare data platform on one hand, and gradually advancing the construction of standards and technical systems for medical and health data interconnection on the other hand.

In terms of data platform construction, the construction of China's national health information platform has also been preliminary completed, and the development of health and medical data sharing has good basic conditions. The full coverage of national, provincial, municipal, and county platforms has been basically achieved. There is an inclusion relationship between the data sets of provincial platforms and municipal platforms. For example, the data set of "List of Designated Hospitals for Medical Treatment of Pneumonia Infected by novel Covid-19 in Shandong Province" of Shandong Public Data Open Network includes the data set of "Designated Medical Institutions for Admission of Pneumonia Infected by novel Covid-19 in Jinan City" of Jinan Public Data Open Network.

In terms of interconnection construction, China has systematically created and promoted the application of medical and health information interconnection standards and technology systems with independent intellectual property rights nationwide. This measure has opened up a new situation in China's medical and health information construction, led the leapfrog development of medical and health information interconnection level, and effectively supported the improvement of medical and health service level, service capacity, and service mode innovation. In terms of the interconnection standard system, a national medical and health data interconnection standard system has been developed, including interconnection data standards, technical standards, and management standards. In terms of interconnection and intercommunication technology paths, a regional health data platform centered on residents' health records and a hospital data platform centered on electronic medical records have been proposed as the hub of interconnection and intercommunication technology architecture. The interconnection and intercommunication service technology content has been designed to support the interconnection and information sharing of medical and health data.

b) Governance coordination mechanism

Improving the overall health level of the population has always been a key goal of China's social development, and promoting the development of hierarchical diagnosis and treatment and accelerating the construction of medical consortia are important ways to achieve a healthy China. The "14th Five Year Plan for National Healthcare Security" issued in 2021 provides further instructions on optimizing the collaborative governance system of healthcare security.

Research suggests that vigorously promoting the modernization of medical security governance, establishing a governance coordination mechanism, and improving and perfecting the medical security governance coordination mechanism from three levels: national institutions, government departments, and medical insurance associations can enhance China's medical security governance capacity. Li P et al. (2021) analyzed from the perspectives of policy makers, medical service providers, and customers, improved the hierarchical diagnosis and treatment system of medical services, further united all parties, and promoted the coordinated development of hierarchical diagnosis and treatment institutions.

c) Hospital development and data sharing

As a special place, hospitals not only have medical functions, but also many social functions, such as financial auditing, data sharing, performance management, economic operation. Therefore, for hospitals, collaborative management with various industries and departments is beneficial for promoting hospital data sharing.

Based on the theory of collaboration, Li J (2021) analyzes the reasons that hinder government data sharing, and then proposes some specific methods to break down data barriers on the basis of existing work structures, such as improving collaboration mechanisms, establishing incentive systems, improving technological levels, and cultivating a culture of trust, in order to make government data sharing smoother. Xiong (2023) analyzed the practical difficulties of regional government data sharing and collaborative legislation, explored the formal and content elements of constructing a government data sharing and collaborative legislation system, and provided important references for promoting the development of regional collaborative integration strategic system. Li (2023) constructed an archive data sharing mechanism consisting of three mechanisms: subject coordination, policy collaboration, and platform linkage, by analyzing the favorable factors that affect archive data sharing. He also proposed strategies to optimize resource allocation, implement subject collaboration, and ensure data security, further expanding the depth and breadth of archive data sharing services.

2.4.3 Research on healthcare data sharing in China

At present, Chinese research has gradually recognized the strategic position of promoting the development of medical data sharing in the field of healthcare. By analyzing the current difficulties and challenges in medical data sharing, corresponding countermeasures and suggestions have been proposed, and the future development trend of medical data sharing has been forecasted. But most of these studies analyze from a macro perspective and do not

focus on a specific field. Most studies believe that medical data sharing in China is still in its infancy. Among them, key issues such as difficulty in ensuring privacy and security, unclear data ownership, and unclear distribution of benefits have become obstacles to the development of medical data sharing. Data silos, data security, talent shortage, data heterogeneity, and privacy breaches are key issues hindering the development of medical data sharing.

The current research on health and medical data mainly focuses on analyzing the sensitivity of health and medical data. Explain the security risks of health and medical data; Explore effective risk prevention and control measures. Thus achieving open utilization and value release of data.

In recent years, research on health and healthcare data sharing has gradually increased, focusing on healthcare data sharing platforms and mechanisms, the basic principles and impacts of healthcare data sharing, and the willingness and influencing factors for sharing healthcare data.

a) Research on healthcare data sharing platforms

The composition and improvement of data sharing platforms are key areas in healthcare data sharing research (He et al., 2016). Currently, healthcare data sharing activities in China mainly rely on "platforms," aiming to build national, provincial, and local healthcare data platforms to promote the interconnection and sharing of healthcare data (Zhang et al., 2020). Researchers have also studied strategies, application technologies, implementation standards, and legal supervision related to healthcare data sharing, trying to solve key issues such as privacy protection and inter-connectivity (Guo & Wang, 2019; Zhao et al., 2019).

b) Research on healthcare data sharing mechanisms

Healthcare data sharing mechanisms are an important research direction in the healthcare sector. By constructing regional healthcare data sharing platforms, not only can resources be optimized and the quality of healthcare services improved, but privacy protection for healthcare data can also be achieved, addressing problems such as "information silos" in medical resources. However, this process faces many challenges, including data security, privacy protection, unclear data ownership, and unclear benefit distribution. Additionally, research on the legal and ethical frameworks for healthcare data sharing, as well as healthcare data sharing models based on autonomous consent, has gradually gained attention from academia and industry. Guo et al. (2022) analyzed the factors that affect residents' willingness to participate in health and medical data sharing, and proposed suggestions such as enacting relevant laws and regulations to refine data protection mechanisms, developing privacy and

security information technology to ensure data security, and doing a good job in publicity and popularization to establish confidence in data sharing.

Zhou et al. (2021) believes that the healthcare industry often needs to share data, but the process of sharing may lead to the leakage of real data. In order to protect the privacy of patients, it is necessary to establish scientifically reasonable data exchange standards and improve the ability to desensitize sensitive data, thereby further ensuring data security. Chen (2023) analyzed the threats and reasons faced by personal data in health and medical data sharing, and believed that China needs to further improve the legal system and supervision mechanism related to health and medical data sharing. By regulating the behavior of different stakeholders in handling health and medical data during the sharing process, individuals can further safeguard their control and self-determination over personal data in healthcare data sharing.

c) Healthcare data share intention

The healthcare data share intention is a hot topic in the healthcare sector, involving patient privacy, data security, and policy regulations. Research on the willingness to share healthcare data helps understand the factors influencing patients' intention to share their data, providing a basis for developing related policies and measures.

d) Privacy protection for healthcare data

Privacy protection is a core issue in healthcare data sharing. How to ensure privacy protection while achieving effective data sharing has become a common topic among researchers. Privacy protection is essential for promoting healthcare data sharing, as only under privacy protection can healthcare data truly be shared and utilized.

At the macro level, international research and practices on health and healthcare data sharing have made significant progress, particularly in the institutionalization and standardization of data openness and sharing. The U.S. and the EU have made positive explorations in data sharing policies, providing important reference models for global data sharing. In the U.S., policies such as the "Data sharing Policy" have promoted the widespread application of data sharing in fields like scientific research, clinical services, and public health. The EU has established the "Single Data Space" through legislation like the "Data Governance Act", advancing the circulation and sharing of data elements. However, international research also faces some challenges. Despite the continuous improvement of policy frameworks for data sharing, issues such as data privacy protection and data security remain key concerns. For example, both the U.S. and the EU have experienced large-scale

healthcare data breaches, highlighting the importance of privacy protection during data sharing.

In China, research and practice on health and healthcare data sharing started late but has made remarkable progress in recent years. The country has promoted the infrastructure construction for health and healthcare data sharing at the policy level, initially established healthcare databases, and achieved results in integrating information technology with medical research and health management. However, there are still challenges in domestic health and healthcare data sharing. Firstly, laws and regulations on data sharing are still incomplete, with issues such as data ownership, privacy protection, and data security needing urgent attention. Secondly, technological support for data sharing needs to be strengthened, as data silos still exist, and the interoperability and interconnection of data remain insufficient. Furthermore, the benefit distribution mechanism for data sharing is unclear, leading to low enthusiasm among data providers.

Domestic research, such as, He et al. (2016) has made certain achievements in healthcare data sharing platforms, sharing mechanisms, and data sharing intention. For example, some studies have proposed big data-based medical file data sharing systems, emphasizing the advantages of big data technology in improving medical service efficiency and reducing disease transmission risks. Additionally, research has explored the influencing factors of healthcare data sharing intention and provided recommendations such as improving data protection systems, developing privacy-preserving computing technologies, and enhancing publicity and education. However, domestic research still requires further development in theory and practice. In the future, domestic research needs to focus on collaborative innovation in policy, technology, and management to promote the healthy development of health and healthcare data sharing. Dai and Meng (2017) pointed out that health and medical data in China are usually only for internal use, and face issues such as how to open and share data, how to control the degree of openness, and how to ensure patient privacy.

e) Data sharing between medical administrative teams

Through literature review, it was found that in recent years, research on cross department data sharing within medical institutions in China has mostly focused on a single aspect, such as research on the interconnection and interoperability of electronic medical records within the hospital, as well as research on how to achieve data sharing at the technical level. However, there are not many studies on data sharing within the entire medical institution from a fusion perspective. However, in the field of government data sharing, research on cross department data sharing is relatively diverse. This is partly due to factors such as a large

number of government departments, redundant data, and diverse audiences; On the other hand, it is because the government is vigorously promoting convenient services, and promoting cross department data sharing is an essential part. By referring to research on data sharing between government departments, especially on the obstacles faced, solutions, collaborative factors, and development directions, it has important reference value for promoting the development of internal data sharing in medical institutions.

Weng and Li (2016) pointed out that compared to foreign countries, China's government data sharing mainly faces obstacles such as incomplete top-level design, lagging supporting laws and regulations, obvious division between departments, barriers to data sharing, supply-demand imbalance in the sharing process, and infringement of citizens' privacy rights. They also proposed the establishment of basic principles such as comprehensive openness, collaborative sharing, equal treatment, intellectual property protection, and privacy protection. Zhang and Zhao (2020) proposed a multi-level data sharing analysis framework based on "system business system" by combining cross-departmental collaboration theory with blockchain technology to explore cross-departmental data sharing models for government services.

The current data sharing should not only be reflected in data exchange, but also emphasized in data application. At present, there are obstacles in the data sharing work of government departments, such as intensified departmental protectionism, data silos, high data sharing costs, difficulties in defining data responsibilities and ownership, inability to guarantee data quality and security, and imperfect sharing mechanisms. In order to further standardize and institutionalize departmental data sharing work, it is necessary to comprehensively enhance the data sharing capabilities of government departments from four aspects: organizational guarantee, institutional guarantee, talent guarantee, and supervision guarantee. Li and Huang (2019) took the government departments of H city as the research object, through in-depth analysis of the reasons for the mismatch between data demand and data sharing, identified four factors among government departments: organizational structure, institutional environment, individual behavior and interaction, and data technology, which are the main factors affecting data sharing among government departments.

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Chapter 3: Research Model and Hypotheses

Building on the theoretical foundations established earlier, this chapter delineates the determinants of inter-team data sharing intentions. To investigate the relationship between sharing intentions and behaviors, along with the moderating effects of organizational factors, we construct a research model and propose corresponding hypotheses.

3.1 Research model

Based on the influencing factors of healthcare data sharing and the theoretical mechanisms affecting data sharing intention, this study proposes a multi-level theoretical model for data sharing mechanisms among medical administrative teams. The model focuses on the following key questions:

1. Do multidimensional factors (such as organizational, team, and individual factors) affect the sharing of healthcare data among hospital teams?

2. Do organizational factors at the departmental level (such as hospital service culture and the completeness of hospital data centers) influence data sharing between teams?

3. In the context of inter-team healthcare data sharing within hospitals, does the data sharing intention promote sharing behavior?

Grounded in social exchange theory, social capital theory, and planned behavior theory, this study introduces a three-tiered “Organization-Team-Leadership” integrated model (Figure 3.1) to explore how multi-level factors impact the willingness to share healthcare data among teams.

Organizational-level factors include hospital service culture and completeness of hospital data centers. Team-level factors include inter-team collaboration and team resource scarcity. Leadership-level factors include leaders’ sense of responsibility and positive personality traits, as well as relationships among leaders and their awareness of privacy protection.

This model incorporates service culture and data center completeness as moderating variables, explaining how the organizational environment strengthens or weakens the impact of core factors on data sharing intention. Additionally, the study examines the relationship between data sharing intention and actual sharing behavior.

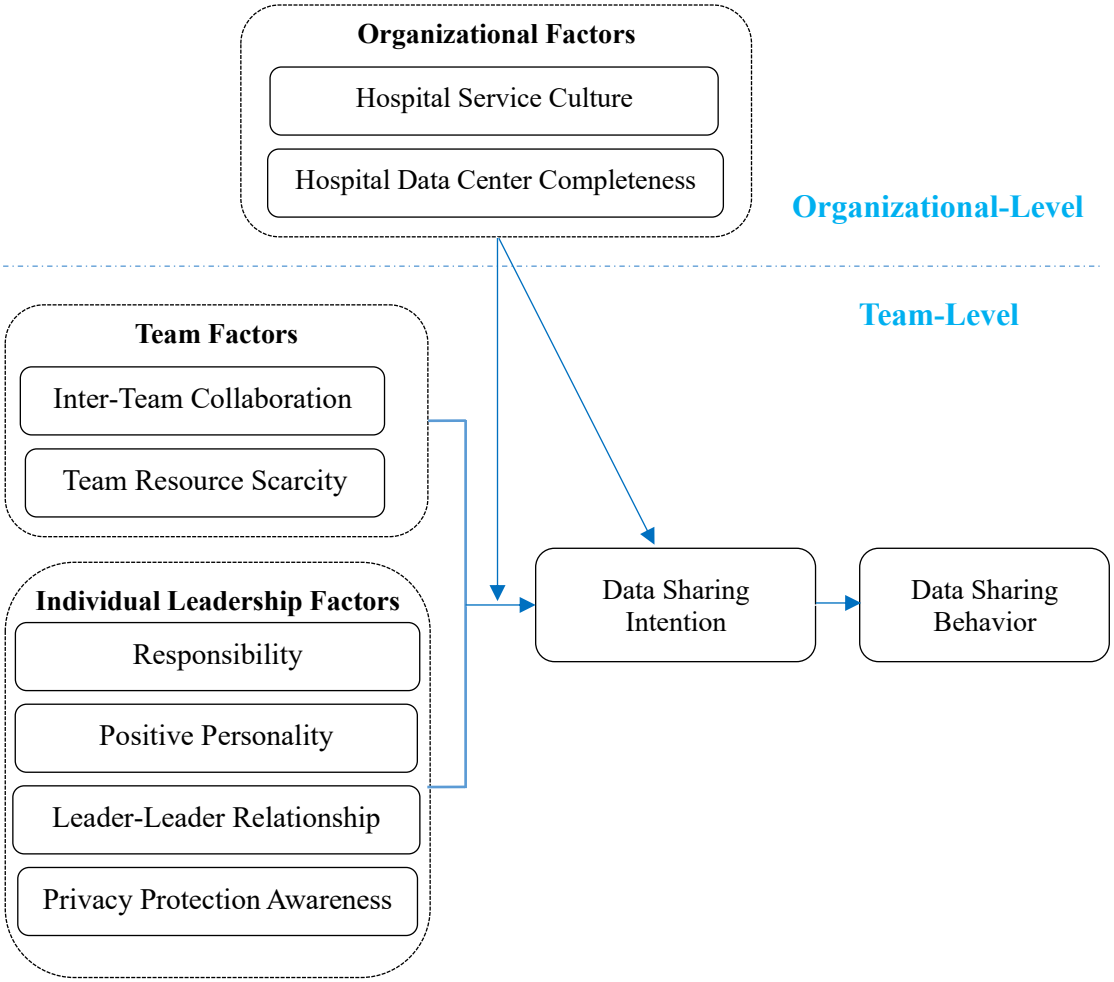


Figure 3.1 Research framework

3.2 Theories and hypotheses

Based on the "organization-team-leadership" multi-level integrated model, this study proposes the following research hypotheses.

3.2.1 Factors influencing data sharing intention of medical administrative team

The study proposes three sets of hypotheses addressing the impacts of team factors, leadership factors, and organizational factors on data sharing intention (Figure 3.2).

Team Factors

Team collaboration is increasingly valued in modern organizations as it integrates diverse expertise, skills, and experiences, thereby enhancing overall efficiency and innovation. Through collaboration, team members can collectively solve problems and achieve shared goals, creating a synergy that drives data sharing. Inter-team collaboration involves the interconnection of ideas, actions, and emotions among different teams. Like intra-team

dynamics, collaboration fosters trust and support, making teams more willing to share data and resources.

Collaboration among teams helps establish an organizational structure that promotes sharing. Mao et al. (2015) viewed data sharing as a collective effort in which individual organizational entities play a secondary role. When connections between groups are more frequent and formal, they create structures that support project coordination and resource sharing. Greater team collaboration implies more interactions and mutual support among teams. Yeon et al. (2016) found that perceived support is positively associated with sharing behavior.

When teams share emotions and information over time, a sense of community develops. This is defined as a sense of belonging among members, a feeling that they matter to each other and to the group, and a shared belief that their needs will be met through their collective commitment (Yilmaz, 2016). A sense of community encourages members to identify with a data center and influences their intension to share knowledge with other members within the same network.

When inter-team collaboration is strong, members develop a heightened "sense of membership". Research suggests that members with a strong sense of membership are more likely to form close relationships with their data sharing communities, which encourages them to participate more actively in sharing activities (Erden et al., 2012).

Hypothesis 1a: Inter-team collaboration has a positive influence on data sharing intention.

Resource scarcity refers to the relative insufficiency or limitation of essential resources needed to complete tasks or projects. In the context of data sharing, this particularly refers to the data possessed by one team being scarce and limited for another team.

Data sharing promotes scientific progress by enhancing research quality assurance, improving peer review processes, and fostering greater engagement among researchers (Razmerita et al., 2016). Hospitals often require comprehensive data for more precise diagnoses, and complete datasets are foundational for medical research. Therefore, from the perspective of hospital-wide research, the rarer the data held by different departments, the higher the demand. As a result, resource scarcity incentivizes closer collaboration among teams, including a stronger willingness to share data.

Hypothesis 1b: Resource scarcity has a positive influence on data sharing intention.

Individual Leadership Factors

At the individual level, research often explores the relationship between motivation and behavior based on social exchange theory. According to this theory, individuals in a social

environment expect knowledge sharing to yield benefits such as future support, social recognition, a professional environment, or personal satisfaction. In other cases, individuals may feel an intrinsic obligation to help others or derive personal enjoyment from sharing knowledge to advance scientific progress. Therefore, both extrinsic and intrinsic motivations can explain sharing behaviors. Extrinsic motivation refers to engaging in activities driven by goal-oriented reasons, such as external rewards or benefits. In contrast, intrinsic motivation stems from personal satisfaction and enjoyment rather than external pressure.

Personality traits are linked to important organizational outcomes, including job performance, training success, teamwork, sales, turnover, self-assessed performance, promotability, salary, career development, and leadership effectiveness. Among the personality traits research, the Big Five personality model is widely applied in organizational research and has yielded compelling evidence. Conscientiousness, which is characterized by reliability, diligence, achievement orientation, and organization, has been found to be positively associated with knowledge sharing.

Hypothesis 2a: Team leader's responsibility has a positive influence on data sharing intention.

The positive personality of team leaders, especially the prosocial value orientation (Grant & Rothbard, 2013), refers to the tendency of an individual to take proactive and positive actions to influence and change the environment when facing situations and tasks. Leaders with a positive personality can set clear goals and encourage team members to actively participate in data sharing through incentive mechanisms. When facing challenges and uncertainties in the process of data sharing, leaders with a positive personality can adopt a positive attitude and take measures. They are not only able to identify potential problems and risks but also actively seek solutions to ensure the smooth progress of data sharing. This positive attitude can enhance the confidence of team members, making them more willing to participate in data sharing.

In addition, prosocial orientation also manifests in altruism. Altruism is expressed through voluntarily helping others and experiencing intrinsic happiness from doing so. It is defined as a voluntary action that enhances others' well-being without expecting a return (Fang & Chiu, 2010). Knowledge sharing that benefits others can bring internal joy and fulfillment to altruistic individuals.

Members with high levels of altruism are more willing to contribute their knowledge to others. Moreover, they are more likely to seek knowledge from others due to the satisfaction they gain from data sharing. Persson and Kajonius (2016) suggest that altruism fosters the

necessary conditions for knowledge sharing by reducing conflicts and promoting participation. Fang and Chiu (2010) found that members' altruism has a positive impact on their intention to continue sharing knowledge.

Hypothesis 2b: Team leader's positive personality has a positive influence on data sharing intention.

Chen et al. (2012) argue that collaboration between departments facilitates better knowledge sharing. Inter-team collaboration is reflected in the structure and development of organizational relationships, particularly in the exchange of resources and knowledge within an organization (Tang et al., 2016). When team leaders maintain harmonious relationships, inter-team relations improve as well. Close organizational relationships help establish high levels of data sharing.

According to social exchange theory, when inter-team leaders have strong relationships, they believe that knowledge sharing can further enhance their bonds. This sharing occurs based on principles of fairness and reciprocity, fostering a positive attitude toward knowledge sharing. Developing and maintaining meaningful relationships, as well as the potential for future reciprocal relationships, are key extrinsic motivations for sharing (Bock et al., 2005). Many studies indicate that reciprocity significantly influences knowledge-sharing behaviors in the research community (Park & Gabbard, 2018). When organizations consider internal sharing, collaboration expands the knowledge base of all parties and enhances organizational competitiveness.

Notably, in the Chinese context, individuals are influenced by "face" (reputation). Cross-cultural researchers argue that cultural factors such as collectivism and face consciousness in Confucian societies may directly influence behavioral intentions. To maintain relationships, team leaders actively respond to each other's data sharing needs.

Hypothesis 2c: Leader-leader relationship has a positive influence on data sharing intention.

Team leaders with strong privacy awareness may initially be reluctant to share data due to concerns about data breaches or misuse. However, when faced with actual data sharing situations, they are more likely to understand how to legally and compliantly share data, ultimately leading to better performance in inter-team data sharing.

Privacy awareness among leaders is a significant advantage, reflecting their competency and earning others' recognition. According to Park and Gabbard (2018), individuals who establish professional identities and reputations within a relevant community are more likely to share data. Research suggests that when directly requested by peers, scientists generally do

not mind sharing data because such interactions implicitly assure the recipient's recognition of the data provider's contributions and that the data will not be misused (Yilmaz, 2016). This implies that when data sharing is approached with the correct mindset, implicit guarantees reduce concerns, making data owners more willing to share.

Hypothesis 2d: Team leader's privacy protect awareness has a positive influence on data sharing intention.

Organizational Factors

Research generally recognizes organizational culture as a key driver of data sharing. Organizational service culture refers to the values, beliefs, and behavioral norms that an organization forms during its long-term service process, which has a profound impact on employees' behavior and attitudes. The service culture emphasizes patient-centeredness, and this value orientation can enhance trust among team members. When team members believe that each other will act in the best interest of the patients, they are more willing to share data. Moreover, the service culture encourages openness and collaboration, and this cultural atmosphere can foster data sharing among teams. When team members feel the organization's support for open collaboration, they are more inclined to share data to achieve common goals. The service culture of hospitals emphasizes patient satisfaction and aims to provide high-quality healthcare services. This goal encourages team members to recognize the importance of data and be willing to use it as a foundation for decision-making and actions, thereby enhancing their willingness to share data.

Team members perceive data sharing to achieve common goals. When teamwork and shared objectives are emphasized, members are more inclined to support each other and solve problems collaboratively. In this cultural setting, data sharing is regarded as a crucial tool to foster teamwork and improve efficiency.

Hypothesis 3a: Organizational service culture has a positive influence on data sharing intention.

The completeness of a hospital data center refers to the capability and level of a hospital in data storage, processing, management, and sharing. A complete data center is not only capable of efficiently storing and managing large amounts of data but also supports rapid data processing and secure data sharing.

In knowledge-sharing studies, tools and systems such as knowledge management systems are essential to support sharing. Employees' perception of the accessibility of knowledge management systems is positively correlated with knowledge-sharing behavior. Accessibility reflects the completeness of hospital data centers. Oeldorf-Hirsch et al. (2019) identified

technological barriers as a major obstacle to healthcare data sharing, including deficiencies in data collection, storage, retrieval, language barriers, data format constraints, lack of data transformation, coding and integration support, and absence of metadata standards. The completeness of hospital data centers is closely related to overcoming these technical barriers —the more complete the data center, the fewer obstacles to data sharing.

In addition to convenience, a complete data center usually has perfect data security and privacy protection measures, which can effectively protect the security and privacy of data. Team members are more willing to share their own data when they trust the data sharing environment.

Hypothesis 3b: The hospital data center completeness has a positive influence on data sharing intention.

3.2.2 Intention and behavior of data sharing between teams

The Theory of Planned Behavior (TPB) is a framework for predicting and explaining individual behaviors. TPB evolved from the Theory of Reasoned Action (TRA), which posits that behavioral intention is the direct determinant of behavior, influenced by attitudes and subjective norms. TPB builds on TRA by adding perceived behavioral control, enhancing its explanatory power and applicability.

TPB consists of five constructs: attitude toward behavior, subjective norms, perceived behavioral control, behavioral intention, and actual behavior. These collectively represent an individual's actual control over behavior. TPB has been widely applied in predicting and explaining health-related behaviors such as smoking, alcohol consumption, and physical activity (Wu & Kuang, 2021). TPB suggests that individual intention to engage in a behavior depends on their attitude toward it, their perception of social expectations, and their belief in their ability to control the behavior. Both intention and perceived behavioral control influence actual behavior.

Based on the TPB model, behavioral intention is the most direct determinant of behavior. The three key variables in TPB can directly or indirectly affect people’s behavioral intentions and actions. Research on knowledge sharing provides substantial evidence of the relationship between sharing intention and actual sharing behavior.

Hypothesis 4: The data sharing intention has a positive influence on data sharing behavior.

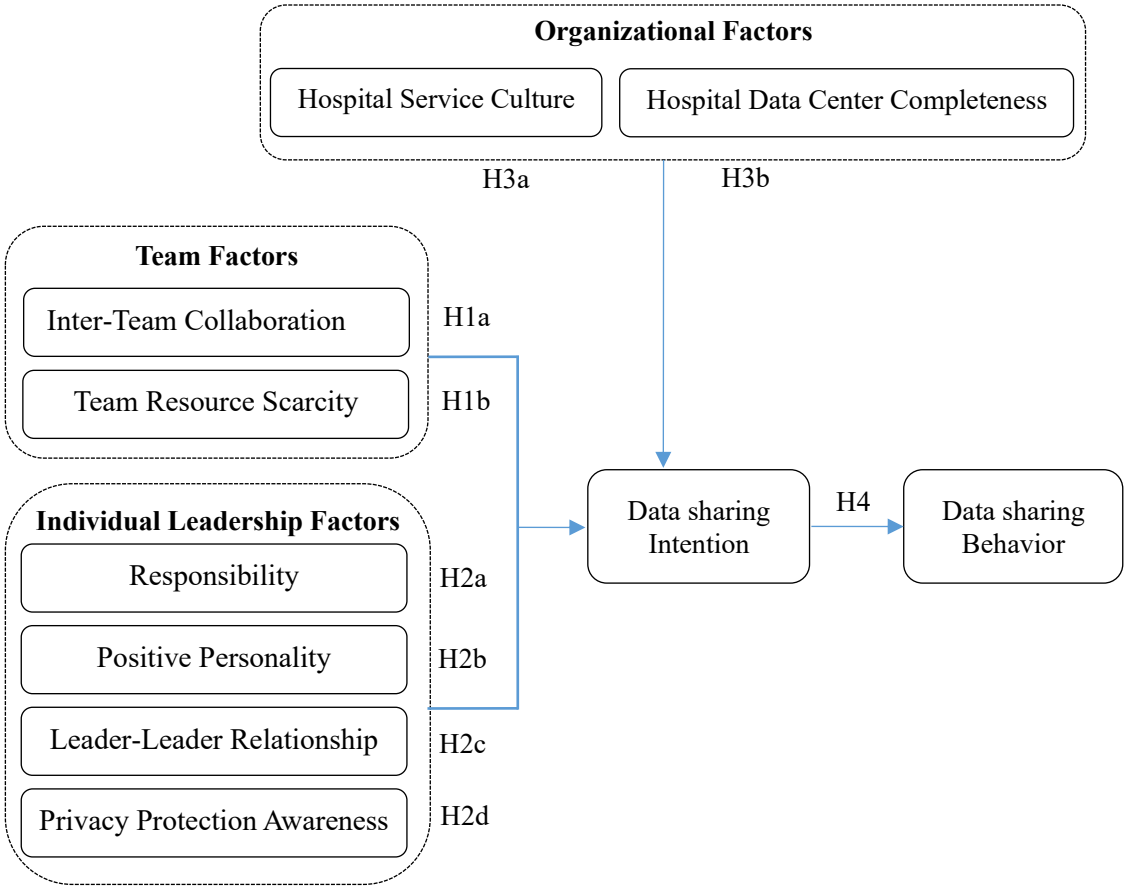


Figure 3.2 Hypotheses for factors affecting data sharing intention and behavior

3.2.3 Moderating role of organizational factors

Moderating role of organizational factors include service culture and hospital data center completeness (see Figure 3.3).

Moderating role of service culture

Organizational culture represents the workplace environment and provides intrinsic value to organizational structures and processes through shared values and behaviors. Members working in such an environment perceive the cultural atmosphere and believe it influences their motivation and behavior. When the organizational climate supports sharing norms, knowledge-sharing behavior is encouraged (Chen et al., 2012).

The service culture emphasizes patient-centeredness, and this value orientation can enhance trust among team members. When team members believe that each other will act in the best interest of the patients, they are more willing to share data.

The service culture shapes the subjective norms of team members, thereby influencing their intention to share data. Subjective norms refer to the social expectations that an individual perceives when engaging in a particular behavior. Under the influence of the

service culture, team members feel pressure from their colleagues and superiors, perceiving data sharing as a necessary action, which in turn increases their intention to share data. The service culture encourages openness and collaboration, and this cultural atmosphere can foster data sharing among teams. When team members feel the organization's support for open collaboration, they are more inclined to share data to achieve common goals.

Moreover, service culture promotes employees' proactive assistance to service recipients, reflecting personal benevolence and kindness. As a shared value within organizations, team members believe their colleagues will exhibit more supportive and helpful behaviors under the influence of service culture. Fang and Chiu (2010) found that individuals' trust in their colleagues' expertise, integrity, and benevolence increases their willingness to help, which in turn influences their level of knowledge contribution.

Hypothesis 5a: Hospital service culture moderates the relationship between inter-team collaboration and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Hypothesis 5b: Hospital service culture moderates the relationship between resource scarcity and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Hypothesis 6a: Hospital Service culture moderates the relationship between team leader's responsibility and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Hypothesis 6b: Hospital Service culture moderates the relationship between team leader's positive personality and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Hypothesis 6c: Hospital Service culture moderates the relationship between leader-leader relationship and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Hypothesis 6d: Hospital Service culture moderates the relationship between team leader's privacy protect awareness and data sharing intention, such that when service culture is stronger, the relationship is stronger.

Moderating role of hospital data center completeness

The completeness of a hospital data center refers to the capability and level of a hospital in data storage, processing, management, and sharing. A complete data center is not only capable of efficiently storing and managing large amounts of data but also supports rapid data processing and secure data sharing. Data centers with high completeness usually can provide

efficient data-sharing platforms, enabling team members to more conveniently access and use the data they need. By establishing clear data-sharing policies and regulations, a complete data center encourages team members to actively participate in data sharing.

Many studies on healthcare data sharing platforms suggest that online platforms facilitate data sharing (Zhang et al., 2017). Sinapuelas and Ho (2019) highlighted that the availability of technological infrastructure is a crucial factor influencing researchers' intention and ability to share data.

A well-developed hospital data center ensures unified data storage, management, and access, simplifying the data sharing process and making inter-team collaboration more efficient and seamless. Additionally, a comprehensive data center often incorporates stronger data security and privacy protection measures, increasing team members' confidence in data security and thus their willingness to share.

From the perspective of data providers, hospital data center completeness represents the institution's support and inclination toward data sharing. As discussed earlier, when hospitals encourage data sharing and provide necessary support and security, team members are more inclined to share data.

Therefore, in the context of higher completeness of data centers, the sharing of medical data is more active. Data centers with higher completeness can effectively enhance the willingness of team members to share data by improving the convenience of data sharing, strengthening the trust in data sharing, promoting the cultural construction of data sharing, and supporting the technical capabilities of data sharing.

Hypothesis 7a: Hospital data center completeness moderates the relationship between inter-team collaboration and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

Hypothesis 7b: Hospital data center completeness moderates the relationship between resource scarcity and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

Hypothesis 8a: Hospital data center completeness moderates the relationship between team leader's responsibility and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

Hypothesis 8b: Hospital data center completeness moderates the relationship between team leader's positive personality and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

Hypothesis 8c: Hospital data center completeness moderates the relationship between leader-leader relationship and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

Hypothesis 8d: Hospital data center completeness moderates the relationship between team leader's privacy protect awareness and data sharing intention, such that when data center completeness is higher, the relationship is stronger.

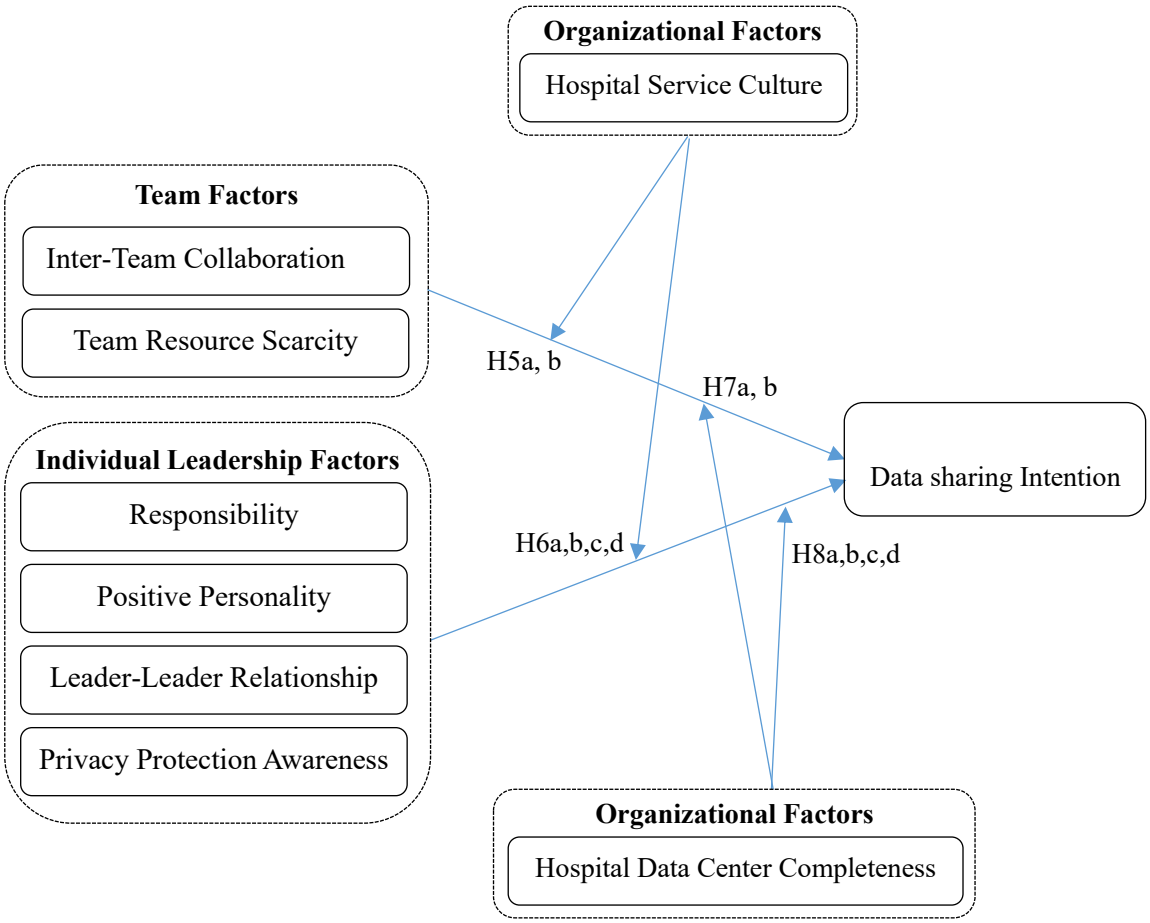


Figure 3.3 Hypotheses for moderating effect

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Chapter 4: Analysis and Results

This chapter tests the proposed hypotheses and evaluates the research model through empirical analysis. We outline the research method employed, including research design and data collection procedures, to ensure methodological rigor and reliability. Subsequently, we detail the criteria and processes for sample selection, along with measurement methods for variables across different levels, to guarantee data accuracy and representativeness. Data analysis techniques are then applied to process and analyze the collected data, testing the validity of the hypotheses. Finally, the hypothesis testing results are comprehensively reported.

4.1 Research method

This study adopts the questionnaire survey method. In social science research, the questionnaire survey is a commonly used and important data collection tool. Compared to other research methods, such as in-depth interviews or field observations, the questionnaire survey requires fewer resources in terms of design, implementation, and data processing, and has a relatively low cost. It is particularly suitable for use with large-scale samples, as it allows for the collection of a large amount of data from respondents in a short time. This efficiency is especially enhanced when using electronic questionnaires, which can be quickly distributed and collected, significantly improving data collection efficiency. The questionnaire survey employs well-established scales, ensuring that all respondents face the same questions and response methods, which enhances the comparability and consistency of the collected data. Generally, questionnaire surveys are conducted anonymously, which helps to alleviate respondents' concerns and enables them to express their thoughts and behaviors more authentically, thus ensuring the accuracy and reliability of the data to some extent.

In this study, some of the scales were originally in English. To ensure the applicability and accuracy of these English scales in the Chinese context, this study carried out a systematic translation and back-translation process. The specific steps are as follows: first, three experts with relevant domain expertise independently translated the English scales into Chinese. Then, the research team compared and discussed the three translated versions in detail to integrate them into a unified Chinese version. Next, a bilingual expert was invited to

back-translate the integrated Chinese version into English and compare it with the original English scales to ensure the accuracy and consistency of the translation, preventing semantic bias or ambiguity.

Moreover, in the questionnaire design process, this study fully referred to best practices in cross-cultural research from related literature, focusing on the universality of language expression to reduce understanding biases that might arise due to participants' educational background and cultural differences. To achieve this, the study avoided using overly specialized or academic terms in the questionnaire and ensured that the phrasing of questions remained neutral, avoiding biased or controversial content that could interfere with participants' responses. Through the above translation process and questionnaire design optimization, this study aimed to ensure that the questionnaire content remained faithful to the core concepts of the original scales while conforming to the expression habits of the Chinese context, thereby ensuring the reliability and validity of the research data.

In this study, a 7-point Likert scale (1 = "Strongly Disagree," 2 = "Disagree," 3 = "Neutral," 4 = "Agree," 5 = "Strongly Agree") was used because it offers a balanced range of response options. Data were analyzed using SPSS version 20.0.

4.1.1 Data

We distributed the questionnaire and collected data through "Wenjuanxing" (a Chinese online survey platform). With the development of information technology and smart devices, this platform has been widely used in research.

The sample was drawn from medical administrative teams in Chinese hospitals, with each team comprising one team leader and 3-5 members. We developed two distinct questionnaires: a team leader questionnaire and a team member questionnaire. The leader's questionnaire measured all study variables, while the member's questionnaire excluded variables pertaining to leaders' personal characteristics.

Distribution followed two channels: (1) Targeted the survey link through internal hospital management systems of partner institutions，ensuring that one team leader and 3–5 members participated; (2) Direct provision of QR code links for scanning. Anonymous responses were collected with access controls verifying respondents' employment status (e.g., hospital ID authentication), The survey was administered by the team leaders, who were asked to recruit 3–5 team members to participate.

A total of 319 hospital team datasets were collected. Data from teams with fewer than three members and data with errors that could not be matched were excluded. In the end, the final sample consisted of 291 teams, from 63 different hospitals, mainly from Shenzhen, Chongqing, Shandong, Henan, and Guizhou. These hospitals are listed in Table 4.1. The participating teams had an average size of 4.75 members. The survey participants comprised 45.7% males and 54.3% females. The average age of the respondents was 45.6 years, with a mean work experience of 16.9 years.

Table 4.1 Name list of the hospitals in this study

No.	Name	Province	Hospital Tier	Category
1	Shenzhen Bao'an Traditional Chinese Medicine Hospital	GanSu	Grade 2, Class A	General Hospital
2	Shaoyang Traditional Chinese Medicine Hospital, Hunan	GuangDong	Grade 2, Class A	General Hospital
3	Longgang Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 3, Class A	Maternity and Child Health Hospital
4	Longgang Central Hospital, Shenzhen	GuangDong	Grade 2, Class A	General Hospital
5	Longgang District People's Hospital, Shenzhen	GuangDong	Grade 3	Specialty Hospital (Psychiatric)
6	Affiliated Hospital of Southern University of Science and Technology	GuangDong	Grade 3, Class A	General Hospital
7	Nanfang Hospital, Southern Medical University	GuangDong	Grade 2, Class A	Specialty Hospital (Psychiatric)
8	Xi'an People's Hospital	GuangDong	Grade 2, Class A	General Hospital
9	Fuyong People's Hospital, Bao'an District, Shenzhen	GuangDong	Grade 2, Class A	General Hospital
10	Shenzhen Second People's Hospital	GuiZhou	Grade 2, Class A	Maternity and Child Health Hospital
11	The Eighth Affiliated Hospital, Sun Yat-sen University	HeNan	Grade 2, Class A	General Hospital
12	Shangcai County People's Hospital, Zhumadian, Henan	HuNan	Grade 3, Class A	Hospital of Traditional Chinese Medicine
13	Shenzhen Hospital, Guangzhou University of Chinese Medicine	HuNan	Grade 3	Maternity and Child Health Hospital
14	The Third People's Hospital, Longgang District, Shenzhen	ShanDong	Grade 2, Class A	General Hospital
15	Luohu Maternal and Child Health Hospital, Shenzhen	ShaanXi	Grade 3, Class B	General Hospital
16	Peking University Shenzhen Hospital	ShaanXi	Grade 2, Class A	Hospital of Traditional Chinese Medicine
17	Nanhai Hospital, Guangdong Provincial People's Hospital	ShaanXi	Grade 3, Class A	General Hospital
18	Ziyang County Traditional Chinese Medicine Hospital, Ankang, Shaanxi	ShaanXi	Grade 2, Class A	General Hospital
19	Shenzhen University General Hospital	ShaanXi	Grade 3, Class A	General Hospital
20	Longhua District Maternal and Child	ShaanXi	Grade 3, Class A	Specialty Hospital

No.	Name	Province	Hospital Tier	Category
	Health Hospital, Shenzhen			(Chest Disease)
21	Pingshan District People's Hospital, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
22	The Fourth People's Hospital, Nanhai District, Foshan	GuangDong	Grade 2, Class A	General Hospital
23	Linyi County People's Hospital, Shandong	GuangDong	Grade 3, Class A	Maternity and Child Health Hospital
24	Guangming District Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
25	Pingshan District Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 2, Class A	General Hospital
26	The Third People's Hospital, Zhongshan, Guangdong	GuangDong	Grade 2, Class A	General Hospital
27	Longhua District Central Hospital, Shenzhen	GuangDong	Grade 3	General Hospital
28	The Second People's Hospital, Yubei District, Chongqing	GuangDong	Grade 3, Class A	Hospital of Traditional Chinese Medicine
29	215th Hospital of Nuclear Industry, Shaanxi	GuangDong	Grade 3, Class A	General Hospital
30	Bao'an Central Hospital, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
31	The Second People's Hospital, Longgang District, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
32	Shenzhen Children's Hospital	GuangDong	Grade 3, Class A	Specialty Hospital (Children)
33	Bao'an District People's Hospital, Shenzhen	GuangDong	Grade 2, Class A	General Hospital
34	The Second People's Hospital, Futian District, Shenzhen	GuangDong	Grade 2, Class A	Maternity and Child Health Hospital
35	Shenzhen People's Hospital	GuangDong	Grade 3, Class A	Maternity and Child Health Hospital
36	Longkou People's Hospital, Shandong	GuangDong	Grade 2, Class A	Maternity and Child Health Hospital
37	Nanchuan District People's Hospital, Chongqing	GuangDong	Grade 3	General Hospital
38	Songgang People's Hospital, Bao'an District, Shenzhen	GuangDong	Grade 3, Class A	Hospital of Traditional Chinese Medicine
39	Sanxiang Hospital, Zhongshan, Guangdong	GuangDong	Grade 3, Class A	Specialty Hospital (Psychiatric)
40	Weibei Central Hospital, Dali County, Weinan, Shaanxi	GuangDong	Grade 2, Class A	General Hospital
41	The Third Yuebei People's Hospital, Shaoguan, Guangdong	GuangDong	Grade 2, Class A	General Hospital
42	Shenzhen Nanshan People's Hospital	GuangDong	Grade 3, Class A	Maternity and Child Health Hospital
43	Yiyang Maternal and Child Health Hospital, Hunan	GuangDong	Grade 3, Class A	General Hospital
44	Guangzhou Women and Children's	GuangDong	Grade 3, Class A	General Hospital

No.	Name	Province	Hospital Tier	Category
	Medical Center, Guangzhou Medical University			
45	Guzhen People's Hospital, Zhongshan, Guangdong	GuangDong	Grade 2, Class A	Maternity and Child Health Hospital
46	Guangming District People's Hospital, Shenzhen	GuangDong	Grade 3	General Hospital
47	Shenzhen Eye Hospital	GuangDong	Grade 2, Class A	Maternity and Child Health Hospital
48	The Third People's Hospital, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
49	Futian District Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 3	General Hospital
50	Xi'an Chest Hospital, Shaanxi	GuangDong	Grade 3	General Hospital
51	Pingshan District Traditional Chinese Medicine Hospital, Shenzhen	GuangDong	Grade 3	Maternity and Child Health Hospital
52	Bao'an District Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 3, Class A	General Hospital
53	Yantian District People's Hospital, Shenzhen	GuangDong	Grade 2	Maternity and Child Health Hospital
54	Shiyan People's Hospital, Bao'an District, Shenzhen	GuangDong	Grade 3	General Hospital
55	Shenzhen Kangning Hospital	GuangDong	Grade 2, Class A	Hospital of Traditional Chinese Medicine
56	Shenzhen Maternal and Child Health Hospital	GuangDong	Grade 3, Class A	General Hospital
57	Tongnan District Traditional Chinese Medicine Hospital, Chongqing	GuangDong	Grade 2, Class A	General Hospital
58	Nanming District Maternal and Child Health Hospital, Guiyang, Guizhou	GuangDong	Grade 3, Class A	Specialty Hospital (Ophthalmology)
59	Nanshan District Maternal and Child Health Hospital, Shenzhen	GuangDong	Grade 3, Class A	Specialty Hospital (Oncology)
60	Shenzhen Hospital of Integrated Traditional Chinese and Western Medicine	GuangDong	Grade 3, Class A	Hospital of Traditional Chinese Medicine
61	The Second People's Hospital, Dingxi, Gansu	ChongQing	Grade 3, Class A	General Hospital
62	Luohu District People's Hospital, Shenzhen	ChongQing	Grade 3, Class A	Hospital of Traditional Chinese Medicine
63	Cancer Hospital, Chinese Academy of Medical Sciences, Shenzhen	ChongQing	Grade 2, Class A	General Hospital

4.1.2 Variables

The measured variables encompassed three dimensions: organizational factors, team factors, and team leader factors. Specifically, variables at the team leader level were assessed exclusively by team leaders through self-reporting. Variables at the organizational and team

levels were jointly evaluated by both leaders and members, with responses subsequently aggregated by taking the mean value across raters to ensure multi-source validation and enhance measurement reliability. All scales and items are list in Table 4.2.

Table 4.2 Scales

Scales	No.	Item
Hospital service culture scale	1.	How would you rate your hospital's knowledge and skill level in providing high-quality service to patients?
	2.	How would you rate your hospital's efforts in providing high-level service?
	3.	How would you rate the recognition and rewards your hospital staff receive for providing high-quality service?
	4.	How would you rate the overall quality of the services provided by your hospital?
	5.	How would you rate the leadership shown by your hospital's management in supporting the provision of high-quality services?
	6.	How would you rate your hospital's efforts in facilitating communication between employees and patients?
	7.	How would you rate the logistical support your hospital provides to help you deliver high-quality services?
Hospital data center completeness scale	1.	How would you rate the completeness of your hospital's data center construction?
	2.	How would you rate the usability of your hospital's data platform?
	3.	How would you rate the quality of the existing data in your hospital's data center?
	4.	How would you rate the utilization level of the existing data in your hospital's data center?
Inter-team collaboration scale	1.	Our team maintains a harmonious relationship with the medical department team.
	2.	Team members from both teams collaborate frequently, and tasks are rarely completed individually.
	3.	The level of collaboration between team members from both teams is high.
	4.	Team members from both teams are willing to make personal sacrifices for the other team.
	5.	There is frequent sharing between team members from both teams.
Team resource scarcity scale	1.	Our team's data resources are scarce.
	2.	Our team's data resources are not available for free use by all teams.
	3.	It is difficult to obtain all necessary data resources from other teams.
	4.	Without our team's data, other departments may experience data resource shortages.
	5.	Our team's ability to acquire, retain, and analyze data is highly valuable.
Data sharing behavior scale	1.	We always actively share our data with the medical department.
	2.	Whenever we have the data needed by the medical department, we share it with them without reservation.
	3.	Data sharing between us and the medical department is frequent.
	4.	We always provide the hard-to-obtain data we possess to the medical department free of charge.
Data sharing intention scale	1.	Our team will try to share data with the medical department.
	2.	Our team will make an effort to share data with the medical department.
	3.	Our team is willing to share data with the medical department.
Responsibility	1.	I always complete trivial tasks immediately.

Scales	No.	Item
scale	2.	I often forget to put things back where they belong.
	3.	I like order.
	4.	I often make a mess of things.
Positive personality scale	1.	I always strive to enhance everyone's happiness.
	2.	I always work to benefit others.
	3.	I hope to bring positive changes to everyone's lives.
Leader-leader relationship scale	1.	During holidays or non-working hours, we contact or visit each other via phone.
	2.	We often invite each other to dinner at home.
	3.	On special occasions (e.g., birthdays), we gather for meals or exchange gifts.
	4.	We share our thoughts, problems, needs, and feelings with each other.
	5.	We understand each other's family and work situation.
	6.	When there are conflicting viewpoints, we always stand by each other.
Privacy protection awareness scale	1.	I control the disclosure of team data privacy information.
	2.	I am familiar with legal regulations regarding privacy protection.
	3.	I possess the necessary skills to protect data privacy.
	4.	I am aware of my rights to protect privacy.

4.1.2.1 Organizational factors

The variables refer to organizational factors include hospital service culture and completeness of hospital data centers.

Hospital service culture

This study used the "service culture scale" which was developed by Schneider et al. (1998) for measurement and it comprises 7 items. According to Kuder-Richardson Reliability, we statistically calculated Cronbach's α (at the spectrum of 0 to 1), which is required to be above 0.7 to express high reliability of the scale.

The Cronbach's α of the scale is 0.947 for 7 items, which demonstrates a strong consistency within all items to the purpose.

Completeness of hospital data centers

To measure the completeness of hospital data centers, this study developed a scale based on the "Local Government Data Open Report (Second Half of 2019)", proposing an evaluation framework covering readiness, platform layer, data layer, and utilization layer. Four items were used to assess the completeness of hospital data centers. The Cronbach's α of the scale is 0.946 for the 4 items, indicating strong internal consistency among the items with respect to their intended purpose.

4.1.2.2 Team factors

The variables refer to team factors include inter-team collaboration, team resource scarcity, data sharing behavior, and data sharing intention.

Inter-team collaboration

This study used the inter-team collaboration scale developed by Chatman, & Flynn (2001) to measure the extent of collaboration between medical administrative teams. This scale consists of 5 items. The Cronbach's α of the scale is 0.894 for 5 items, which demonstrates a strong consistency within all items to the purpose.

Team resource scarcity

This study adapted the scale used by Ni (2021), which was originally adapted from Stefan et al. (2018), to measure team resource scarcity. The scale consists of 5 items. The Cronbach's α of the scale is 0.742 for 5 items, which demonstrates a strong consistency within all items to the purpose.

Data sharing behavior

This study adapted the knowledge-sharing scale developed by Faraj et al. (2000) for measuring data sharing behavior of medical administrative teams in Chinese hospitals. This scale consists of 4 items. The Cronbach's α of the scale is 0.921 for 4 items, which demonstrates a strong consistency within all items to the purpose.

Data sharing intention

This study adapted the data sharing intention scale developed by Chen (2021), which was originally adapted from Hsiu-Fen Lin (2007). This scale consists of 3 items. The Cronbach's α of the scale is 0.942 for 3 items, which demonstrates a strong consistency within all items to the purpose.

4.1.2.3 Team leader factors

The variables refer to team leader factors include responsibility, positive personality of team leader, leader-leader relationship, and privacy protection awareness.

Responsibility

This study used the scale developed by Donnellan et al. (2006) to measure responsibility, which includes five items, with the second and fourth items being reverse-scored. The Cronbach's α of the scale is 0.776 for 4 items, which demonstrates a strong consistency within all items to the purpose.

Positive personality

This study used the scale developed by to measure positive personality of team leader (Grant & Rothbard, 2013), and it includes 3 items. The Cronbach's α of the scale is 0.945 for 3 items, which demonstrates a strong consistency within all items to the purpose.

Leader-leader relationship

This study adapted the Leader-Leader relationship scale developed by Law et al to measure the “Guanxi” with other team leaders that perceived by team leader (Kwok & Gao, 2004). Six items were considered to address this issue. The Cronbach’s α for the six items is 0.872, indicating strong internal consistency across all items for the intended purpose.

Privacy protection awareness

This study adapted the privacy protection scale developed by to measure privacy protection awareness of team leader (Li, 2022), which includes 4 items. The internal consistency reliability coefficient of the scale is 0.840 for 4 items, which demonstrates a strong consistency within all items to the purpose.

4.1.2.4 Control variables

This study employed several control variables in the models including age, gender, education level, and work tenure. Different age of teams may have differences in cognition and concepts. Gender may lead to differences in communication styles and team collaboration methods. Education level may determine the team's understanding and implementation of data sharing. Work tenure not only reflects the team’s experience and professional ability but also indicates the adaptability to the hospital's values and norms.

4.1.2.5 Medical data sharing in Chinese hospitals

In the survey, the completeness of hospital data centers, medical data sharing intention, and medical data sharing behavior provide a first glimpse into the state of medical data exchange.

Completeness of hospital data centers

This variable was measured with a 7-point Likert scale. After scoring, values from 1.00 to 7.00 indicate levels from “very incomplete” to “very complete.” In our sample the minimum was 1.00 and the maximum 7.00, showing that respondents’ evaluations ranged from highly negative to highly positive, evidencing notable diversity. The scores of all sample hospitals are listed in Table 4.3.

The mean score for completeness of hospital data centers is 4.53, slightly above the scale midpoint (4.00). Overall, participants viewed their centers as moderately complete, though enthusiasm was tempered.

The standard deviation is 1.03. Relative to the scale range, this indicates moderate dispersion: while most ratings cluster around the mean, a substantial minority diverged markedly, underscoring heterogeneity in perceived infrastructure readiness.

Table 4.3 Perceived Level of completeness of hospital data centers

No.	Name	Level
1	Shenzhen Nanshan District People's Hospital	5.85
2	Longkou People's Hospital, Shandong	5.75
3	Tongnan District Traditional Chinese Medicine Hospital, Chongqing	5.75
4	The Second People's Hospital of Dingxi, Gansu	5.69
5	Shangcai County People's Hospital, Zhumadian, Henan	5.50
6	Shenzhen People's Hospital	5.19
7	Shenzhen University General Hospital	5.15
8	The Eighth Affiliated Hospital of Sun Yat-sen University	5.13
9	Longgang Central Hospital, Shenzhen	5.13
10	Cancer Hospital, Chinese Academy of Medical Sciences, Shenzhen	5.13
11	Shenzhen Bao'an Traditional Chinese Medicine Hospital	5.10
12	Bao'an District Maternal and Child Health Care Hospital, Shenzhen	5.06
13	215 Hospital of Nuclear Industry, Shaanxi	5.00
14	Fuyong People's Hospital, Bao'an District, Shenzhen	5.00
15	Nanfang Hospital, Southern Medical University, Shenzhen	5.00
16	Guangzhou Women and Children's Medical Center, Guangzhou Medical University	4.95
17	Luohu District People's Hospital, Shenzhen	4.95
18	Bao'an Central Hospital, Shenzhen	4.80
19	Longgang District People's Hospital, Shenzhen	4.79
20	The Third People's Hospital, Shenzhen	4.75
21	Shiyan People's Hospital, Bao'an District, Shenzhen	4.70
22	Longhua District Maternal and Child Health Care Hospital, Shenzhen	4.70
23	Nanchuan District People's Hospital, Chongqing	4.70
24	The Third People's Hospital of Longgang District, Shenzhen	4.65
25	Nanming District Maternal and Child Health Care Hospital, Guiyang, Guizhou	4.55
26	Nanshan District Maternal and Child Health Care Hospital, Shenzhen	4.54
27	Nanhai Hospital, Guangdong Provincial People's Hospital	4.50
28	Yiyang Maternal and Child Health Care Hospital, Hunan	4.50
29	Linyi County People's Hospital, Shandong	4.50
30	Shenzhen Children's Hospital	4.50
31	Guangming District People's Hospital, Shenzhen	4.50
32	Shenzhen Hospital of Guangzhou University of Chinese Medicine	4.50
33	The Third Yuebei People's Hospital, Shaoguan, Guangdong	4.45
34	Shenzhen Maternal and Child Health Care Hospital	4.45
35	The Fourth People's Hospital of Nanhai District, Foshan, Guangdong	4.44
36	Xi'an People's Hospital, Shaanxi	4.44
37	The Third People's Hospital of Zhongshan, Guangdong	4.42
38	Weibei Central Hospital, Dali County, Weinan, Shaanxi	4.42
39	Ziyang County Traditional Chinese Medicine Hospital, Ankang, Shaanxi	4.40
40	Guzhen People's Hospital, Zhongshan, Guangdong	4.35
41	Songgang People's Hospital, Bao'an District, Shenzhen	4.30
42	The Second People's Hospital of Yubei District, Chongqing	4.30
43	Guangming District Maternal and Child Health Care Hospital, Shenzhen	4.25
44	Longhua Central Hospital, Shenzhen	4.25
45	Affiliated Hospital of Southern University of Science and Technology	4.25
46	Bao'an District People's Hospital, Shenzhen	4.19
47	Pingshan District Maternal and Child Health Care Hospital, Shenzhen	4.15
48	Yantian District People's Hospital, Shenzhen	4.15
49	Shenzhen Hospital of Integrated Traditional Chinese and Western Medicine	4.15
50	Longgang District Maternal and Child Health Care Hospital, Shenzhen	4.13
51	Shenzhen Second People's Hospital	4.10
52	Shenzhen Kangning Hospital	4.08

No.	Name	Level
53	Sanxiang Hospital, Zhongshan, Guangdong	4.00
54	Shaoyang Traditional Chinese Medicine Hospital, Hunan	4.00
55	Futian District Maternal and Child Health Care Hospital, Shenzhen	4.00
56	Peking University Shenzhen Hospital	3.92
57	Pingshan District Traditional Chinese Medicine Hospital, Shenzhen	3.90
58	The Second People's Hospital of Futian District, Shenzhen	3.83
59	Shenzhen Eye Hospital	3.75
60	Xi'an Chest Hospital, Shaanxi	3.69
61	Luohu District Maternal and Child Health Care Hospital, Shenzhen	3.69
62	The Second People's Hospital of Longgang District, Shenzhen	3.65
63	Pingshan District People's Hospital, Shenzhen	3.10

Medical data sharing intention

Medical data sharing intention was measured with a 7-point Likert scale; after scoring, values from 1.00 to 7.00 represent intention ranging from very low to very high. In this study the minimum was 1.00 and the maximum 7.00, indicating that respondents' attitudes varied from highly unwilling to highly willing, evidencing pronounced diversity. The scores of all sample hospitals are listed in Table 4.4.

The mean of Medical data sharing intention is 5.84, significantly above the scale midpoint, showing that the sampled medical administrative teams generally hold a strong intention to share data.

The standard deviation is 1.31, the largest among the three variables, denoting the most dispersed distribution. Thus, intention differs markedly across teams: some are extremely willing, whereas others are reluctant.

Table 4.4 Perceived Level of medical data sharing intention

No.	Name	Level
1	The Eighth Affiliated Hospital, Sun Yat-sen University	7.00
2	The Fourth People's Hospital of Nanhai District, Foshan	6.92
3	Shenzhen Bao'an Traditional Chinese Medicine Hospital	6.67
4	Shenzhen Bao'an Central Hospital	6.60
5	The Third People's Hospital of Longgang District, Shenzhen	6.60
6	Longgang Maternal and Child Health Care Hospital, Shenzhen	6.58
7	Longgang Central Hospital, Shenzhen	6.56
8	Shaoyang Traditional Chinese Medicine Hospital, Hunan	6.53
9	Shenzhen Second People's Hospital	6.53
10	Luohu Maternal and Child Health Care Hospital, Shenzhen	6.50
11	Affiliated Hospital of Southern University of Science and Technology	6.50
12	Nanfang Hospital, Southern Medical University, Shenzhen	6.50
13	The Third Yuebei People's Hospital, Shaoguan, Guangdong	6.47
14	Longgang District People's Hospital, Shenzhen	6.44
15	Nanhai Hospital, Guangdong Provincial People's Hospital	6.33
16	The Third People's Hospital of Zhongshan, Guangdong	6.33
17	Shenzhen Hospital of Guangzhou University of Chinese Medicine	6.33
18	Ziyang County Traditional Chinese Medicine Hospital, Ankang, Shaanxi	6.27
19	Shenzhen Bao'an People's Hospital	6.25
20	215th Hospital of Nuclear Industry, Shaanxi	6.20

No.	Name	Level
21	Shenzhen University General Hospital	6.20
22	Futian Maternal and Child Health Care Hospital, Shenzhen	6.20
23	Longhua Maternal and Child Health Care Hospital, Shenzhen	6.20
24	Guangming Maternal and Child Health Care Hospital, Shenzhen	6.17
25	The Second People's Hospital of Futian District, Shenzhen	6.11
26	Pingshan Maternal and Child Health Care Hospital, Shenzhen	6.07
27	Pingshan District People's Hospital, Shenzhen	6.07
28	Nanchuan District People's Hospital, Chongqing	6.07
29	Guangzhou Women and Children's Medical Center, Guangzhou Medical University	6.00
30	The Second People's Hospital of Longgang District, Shenzhen	6.00
31	Longhua Central Hospital, Shenzhen	6.00
32	The Second People's Hospital of Yubei District, Chongqing	6.00
33	Longkou People's Hospital, Shandong	5.93
34	Fuyong People's Hospital, Bao'an District, Shenzhen	5.93
35	Sanxiang Hospital, Zhongshan, Guangdong	5.92
36	Shangcai County People's Hospital, Zhumadian, Henan	5.89
37	Linyi County People's Hospital, Shandong	5.89
38	Shenzhen Nanshan People's Hospital	5.87
39	Shenzhen People's Hospital	5.83
40	Songgang People's Hospital, Bao'an District, Shenzhen	5.80
41	Guzhen People's Hospital, Zhongshan, Guangdong	5.67
42	Shenzhen Maternal and Child Health Care Hospital	5.67
43	Shenzhen Eye Hospital	5.67
44	Peking University Shenzhen Hospital	5.56
45	Weibei Central Hospital, Dali County, Weinan, Shaanxi	5.44
46	Yiyang Maternal and Child Health Care Hospital, Hunan	5.33
47	Shenzhen Children's Hospital	5.33
48	Guangming District People's Hospital, Shenzhen	5.33
49	Yantian District People's Hospital, Shenzhen	5.27
50	Xi'an Chest Hospital, Shaanxi	5.25
51	Nanshan District Maternal and Child Health Care Hospital, Shenzhen	5.11
52	Pingshan District Traditional Chinese Medicine Hospital, Shenzhen	5.07
53	Shenzhen Hospital of Integrated Traditional Chinese and Western Medicine	5.07
54	The Third People's Hospital, Shenzhen	4.89
55	Shenzhen Kangning Hospital	4.89
56	Nanming District Maternal and Child Health Care Hospital, Guiyang, Guizhou	4.80
57	Shiyan People's Hospital, Bao'an District, Shenzhen	4.80
58	Bao'an District Maternal and Child Health Care Hospital, Shenzhen	4.75
59	Xi'an People's Hospital, Shaanxi	4.67
60	Luohu District People's Hospital, Shenzhen	4.67
61	Cancer Hospital, Chinese Academy of Medical Sciences, Shenzhen	4.58
62	Tongnan District Traditional Chinese Medicine Hospital, Chongqing	4.50
63	The Second People's Hospital of Dingxi, Gansu	4.00

Medical data sharing behavior

Medical data sharing behavior was likewise recorded on a 7-point Likert scale, with 1.00–7.00 reflecting behavior from never sharing to always sharing. The observed minimum was 1.00 and the maximum 7.00, revealing a wide spectrum of actual sharing practices. The scores of all sample hospitals are listed in Table 4.5.

The mean score for Medical data sharing behavior is 5.68, slightly lower than the intention mean yet still exceeding the mean for Completeness of Hospital Data Centers. This

suggests that respondents are fairly active in real-world sharing, though their behavior lags marginally behind their stated willingness.

The standard deviation for behavior is 1.31, mirroring that of intention and confirming a broad spread: some teams share frequently, while others seldom do.

Table 4.5 Perceived Level of medical data sharing behavior in this study

No.	Name	Level
1	Shenzhen Bao'an Traditional Chinese Medicine Hospital	7.00
2	Shaoyang Traditional Chinese Medicine Hospital, Hunan	6.70
3	Longgang Maternal and Child Health Hospital, Shenzhen	6.69
4	Longgang Central Hospital, Shenzhen	6.54
5	Longgang District People's Hospital, Shenzhen	6.50
6	Affiliated Hospital of Southern University of Science and Technology, Shenzhen	6.44
7	Nanfang Hospital of Southern Medical University, Shenzhen	6.44
8	Xi'an People's Hospital, Shaanxi	6.31
9	Fuyong People's Hospital of Bao'an District, Shenzhen	6.30
10	Shenzhen Second People's Hospital	6.30
11	The Eighth Affiliated Hospital of Sun Yat-sen University, Guangdong	6.25
12	Shangcai County People's Hospital, Zhumadian, Henan	6.25
13	Shenzhen Hospital of Guangzhou University of Chinese Medicine	6.25
14	The Third People's Hospital of Longgang District, Shenzhen	6.20
15	Luohu Maternal and Child Health Hospital, Shenzhen	6.19
16	Peking University Shenzhen Hospital	6.17
17	Nanhai Hospital of Guangdong Provincial People's Hospital	6.15
18	Ziyang County Traditional Chinese Medicine Hospital, Ankang, Shaanxi	6.15
19	Shenzhen University General Hospital	6.10
20	Longhua District Maternal and Child Health Hospital, Shenzhen	6.10
21	Pingshan District People's Hospital, Shenzhen	6.10
22	The Fourth People's Hospital of Nanhai District, Foshan, Guangdong	6.00
23	Linyi County People's Hospital, Shandong	6.00
24	Guangming District Maternal and Child Health Hospital, Shenzhen	5.96
25	Pingshan District Maternal and Child Health Hospital, Shenzhen	5.95
26	The Third People's Hospital of Zhongshan, Guangdong	5.92
27	Longhua District Central Hospital, Shenzhen	5.90
28	The Second People's Hospital of Yubei District, Chongqing	5.90
29	215th Hospital of Nuclear Industry, Shaanxi	5.85
30	Bao'an Central Hospital, Shenzhen	5.85
31	The Second People's Hospital of Longgang District, Shenzhen	5.85
32	Shenzhen Children's Hospital	5.81
33	Bao'an District People's Hospital, Shenzhen	5.75
34	The Second People's Hospital of Futian District, Shenzhen	5.75
35	Shenzhen People's Hospital	5.75
36	Longkou People's Hospital, Shandong	5.70
37	Nanchuan District People's Hospital, Chongqing	5.70
38	Songgang People's Hospital of Bao'an District, Shenzhen	5.60
39	Sanxiang Hospital of Zhongshan, Guangdong	5.50
40	Weibei Central Hospital, Dali County, Weinan, Shaanxi	5.50
41	The Third Yuebei People's Hospital of Shaoguan, Guangdong	5.45
42	Shenzhen Nanshan People's Hospital	5.40
43	Yiyang Maternal and Child Health Hospital, Hunan	5.38
44	Guangzhou Women and Children's Medical Center, Guangzhou Medical University	5.35
45	Guzhen People's Hospital of Zhongshan, Guangdong	5.30
46	Guangming District People's Hospital, Shenzhen	5.30

No.	Name	Level
47	Shenzhen Eye Hospital	5.25
48	The Third People's Hospital of Shenzhen	5.21
49	Futian District Maternal and Child Health Hospital, Shenzhen	5.20
50	Xi'an Chest Hospital, Shaanxi	5.19
51	Pingshan District Traditional Chinese Medicine Hospital, Shenzhen	5.15
52	Bao'an District Maternal and Child Health Hospital, Shenzhen	5.06
53	Yantian District People's Hospital, Shenzhen	5.05
54	Shiyan People's Hospital of Bao'an District, Shenzhen	5.00
55	Shenzhen Kangning Hospital	4.92
56	Shenzhen Maternal and Child Health Hospital	4.90
57	Tongnan District Traditional Chinese Medicine Hospital, Chongqing	4.88
58	Nanming District Maternal and Child Health Hospital, Guiyang, Guizhou	4.85
59	Nanshan District Maternal and Child Health Hospital, Shenzhen	4.54
60	Shenzhen Hospital of Integrated Traditional Chinese and Western Medicine	4.50
61	The Second People's Hospital of Dingxi, Gansu	4.25
62	Luohu District People's Hospital, Shenzhen	4.25
63	Cancer Hospital, Chinese Academy of Medical Sciences, Shenzhen	4.25

4.2 Models and estimation method

To test the hypotheses, this study estimates regression models.

4.2.1 Linear regression model

Linear regression is a fundamental statistical method used to examine the linear relationship between a single independent variable (X) and a dependent variable (Y). The mathematical model for simple linear regression can be expressed as:

$$Y=\beta_0+\beta_1 X+\epsilon \tag{4.1}$$

where:

Y is the dependent variable.

X is the independent variable.

$\beta 1$ is the regression coefficient, indicating the change in Y for a one-unit change in X.

4.2.2 Analysis model of moderating effects

For the moderating effect, the mathematical model for a simple moderating effect can be expressed as:

$$Y=\beta_0+\beta_1 X+\beta_2 M+\beta_3 (X\times M)+\epsilon \tag{4.2}$$

where:

Y is the dependent variable.

X is the independent variable.

M is the moderator variable.

$X \times M$ represents the interaction term between the independent variable and the moderator.

$\beta 1$ is the coefficient for the independent variable X.

$\beta 2$ is the coefficient for the moderator variable M.

$\beta 3$ is the coefficient for the interaction term, indicating the extent to which the relationship between X and Y is moderated by M.

In this study, following Hayes' moderation process analysis framework (Hayes, 2018), hospital service culture and hospital data center completeness are examined as moderators. To construct interaction terms (e.g., inter-team collaboration × hospital service culture; responsibility × data center completeness), independent variables (team factors and team leader factors) and moderators were standardized by converting them into Z-scores. Hierarchical regression was then used to assess the moderating effects on the relationships between team factors, team leader factors, and data sharing intention. Collinearity analysis was conducted as well.

4.2.3 Analysis method of moderating effects

Hierarchical regression analysis are conducted based respectively on the moderators hospital service culture and hospital data center completeness. For example, to test hospital service culture as a moderator, we entered predicted variables in the initial block. In the second block, hospital service culture was added to examine the potential moderating effect on the relationships in this context. In the third block, 2-way interaction terms including hospital service culture and predicted variables that we already computed were added. For the other moderating variable hospital data center completeness, we followed the same procedure. To figure out how moderators influencing the relationships between independent variables and data sharing intention, two-way standardized interaction effects were identified by interpreting plot with simple slope test (Dawson, 2014). With the results drawn out from our tests, further study will be conducted to segment in the sample groups and understand the influence of each moderators on the relationships, implementing selection variables with specific rules in linear regression analysis process.

4.3 Analysis and hypotheses test

The data analysis comprised three steps. confirmatory factor analysis (CFA) was first conducted to ensure discriminant validity among variables. Then, descriptive analysis was performed to provide an overview of the data. Finally, the hypotheses were tested.

4.3.1 Confirmatory factor analysis

In addition to demographic variables, this study included 10 measured variables, 6 of them are measured by both team leader and members, including hospital service culture, completeness of hospital data centers, inter-team collaboration, team resource scarcity, data sharing behavior, and data sharing intention. Before hypothesis testing, confirmatory factor analysis (CFA) was performed using Amos17.0 to ensure discriminant validity among the variables, as shown in Table 4.6.

Table 4.6 Comparison of measurement models for main variables

model	factor	x^2	*df*	RMSEA	GFI	CFI	IFI
1	6-factor-model: hospital service culture, completeness of hospital data centers, inter-team collaboration, team resource scarcity, data sharing intention, data sharing behavior	199.90	102	0.07	0.87	0.89	0.91
2	5-factor-model: combine data sharing intention & data sharing behavior as a factor	252.78	115	0.08	0.77	0.83	0.89
3	4-factor-model: combine hospital service culture & completeness of hospital data centers as a factor	359.18	123	0.09	0.74	0.81	0.84
4	3-factor-model: combine inter-team collaboration, team resource scarcity as a factor	503.27	137	0.12	0.61	0.67	0.68

The hypothesized model exhibited the best goodness-of-fit, while alternative competing models demonstrated inferior fit indices compared to the original model. The results confirmed that all measured variables in this study demonstrated discriminant validity.

4.3.2 Descriptive statistics

The means and standard deviations of the variables in the empirical study are shown in Table 4.7.

Team leaders' positive personality (Mean=6.43, S.D.=1.134) and privacy protection awareness (Mean=6.18, S.D.=0.867) received the highest scores, indicating strong perceived

performance in these areas. The low standard deviation of privacy protection awareness suggests consistent evaluations. Team leader responsibility (Mean=6.00, S.D.=0.888) also scored highly, aligning with the relatively high levels of data sharing intention (Mean=5.84) and data sharing behavior (Mean=5.68), which reflect typical data-sharing practices in the sample.

Team leader interpersonal relationships (Mean=4.16, S.D.=1.354) and team resource scarcity (Mean=4.38, S.D.=1.155) scored the lowest, with high standard deviations indicating significant variability in perceived weaknesses.

Hospital service culture (Mean=5.54, S.D.=0.906) was rated higher than hospital data center completeness (Mean=4.53, S.D.=1.031), suggesting better cultural alignment compared to technical infrastructure readiness.

The correlation analysis shows that the data sharing intention (which is the main variable that was affected in this study), is significantly correlated with other variables. The internal consistency reliability coefficients (Cronbach's α) of all the measurements are all above 0.70. Overall, the data support the theoretical relationships between the research variables, laying the foundation for subsequent hypothesis testing.

Table 4.7 Mean, standard deviation and correlation coefficient

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. Hospital Service Culture	5.54	0.906	[0.95]	-	-	-	-	-	-	-	-	-
2. Hospital Data Center Completeness	4.53	1.031	0.59**	[0.95]	-	-	-	-	-	-	-	-
3. Inter-Team Collaboration	5.40	1.158	0.40**	0.28**	[0.90]	-	-	-	-	-	-	-
4. Team Resource Scarcity	4.38	1.155	-0.08	-0.03	0.07	[0.74]	-	-	-	-	-	-
5. Data sharing Behavior	5.68	1.308	0.17**	0.07*	0.59**	-0.03*	[0.92]	-	-	-	-	-
6. Data sharing intention	5.84	1.036	0.17**	0.02*	0.50**	0.04*	0.78**	[0.94]	-	-	-	-
7. Team Leader Responsibility	6.00	0.888	0.26**	0.19**	0.27**	0.06	0.28**	0.27**	[0.78]	-	-	-
8. Team Leader Positive Personality	6.43	1.134	0.23**	0.07	0.26**	0.44	0.32**	0.26**	0.35**	[0.95]	-	-
9. Team Leader Interpersonal Relationships	4.16	1.354	0.27**	0.18**	0.52**	0.13**	0.39**	0.39**	0.18**	0.18**	[0.87]	-
10. Team Leader Privacy Protection Awareness	6.18	0.867	0.25**	0.16**	0.42**	0.20**	0.32**	0.37**	0.49**	0.36**	0.24**	[0.84]

Note: n = 291; *p<0.05, **p<0.01; the numbers in columns represent the variables in line; Diagonal numbers represent internal consistency reliability coefficients.

4.3.3 Impact on data sharing intention

Hypotheses 1a, 1b suggests the positive effect of team factors on data sharing intention; Hypotheses 2a, 2b,2c, 2d proposed the positive effect of team factors on data sharing intention; Hypotheses 3a, 3b proposed the positive effect of team factors on data sharing intention.

Impact of team factors on data sharing intention

In Hypotheses 1a, 1b we postulate that there is a positive effect of inter-team collaboration and team resource scarcity on data sharing intention, and the results of regression analysis are shown in Table 4.8.

Table 4.8 Impact of team factors on data sharing intention

	Variables	Data sharing intention		
		Model 1	Model 2	Model 3
Control Variables	S1			
	Age	0.02	-0.03	0.18
	Gender	-0.12*	-0.07	-0.12*
	Education	0.06	0.03	0.06
	Tenure	0.06	0.11†	0.06
Team Factors	S2 Main Effect inter-team collaboration		0.50*	
	Team Resource Scarcity			0.01
	ΔR^2	0.02	0.24*	0.20
	Total R^2	0.02	0.26*	0.20
	Total F	1.48	20.32*	1.18

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

In hypothesis 1a we formulate that inter-team collaboration is positively related with data sharing intention. Model 1 shows the effects of control variables except gender (β=-0.12, p<0.05) on data sharing intention, are not statistically significant. Model 2 indicates that when the inter-team collaboration is included, control variables have a weak (but statistically significant) effect on the dependent variable, with work experience (β=0.11, p<0.1) having a minor influence, suggesting that individual characteristics have limited predictive power in determining willingness. Model 2 also shows that the regression coefficient for inter-team collaboration is 0.50 (p<0.05), ΔR^2 is 0.24, meaning that inter-team collaboration alone explains 24% of the variation in data sharing intention, with the main effect being statistically significant. Thus, Hypothesis 1a is supported.

In hypothesis 1b we postulate that team resource scarcity is positively related with data sharing intention. Model 3 shows that the estimate for the coefficient of team resource

scarcity is 0.01 (not significant), suggesting that resource scarcity does not significantly suppress data sharing intention. Thus, Hypothesis 1b is unsupported.

Impact of team leader factors on data sharing intention

Hypothesis 2a, 2b, 2c, 2d postulate that team leader's responsibility, positive personality, leader-leader relationships, privacy protection awareness positively affect data sharing intention, and the regression estimation results are shown in Table 4.9.

Table 4.9 Impact of team leader factors on data sharing intention

	Variables	Data sharing intention				
		Model 1	Model 2	Model 3	Model 4	Model 5
	S1					
	Age	0.02	-0.03	-0.04	-0.13	0.01
Control	Gender	-0.12*	-0.13*	-0.13*	-0.07	-0.09
Variables	Education	0.06	0.05	0.06	0.04	0.05
	Tenure	0.06	0.07	0.04	0.08	0.06
	S2 Main Effect					
	Responsibility		0.27*			
Team	Positive Personality			0.27*		
leader	Leader-leader relationships				0.38*	
factors	Privacy protection awareness					0.36*
	ΔR^2	0.02	0.07*	0.07*	0.14*	0.13*
	Total R^2	0.02	0.09*	0.09*	0.16*	0.15*
	Total F	1.48	5.78*	5.50*	11.13*	9.81*

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

The results indicate that leadership responsibility (β=0.27, p<0.05), positive personality (β=0.27, p<0.05), interpersonal relationships (β=0.38, p<0.05), and privacy protection awareness (β=0.36, p<0.05) all have statistically significant positive effects on data sharing intention (Models 2-5). Among these, interpersonal relationships have the strongest explanatory power increase (ΔR^2=0.14, p<0.05), indicating that good cross-team leadership collaboration greatly promotes a data sharing culture. The strong effect of privacy protection awareness (β=0.36, p<0.05) suggests that when leaders prioritize data security, team members' concerns about sharing data decrease, thus increasing their data sharing intention. Overall, the statistical evidence of the sample shows that team leader factors are positively correlated with data sharing intention.

Thus, Hypotheses 2a, 2b, 2c, and 2d are supported by the sample data.

Impact of organizational factors on data sharing intention

Hypothesis 3a, 3b proposes that hospital service culture and completeness of the data center affect data sharing intention, and the regression estimation results are shown in Table 4.10.

In hypothesis 3a we formulate that hospital service culture positively affects data sharing intention. The regression results show that hospital service culture has a statistically significant positive impact on data sharing intention (β=0.16, p<0.01, Model 2), with ΔR^2 being 0.03 (p<0.01), indicating that Hypothesis 3a is supported: completeness of the hospital's data center positively influences data sharing intention. However, the regression results show that the estimate for the coefficient of hospital data center completeness is 0.01 (not statistically significant), indicating that the improvement in technological infrastructure does not directly increase data sharing intention. All the conclusions are based on the statistical evidence of the sample.

Therefore, Hypothesis 3a is supported, while Hypothesis 3b is unsupported.

Table 4.10 Impact of organizational factors on data sharing intention

	Variable	Data sharing intention		
		Model 1	Model 2	Model 3
Control Variables	S1			
	Age	0.02	0.03	0.02
	Gender	-0.12*	-0.11*	-0.12*
	Education	0.06	0.05	0.06
	Tenure	0.06	0.06	0.06
Organizational Factors	S2 Main Effects			
	Hospital Service Culture		0.16**	
	Hospital Data Center Completeness			0.01
	ΔR^2	0.02	0.03**	0.00
	Total R^2	0.02	0.05**	0.20
	Total F	1.48	2.76**	1.19

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

4.3.4 Inter-team data sharing intention and behavior

Hypothesis 4 postulates a direct positive effect of inter-team data sharing intention on sharing behavior. The regression results are shown in Table 4.11.

Table 4.11 Impact test of data sharing intention on data sharing behavior

Variable	Data sharing Behavior	
	Model 1	Model 2
S1		
Age	0.07	0.05
Gender	-0.10	-0.001
Education Level	0.02	-0.02
Work Experience	-0.11	-0.06
S2 Main Effects		
Data sharing intention		0.78***
ΔR^2	0.01	0.59***
Total R^2	0.01	0.60***
Total F	0.97	87.11***

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

The coefficient estimate is as high as 0.78 ($p<0.001$, Model 2), with ΔR^2 of 0.59 ($p<0.001$), indicating that willingness increases the explanatory power in 59 percentage points of the total variation of data sharing intention in the considered sample. Therefore, Hypothesis 4 is supported.

4.3.5 Moderating effects of organizational factors

Hypothesis 5a, 5b proposed that hospital service culture moderates the relationship between inter-team collaboration/resource scarcity and data sharing intention.

The moderating effect of hospital service culture on team factors

The moderating regression analysis of hospital service culture on team factors is shown in Table 4.12. Hypothesis 5a proposes that hospital service culture moderates the relationship between inter-team collaboration and team data sharing intention. The moderation effect test shows that hospital service culture significantly enhances the effect of team collaboration on data sharing intention (interaction term $\beta=0.11$, $p<0.05$, Model 3). Specifically, in hospitals with a stronger service culture, the positive effect of team collaboration on willingness is stronger.

To elucidate the moderating effect, the hospital service culture was divided into two groups based on the mean plus or minus one standard deviation. The relationship between the team collaboration and the data sharing intention was calculated under both high and low levels. Subsequently, a schematic diagram of the moderating effect was drawn, as shown in Figure 4.1. Figure 4.1 indicates that when the level of the hospital service culture is low, the slope of the effect of the team collaboration on the data sharing intention is gentle. In contrast, when the level of the hospital service culture is high, the slope of the effect of the team collaboration on the data sharing intention is steep, meaning that the influence of the team collaboration on the data sharing intention is stronger.

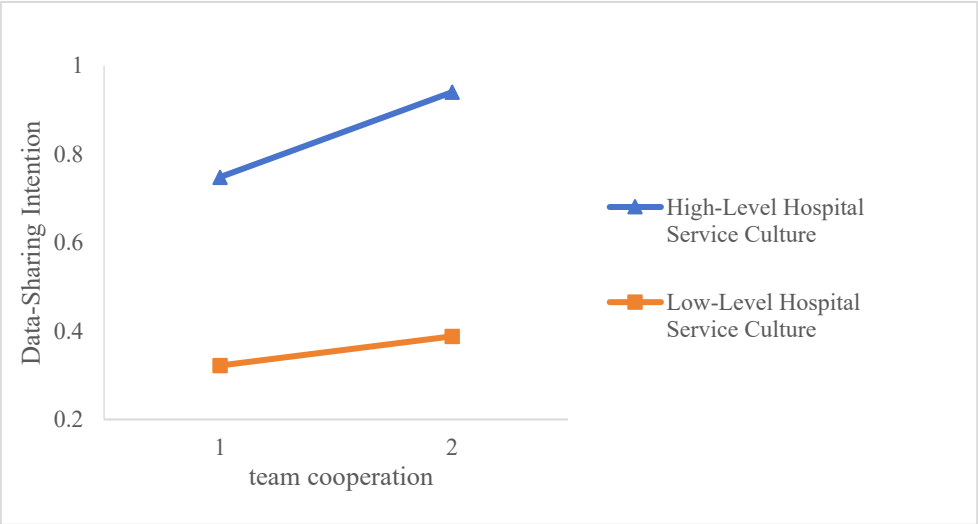


Figure 4.1 Moderating effect of hospital service culture for relationship between team collaboration and team data sharing intention

Hypothesis 5b postulates that hospital service culture moderates the effect of team resource scarcity on team data sharing intention. The moderation effect test shows that the interaction term between service culture and resource scarcity is not statistically significant (β=0.04, Model 5), indicating that the negative impact of resource scarcity is not buffered by service culture. Moreover, the main effect of service culture is 0.17 ($p<0.05$, Model 4), suggesting that service culture itself can directly enhance willingness.

Therefore, Hypothesis 5a is supported, while Hypothesis 5b is not supported.

Table 4.12 Moderating effect of hospital service culture on team factors

Variable	Data sharing Behavior				
	Model 1	Model 2	Model 3	Model 4	Model 5
S1 Control Variables					
Age	0.02	-0.03	-0.02	0.03	0.03
Gender	-0.12*	-0.07	-0.06	-0.10	-0.10
Education Level	0.06	0.04	0.03	0.04	0.04
Work Experience	0.06	0.11	0.10	0.07	0.06
S2 Main Effects					
Team collaboration		0.52	0.50*		
Team Resource Scarcity				0.08	0.07
Hospital Service Culture		-0.04	-0.03	0.17*	0.17*
S3 Moderation Effects					
team collaboration × Hospital Service Culture			0.11*		
Team Resource Scarcity × Hospital Service Culture					0.04
ΔR^2	0.20	0.24*	0.02	0.03	0.001
Total R^2	0.20	0.26*	0.28	0.05	0.05
Total F	1.48	17.01*	15.41*	2.6*	2.3*

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

The moderating effect of hospital service culture on leader factors

Hypothesis 6a, 6b, 6c, 6d proposes that hospital service culture moderates the effect of team leader responsibility, positive personality, leader-leader relationship, and privacy protection awareness on team data sharing intention.

The results of the moderating effect test of hospital service culture on team leadership personal factors are shown in Table 4.13. The moderating effects of hospital service culture on leadership personal factors are partially significant. For example, the interaction term between service culture and privacy protection awareness has a coefficient of 0.11 ($p<0.05$, Model 9), suggesting that in hospitals with a stronger service culture, the positive effect of leadership privacy protection awareness on willingness is stronger. This may be because service culture views data security as part of patient interests, thus aligning privacy protection with sharing goals. However, the interaction terms between service culture and responsibility, as well as positive personality, are not significant, indicating that the moderating effect of culture on leadership traits is selective. Therefore, Hypotheses 6a and 6b are not supported, while Hypotheses 6c and 6d are supported.

To elucidate the moderating effect, the hospital service culture was divided into two groups based on the mean plus or minus one standard deviation. The relationship between the leader-leader relationship/leader-leader relationship and the data sharing intention was calculated under both high and low levels. Subsequently, a schematic diagram of the moderating effect was drawn, as shown in Figure 4.2/4.3. Figure 4.2/4.3 indicates that when the level of the hospital service culture is low, the slope of the effect of the leader-leader relationship/leader-leader relationship on the data sharing intention is gentle. In contrast, when the level of the hospital service culture is high, the slope of the effect of the leader-leader relationship/leader-leader relationship on the data sharing intention is steep, meaning that the influence of the leader-leader relationship/leader-leader relationship on the data sharing intention is stronger.

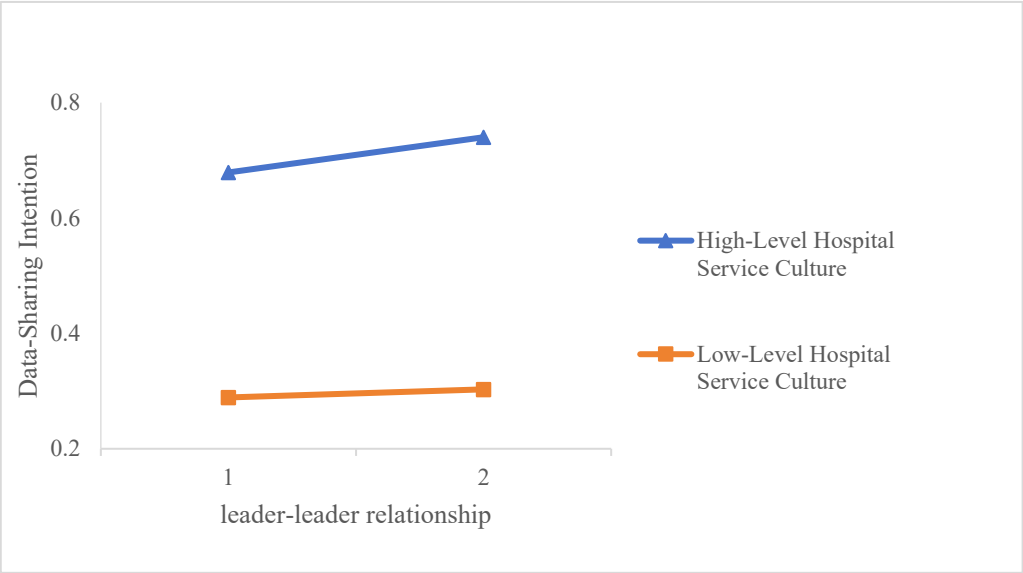


Figure 4.2 Moderating effect of hospital service culture for relationship between leader-leader relationship and team data sharing intention

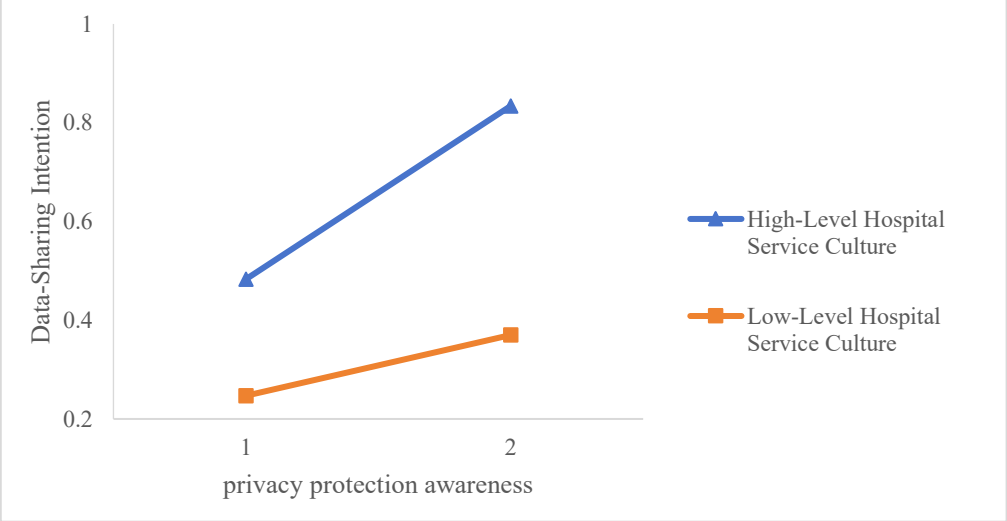


Figure 4.3 Moderating effect of hospital service culture for relationship between privacy protection awareness and team data sharing intention

Table 4.13 Moderating effect of hospital service culture on leader factors

Variable	Data sharing intention								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
S1 Control Variables									
Age	0.02	-0.02	-0.02	-0.03	-0.02	-0.01	0.002	0.01	0.02
Gender	-0.12*	-0.12*	-0.12*	-0.12*	-0.13*	-0.07	-0.07	-0.09	-0.09†
Education Level	0.06	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.05
Work Experience	0.06	0.07	0.07	0.04	0.04	0.08	0.07	0.06	0.06
S2 Main Effects									
Team Leadership Responsibility		0.25*	0.25*						
Team Leadership Positive Personality				0.24*	0.25*				
Team Leadership Relationship		0.10				0.37*	0.35*		
Team Leadership Privacy Awareness								0.34*	0.33*
Hospital Service Culture			0.10	0.10†	0.11†	0.07	0.06	0.08	0.07
S3 Moderating Effects									
Responsibility × Hospital Service Culture			0.004						
Positive Personality × Hospital Service Culture					0.06				
Relationship × Hospital Service Culture							0.10†		
Privacy Awareness × Hospital Service Culture									0.11*
ΔR^2	0.02	0.08	0.00	0.08	0.003	0.15*	0.01†	0.13*	0.01*
Total R^2	0.02	0.10	0.10	0.10	0.10	0.17*	0.18†	0.15*	0.16*
Total F	1.48	5.23*	4.51	5.11*	4.54*	9.51*	8.67*	8.51*	7.91*

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

The moderating effect of hospital data center completeness on team factors

The moderating effect of hospital data center completeness on team factors is shown in Table 4.14. Hypothesis 7a proposes that the completeness of the hospital's data center moderates the effect of team collaboration on team data sharing intention.

Hypothesis 7b proposes that the completeness of the hospital's data center moderates the effect of team resource scarcity on team data sharing intention.

The moderation effect test shows that the moderating effect of data center completeness is weak, with only the interaction term between team collaboration and data center completeness being significant ($\beta=0.12$, $p<0.05$, Model 3). This indicates that in hospitals with more complete data centers, the effect of team collaboration on willingness is stronger, likely because the technological conditions reduce the difficulty of data integration, making collaboration more efficient. However, the interaction term between completeness and resource scarcity is not significant ($\beta=0.001$), suggesting that technological facilities do not mitigate the negative impact of resource scarcity. Overall, data center completeness mainly influences willingness indirectly by enhancing the main effects, but its independent effect is limited. Therefore, Hypothesis 7a is supported, while Hypothesis 7b is not supported.

To elucidate the moderating effect, the completeness of the hospital's data center was divided into two groups based on the mean plus or minus one standard deviation. The relationship between the team collaboration and the data sharing intention was calculated under both high and low levels. Subsequently, a schematic diagram of the moderating effect was drawn, as shown in Figure 4.4. Figure 4.4 indicates that when the level of the completeness of the hospital's data center is low, the slope of the effect of the team collaboration on the data sharing intention is gentle. In contrast, when the level of the completeness of the hospital's data center is high, the slope of the effect of the team collaboration on the data sharing intention is steep, meaning that the influence of the team collaboration on the data sharing intention is stronger.

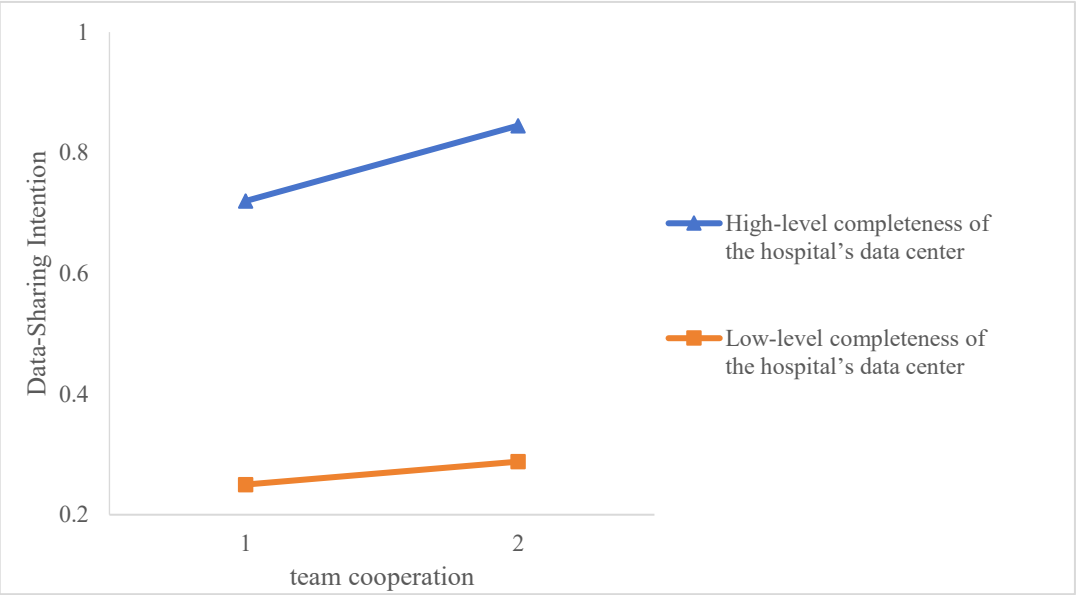


Figure 4.4 Moderating effect of completeness of the hospital's data center for relationship between team collaboration and team data sharing intention

Table 4.14 Moderating effect of hospital data center completeness on team factors

Variable	Data sharing intention				
	Model 1	Model 2	Model 3	Model 4	Model 5
S1 Control Variables					
Age	0.02	-0.03	-0.03	0.02	0.02
Gender	-0.12*	-0.07	-0.07	-0.12*	-0.12*
Education Level	0.06	0.03	0.02	0.06	0.05
Work Experience	0.06	0.11†	0.11	0.06	0.06
S2 Main Effects					
Team collaboration		0.54*	0.52*		
Team Resource Scarcity				0.01	0.01
Hospital Service Culture		-0.14*	-0.14	0.11	0.13
S3 Moderation Effects					
Team collaboration × Data Center Completeness			0.12*		
Team Resource Scarcity × Data Center Completeness					0.001
ΔR^2	0.20	0.26*	0.01*	0.01	0.00
Total R^2	0.20	0.28	0.09	0.21	0.20
Total F	1.48	18.37*	16.80*	0.99	0.85

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

The moderating effect of hospital data center completeness on leader factors

Hypothesis 8 proposes that hospital data center completeness moderates the effect of team leader responsibility (Hypothesis 8a), positive personality (Hypothesis 8b), leader-leader relationship (Hypothesis 8c), and privacy protection awareness (Hypothesis 8d) on team data sharing intention.

The results of the moderating effect test of hospital data center completeness on team leadership personal factors are shown in Table 4.15. The moderating effect of data center

completeness on leadership personal factors is weak, and the interaction term between leader-leader relationship (β=0.10, p<0.1, Model 7) and privacy protection awareness (β=0.09, p<0.1, Model 9) with data center completeness are marginally significant. This suggests that in hospitals with better technological conditions, the positive effect of leadership privacy protection awareness on willingness is slightly stronger, likely because better data management tools reduce privacy risks, encouraging leadership to support sharing. However, the interaction term between responsibility and data center completeness is not significant, indicating that technological facilities have a limited moderating effect on leadership traits. Overall, the impact of organizational technological conditions on leadership factors should be analyzed in specific contexts. The results show that Hypotheses 8a and 8b are not supported, while Hypotheses 8c and 8d are supported.

To elucidate the moderating effect, the completeness of the hospital's data center was divided into two groups based on the mean plus or minus one standard deviation. The relationship between the leader-leader relationship/privacy protection awareness and the data sharing intention was calculated under both high and low levels. Subsequently, a schematic diagram of the moderating effect was drawn, as shown in Figure 4.5/4.6. Figure 4.5/4.6 indicates that when the level of the completeness of the hospital's data center is low, the slope of the effect of the leader-leader relationship/privacy protection awareness on the data sharing intention is gentle. In contrast, when the level of the completeness of the hospital's data center is high, the slope of the effect of the leader-leader relationship/privacy protection awareness on the data sharing intention is steep, meaning that the influence of the leader-leader relationship/privacy protection awareness on the data sharing intention is stronger.

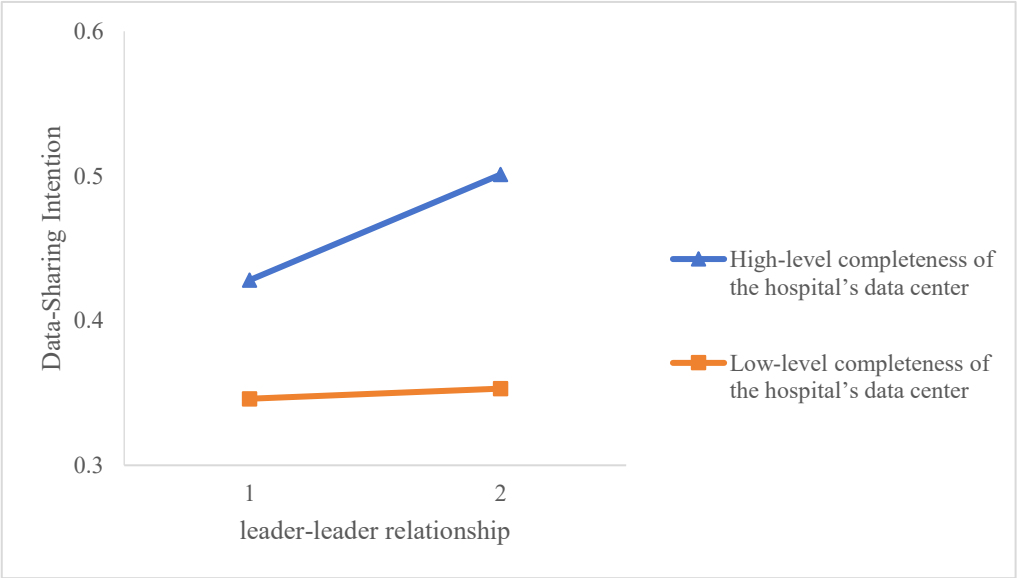


Figure 4.5 Moderating effect of completeness of the hospital's data center for relationship between leader-leader relationship and team data sharing intention

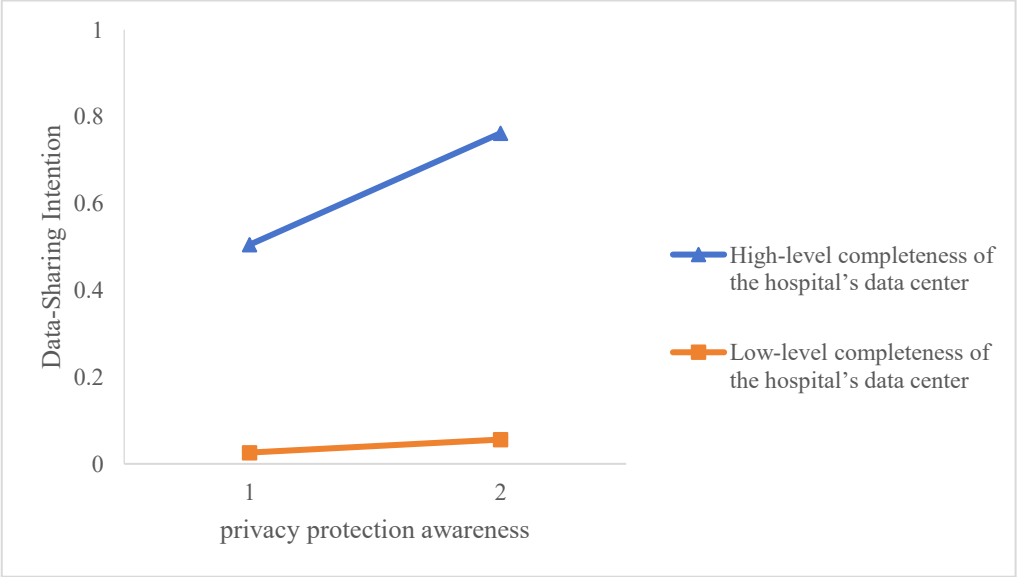


Figure 4.6 Moderating effect of completeness of the hospital's data center for relationship between privacy protection awareness and team data sharing intention

Table 4.15 Moderating effect of hospital data center completeness on leader factors

Variables	Data sharing intention								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
S1 Control Variables									
Age	0.02	-0.03	-0.04	-0.03	-0.04	-0.01	0.002	0.01	0.01
Gender	-0.12	-0.13	-0.13	-0.12	-0.13	-0.07	-0.08	-0.09	-0.10†
Education Level	0.06	0.04	0.06	0.05	0.06	0.04	0.04	0.04	0.04
Work Experience	0.06	0.07	0.04	0.04	0.04	0.08	0.07	0.06	0.06
S2 Main Effects									
Team Leadership Responsibility		0.28	0.27						
Team Leadership Positive Personality				0.27	0.27				
Team Leadership Relationship		-0.04				0.40	0.38		
Team Leadership Privacy Awareness								0.37	0.35
Hospital Service Culture			-0.04	-0.01	-0.01	-0.06	-0.07	-0.05	-0.06
S3 Moderating Effects									
Responsibility × Data Center Completeness			0.03						
Positive Personality × Data Center Completeness					-0.02				
Relationship × Data Center Completeness							0.10†		
Privacy Awareness × Data Center Completeness									0.09†
ΔR^2	0.02	0.07	0.001	0.07	0.00	0.15	0.01†	0.13	0.01†
Total R^2	0.02	0.09	0.10	0.09	0.09	0.17	0.18†	0.15	0.16†
Total F	1.48	4.89	4.22	4.57	3.92	9.45	8.66	8.27	7.53

†p<0.1 *p<0.05, **p<0.01, ***p<0.001

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Chapter 5: Discussion

This chapter presents the empirical findings on how team factors, leadership factors, and organizational factors influence data sharing intention, the relationship between inter-team data sharing intention and behaviors, and the moderating role of organizational factors. It then discusses the theoretical contributions and practical implications. The study acknowledges limitations proposing mitigation strategies. Finally, future research directions are outlined.

5.1 Research findings

This study explores the mechanisms of data sharing among medical administrative teams by constructing a three-level integrated model of "organization-team-leadership". It analyzes the factors affect team data sharing intention of medical administrative teams and the moderating role of organizational factors in this process. Table 5.1 displays the summary of the hypotheses testing.

5.1.1 The impact of team factors on data sharing intention

Inter-team collaboration has a significant positive impact on data sharing intention ($\beta=0.50$, $p<0.05$), indicating that an increase in collaboration enhances the data sharing intention. This finding aligns with social exchange theory, as close collaboration among teams fosters trust and supportive relationships, thereby driving more intense data sharing. However, resource scarcity within teams does not have a significant impact on data sharing intention ($\beta=0.01$, $p>0.05$), possibly because most teams in the sample already have basic resource security, making resource scarcity a non-critical constraint on data sharing.

5.1.2 The impact of team leaders' personal factors on data sharing intention

Team leaders' sense of responsibility ($\beta=0.27$, $p<0.05$), positive personality traits ($\beta=0.27$, $p<0.05$), inter-leadership relationships ($\beta=0.38$, $p<0.05$), and privacy awareness ($\beta=0.36$, $p<0.05$) all have significant positive effects on data sharing intention. Among these, inter-leadership relationships exhibit the strongest explanatory power ($\Delta R^2=0.14$, $p<0.05$), suggesting that effective collaboration between team leaders greatly facilitates a culture of

data sharing. The strong effect of privacy awareness (β=0.36) indicates that when leaders prioritize data security, team members' concerns about sharing decrease, thereby increasing their data sharing intention.

5.1.3 The impact of organizational factors on data sharing intention

Hospital service culture has a significant positive impact on data sharing intention (β=0.16, $p<0.01$), demonstrating that a strong service culture directly enhances the data sharing intention. However, the completeness of the hospital's data center does not have a significant direct impact on data sharing intention (β=0.01, $p>0.05$). This suggests that while technological infrastructure improvements alone do not directly increase data sharing intention, they do play a significant moderating role in the relationship between inter-team collaboration and data sharing intention (interaction term β=0.12, $p<0.05$). This implies that in hospitals with well-developed data centers, the positive effect of inter-team collaboration on data sharing intention is stronger.

5.1.4 The relationship between data sharing intention and behavior

Data sharing intention has a significant positive impact on data sharing behavior (β=0.78, $p<0.001$), explaining 59% of the variance in behavior. This supports the core tenet of the theory of planned behavior, which states that intention is a proximal predictor of behavior. These findings highlight the importance of prioritizing the enhancement of team members' data sharing intention in management, rather than solely relying on external constraints.

5.1.5 The moderating role of organizational factors

Hospital service culture significantly strengthens the impact of inter-team collaboration on data sharing intention (interaction term β=0.11, $p<0.05$) but does not significantly affect the relationship between resource scarcity and data sharing intention. The completeness of the hospital's data center significantly enhances the effect of inter-team collaboration on data sharing intention (interaction term β=0.12, $p<0.05$) but has no significant effect on the impact of resource scarcity. Additionally, the interaction between service culture and privacy awareness is significant (β=0.11, $p<0.05$), indicating that in hospitals with a strong service culture, leaders' privacy awareness has an even stronger positive effect on data sharing intention.

Table 5.1 Summary of testing hypotheses

	Hypotheses	unsupported/supported
H1a	Inter-team collaboration has a positive influence on data sharing intention.	supported
H1b	Resource scarcity has a positive influence on data sharing intention.	unsupported
H2a	Team leader's responsibility has a positive influence on data sharing intention.	supported
H2b	Team leader's positive personality has a positive influence on data sharing intention.	supported
H2c	Leader-leader relationship has a positive influence on data sharing intention.	supported
H2d	Team leader's privacy protect awareness has a positive influence on data sharing intention.	supported
H3a	Organizational service culture has a positive influence on data sharing intention.	supported
H3b	The hospital data center completeness has a positive influence on data sharing intention.	supported
H4	The data sharing intention has a positive influence on data sharing behavior.	supported
H5a	Hospital service culture moderates the relationship between inter-team collaboration and data sharing intention.	supported
H5b	Hospital service culture moderates the relationship between resource scarcity and data sharing intention.	unsupported
H6a	Hospital Service culture moderates the relationship between team leader's responsibility and data sharing intention.	unsupported
H6b	Hospital Service culture moderates the relationship between team leader's positive personality and data sharing intention.	unsupported
H6c	Hospital Service culture moderates the relationship between leader-leader relationship and data sharing intention.	supported
H6d	Hospital Service culture moderates the relationship between team leaders' privacy protect awareness and data sharing intention.	supported
H7a	Hospital data center completeness moderates the relationship between inter-team collaboration and data sharing intention.	supported
H7b	Hospital data center completeness moderates the relationship between resource scarcity and data sharing intention.	unsupported
H8a	Hospital data center completeness moderates the relationship between team leader's responsibility and data sharing intention.	unsupported
H8b	Hospital data center completeness moderates the relationship between team leader's positive personality and data sharing intention.	unsupported
H8c	Hospital data center completeness moderates the relationship between leader-leader relationship and data sharing intention.	supported
H8d	Hospital data center completeness moderates the relationship between team leader's privacy protect awareness and data sharing intention.	supported

5.2 Discussion of findings

5.2.1 The positive impact of inter-team collaboration

(1) Team collaboration as a core factor in promoting data share intention

Enhancing the degree of collaboration among teams significantly strengthens the intention to share data. This finding indicates that team collaboration is a core factor in promoting the intention to share data. In medical administrative teams, close cooperative relationships can establish trust and support, providing the impetus for data sharing. This trust reduces team members' concerns about data leakage and misuse, making them more willing to share data. This relationship can also be explained based on the principle of reciprocity (Park & Gabbard, 2018) and the theory of resource exchange.

In practice, medical institutions can promote collaboration among teams in various ways. For example, regularly organizing cross-team meetings allows members from different teams to exchange progress and experiences, enhancing mutual understanding and trust. Additionally, establishing incentive mechanisms for team collaboration, such as linking team collaboration outcomes to performance assessments, can effectively increase the willingness to collaborate. When team members realize that collaboration can bring mutual benefits, they are more likely to actively participate, thereby promoting data sharing.

(2) The universal promoting effect of team collaboration on data share intention

The significant positive impact of team collaboration on the intention to share data is universal, meaning that this relationship is not limited to specific industries or fields. This also suggests that the social exchange theory is applicable in the field of data sharing (Liu & Zhang, 2020). In the medical industry, enhancing team collaboration significantly increases the intention to share data. This study, based on data from 63 hospitals across the country, found that the significant positive impact of team collaboration on the intention to share data is common among hospitals in different regions. Whether in hospitals in economically developed areas, such as the Fourth People's Hospital of Nanhai District, Foshan City, Guangdong Province, or in hospitals in relatively less developed areas, such as the Second People’s Hospital of Dingxi City, Gansu Province, team collaboration can significantly enhance the intention to share data. This indicates that team collaboration, as an organizational behavior, can transcend geographical and economic differences and become a universally effective means of increasing the intention to share data.

In practice, medical institutions in different regions can promote team collaboration through location-specific approaches. For example, hospitals in economically developed areas can use advanced information technology platforms to establish efficient team collaboration systems, facilitating real-time communication and data sharing across teams. Hospitals in less developed areas, on the other hand, can enhance trust and collaboration among team members through regular offline team-building activities. These location-specific strategies can

effectively improve the level of team collaboration, thereby increasing the intention to share data.

(3) The varying effects of team collaboration on data share intention across different types of hospitals

This study involved a diverse range of hospital types, including general hospitals, maternal and child health hospitals, and traditional Chinese medicine hospitals. The results show that the promoting effect of team collaboration on the intention to share data varies across different types of hospitals. For example, in maternal and child health hospitals and traditional Chinese medicine hospitals, the effect of team collaboration on increasing the intention to share data is more pronounced. This may be related to the professional characteristics of these hospitals, where medical services are more reliant on team collaboration, and data sharing can directly improve the quality of medical services.

In practice, different types of hospitals can develop team collaboration strategies based on their own characteristics. For example, maternal and child health hospitals can establish interdisciplinary joint diagnosis and treatment teams to promote data sharing between different departments and enhance comprehensive diagnostic capabilities. Traditional Chinese medicine hospitals can create TCM diagnosis and treatment collaboration platforms to facilitate experience sharing and data sharing among TCM experts, thereby improving the level of TCM diagnosis and treatment. These targeted strategies can effectively enhance the promoting effect of team collaboration on the intention to share data.

5.2.2 The non-significant impact of team resource scarcity

(1) Basic resource assurance as a prerequisite for data sharing

The impact of team resource scarcity on the intention to share data is not significant. This may be related to the large disparities in basic resource assurance among the teams in the sample. For example, in hospitals located in economically developed areas, such as Nanhai People's Hospital of Guangdong Province, basic resources are relatively abundant, and team members have fewer concerns about data sharing. In contrast, in hospitals in less developed areas, such as Shangcai County People's Hospital in Zhumadian City, Henan Province, although resources are relatively limited, the hospital can still meet the basic needs of team members through rational resource allocation, thereby reducing the negative impact of resource scarcity on the intention to share data. Overall, basic resource assurance is a prerequisite for data sharing. When a team has sufficient resources, resource scarcity is no longer a key factor restricting data sharing.

The hospitals involved in this study are diverse in type, and the results show that the impact of resource scarcity on the intention to share data varies across different types of hospitals. For example, in general hospitals, the impact of resource scarcity on the intention to share data is relatively small, while in maternal and child health hospitals and traditional Chinese medicine hospitals, the impact is more pronounced. This may be related to the professional characteristics and service demands of these hospitals, where the quality of services in maternal and child health hospitals and traditional Chinese medicine hospitals is more dependent on data sharing, and the negative impact of resource scarcity on the intention to share data is more evident.

In practice, medical institutions need to ensure that teams have basic resource assurance, such as sufficient equipment, human resources, and funding. Only when these basic resources are assured will team members be more willing to share data. For example, hospitals can allocate resources rationally to ensure that each team has enough equipment and human resources to complete their tasks. At the same time, hospitals can also optimize resource allocation to improve resource utilization efficiency. Maternal and child health hospitals and traditional Chinese medicine hospitals can obtain more resource support through external collaboration, further reducing the impact of resource scarcity on data sharing.

(2) The contextual impact of resource scarcity on the intention to share data

Although the impact of team resource scarcity on the intention to share data is not significant, this does not mean that resource scarcity is unimportant in all contexts. In certain specific situations, resource scarcity may affect the intention to share data. For example, in extremely resource-scarce conditions, team members may focus more on their own resource needs, thereby reducing their willingness to share data.

Therefore, in practice, medical institutions need to assess the impact of resource scarcity on the intention to share data based on specific contexts. Medical institutions in different regions need to develop reasonable resource assurance strategies according to their own resource conditions. Hospitals in economically developed areas can continue to invest and optimize resource allocation to improve the efficiency and quality of data sharing. Hospitals in less developed areas can meet the basic needs of team members through external collaboration and resource optimization. For example, when a hospital faces financial difficulties, the management needs to take measures to mitigate the impact of resource scarcity on team members, such as obtaining resources through external collaboration or optimizing internal resource allocation. At the same time, medical institutions can also enhance team cohesion by strengthening communication and coordination among team

members, thereby reducing the negative impact of resource scarcity on the intention to share data.

5.2.3 The positive impact of team leader factors

(1) Team leader factors are key factors in enhancing the intention to sharing data

The sense of responsibility, positive personality, inter-leader relationships, and privacy protection awareness of team leaders all have a significant positive impact on the intention to share data. Based on data from 63 hospitals across the country, this study finds that these team leader factors have a significant positive impact on data share intention in hospitals in different regions. Whether in hospitals in economically developed areas, such as the Eighth Affiliated Hospital of Sun Yat-sen University in Guangdong Province, or in hospitals in relatively less developed areas, such as the Maternal and Child Health Hospital in Nanming District, Guiyang City, Guizhou Province, team leader factors can significantly enhance the intention to share data (Li & Wen, 2023). This indicates that team leader factors are key factors in enhancing the intention to share data, transcending geographical and economic differences to become a universally effective means of increasing data share intention. Leaders' sense of responsibility and positive personality can enhance team members' trust, thereby promoting data sharing. Good inter-leader relationships can create a positive team atmosphere, further driving data sharing. Privacy protection awareness can reduce team members' concerns about data security, increasing their willingness to share.

In practice, medical institutions can enhance the intention to share data within teams by selecting and training team leaders with a strong sense of responsibility and positive personality. Medical institutions in different regions can enhance team leader factors in location-specific ways. For example, hospitals in economically developed areas can enhance team leaders' sense of responsibility and positive personality through systematic leadership training programs. Hospitals in less developed areas can enhance trust and collaboration among team leaders through regular team-building activities. At the same time, hospitals can also promote good relationships among leaders by establishing cross-team leadership collaboration mechanisms. In addition, hospitals need to strengthen data security management and enhance team leaders' privacy protection awareness to reduce team members' concerns about data security.

(2) The strongest promoting effect of inter-leader relationships on data sharing intention

Inter-leader relationships have the strongest explanatory power, indicating that good cross-team leadership collaboration can greatly promote a culture of data sharing. This finding

underscores the importance of inter-leader relationships in data sharing, which is consistent with the social exchange theory. Good inter-leader relationships not only promote collaboration among teams but also create a positive team atmosphere, enhancing team members' sense of belonging and identification, thereby driving data sharing.

In practice, medical institutions can promote good relationships among leaders in various ways. For example, regularly organizing cross-team leadership exchange activities can enhance mutual understanding and trust. At the same time, hospitals can also establish incentive mechanisms for inter-leader collaboration to encourage leaders to actively participate in cross-team collaboration. In addition, hospitals need to strengthen communication and coordination among leaders to ensure smooth collaboration among teams, thereby further promoting data sharing.

5.2.4 The positive effect of privacy protection awareness

(1) Privacy protection awareness as a key guarantee for enhancing data sharing intention

The strong effect of privacy protection awareness indicates that when leaders prioritize data security, team members' concerns about sharing data are reduced, and their intention to share data is correspondingly enhanced. Based on data from 63 hospitals across the country, this study finds that the strong effect of privacy protection awareness on data share intention is common among hospitals in different regions. Whether in hospitals in economically developed areas, such as the People's Hospital of Guzhen Town, Zhongshan City, Guangdong Province, or in hospitals in relatively less developed areas, such as the Traditional Chinese Medicine Hospital in Shaoyang City, Hunan Province, privacy protection awareness can significantly enhance the intention to share data. This demonstrates that privacy protection awareness is a key guarantee for enhancing the intention to share data, transcending geographical and economic differences. This result underscores the importance of privacy protection awareness in data sharing (Li & Wen, 2023). In medical administrative teams, data security is one of the primary concerns of team members. When team leaders prioritize data security, team members are more willing to share data.

In practice, medical institutions need to strengthen data security management and enhance the privacy protection awareness of team leaders. Medical institutions in different regions can enhance the privacy protection awareness of team leaders in location-specific ways. For example, hospitals in economically developed areas can establish comprehensive data security management systems to ensure the security and confidentiality of data. Hospitals in less developed areas can enhance the data security awareness of team members through regular

security training. This location-specific strategy can effectively enhance privacy protection awareness, thereby promoting the increase in the intention to share data. In addition, hospitals need to strengthen the supervision of data usage to ensure the legal use of data, thereby reducing team members' concerns about data security.

(2) The long-term promoting effect of privacy protection awareness on data sharing intention

The promoting effect of privacy protection awareness on the intention to share data is long-term. When team leaders continuously focus on data security, team members gradually build trust in data sharing, thereby maintaining a high intention to share data in the long term. This long-term nature provides medical institutions with the opportunity to continuously improve data sharing mechanisms.

In practice, medical institutions need to incorporate privacy protection awareness into team culture construction. For example, hospitals can enhance team members' data security awareness through regular security publicity activities. At the same time, hospitals can also establish data security feedback mechanisms to encourage team members to actively participate in data security management. In addition, hospitals need to continuously optimize data security management systems to ensure the effectiveness of data security measures, thereby promoting the intention to share data in the long term.

5.2.5 The positive impact of hospital service culture

(1) Service culture as a significant organizational factor in enhancing data sharing intention

Hospital service culture has a significant positive impact on the intention to share data. This indicates that service culture is a significant organizational factor in enhancing the intention to share data. Service culture emphasizes customer centricity and focuses on collaboration among teams and service quality. In hospitals with a strong service culture, team members are more willing to share data to improve the quality and efficiency of medical services. This highlights the positive role of contextual factors in data sharing (Fang & Chiu, 2010).

In practice, medical institutions can foster a service culture in various ways. For example, hospitals can establish a customer-centric service philosophy to encourage team members to actively participate in data sharing. At the same time, hospitals can also motivate team members to improve service quality through regular service quality assessments. In addition, hospitals need to strengthen collaboration among teams and create a positive working atmosphere to further promote data sharing.

(2) The indirect promoting effect of service culture on data sharing intention

The promoting effect of service culture on the intention to share data is indirect. Service culture enhances the intention to share data indirectly by strengthening collaboration and trust among teams. This indirectness indicates that the impact of service culture on the intention to share data is realized through enhanced collaboration and trust among teams.

In practice, medical institutions need to enhance collaboration and trust among teams in various ways. For example, hospitals can promote collaboration among teams by establishing cross-team collaboration projects. At the same time, hospitals can also enhance trust among teams by improving communication and coordination among team members. In addition, hospitals need to optimize service processes and improve service quality to further promote data sharing.

5.2.6 The non-significant impact of the hospital data center completeness

(1) The direct impact of technical infrastructure perfection on data sharing intention is limited

The impact of the completeness of a hospital data center on the intention to share data is not significant. This indicates that the direct impact of the perfection of technical infrastructure on the intention to share data is limited. Although the perfection of technical infrastructure can provide technical support for data sharing, its direct impact on the intention to share data is not significant. This may be because in China, most big data technology infrastructures are constructed under the unified planning of the state (Zhang et al., 2020), such as the five national health medical big data regional centers planned and constructed by China Health Medical Big Data Co., Ltd. in Jiangsu, Guizhou, Fujian, Shandong, and Anhui. Under the unified institutional planning, the attention of medical data teams to the perfection of technical infrastructure is not high.

In practice, medical institutions need to recognize that the direct impact of the perfection of technical infrastructure on the intention to share data is limited, and therefore cannot rely solely on technical means to enhance the intention to share data. For example, hospitals can enhance the intention to share data by strengthening collaboration and trust among teams. At the same time, hospitals need to optimize data management processes to improve data utilization efficiency. In addition, hospitals need to strengthen data security management to reduce team members' concerns about data security, thereby further promoting data sharing.

(2) The indirect impact of technical infrastructure perfection on data sharing intention is significant

The completeness of a hospital data center significantly moderates the relationship between team collaboration and the intention to share data. This indicates that the indirect impact of the perfection of technical infrastructure on the intention to share data is significant. In hospitals with more complete data centers, the promoting effect of team collaboration on the intention to share data is stronger.

In practice, medical institutions need to enhance the promoting effect of team collaboration on the intention to share data by improving technical infrastructure. For example, hospitals can upgrade data center equipment to enhance data processing and analysis capabilities. At the same time, hospitals can optimize data management systems to improve the convenience and efficiency of data sharing. In addition, hospitals need to strengthen the training of technical personnel to ensure the effective operation of technical infrastructure, thereby further promoting data sharing.

(3) The indirect impact of technical infrastructure perfection on data sharing intention is realized through team collaboration

The indirect impact of the completeness of a hospital data center on the intention to share data is mainly realized through enhanced team collaboration. In an environment with a complete data center, team members can more efficiently access and process data, thereby enhancing the willingness to collaborate among teams. This enhanced willingness to collaborate further promotes the increase in the intention to share data. For example, a complete data center can provide more powerful data analysis tools and more convenient data sharing platforms, making it easier for team members to access and use data during collaboration, thereby reducing barriers to data sharing.

In practice, medical institutions can enhance team collaboration by optimizing the functions of the data center and providing more powerful data processing and analysis tools. For example, hospitals can introduce advanced data analysis software to help team members better understand and utilize data. At the same time, hospitals can establish data sharing platforms to simplify the process of data access and sharing, thereby further promoting team collaboration and data sharing.

(4) The indirect impact of technical infrastructure perfection on data share intention is realized through improved data quality

The indirect impact of the completeness of a hospital data center on the intention to share data is also reflected in the improvement of data quality. A complete data center can ensure the accuracy and completeness of data, thereby enhancing team members' trust in data. When team members are confident in the quality of data, they are more willing to share data. For

example, a complete data center can use data cleaning and validation tools to ensure the accuracy and consistency of data, reducing data errors and redundancy.

In practice, medical institutions can improve data quality by strengthening the data quality management functions of the data center. For example, hospitals can establish data quality monitoring systems to regularly check the accuracy and completeness of data. At the same time, hospitals can implement data governance processes to ensure data quality during data collection, storage, and usage. In addition, hospitals can provide data quality training to enhance team members' awareness of data quality, thereby further promoting the intention to share data.

5.2.7 The positive impact of share data intention on share behavior

(1) Data sharing intention as a significant predictor of data sharing behavior

The intention to share data has a significant positive impact on data sharing behavior, accounting for 59% of the variance in behavior. This indicates that the intention to share data is a significant predictor of data sharing behavior. When team members have a high intention to share data, they are more likely to actually share data.

In practice, medical institutions need to enhance the intention to share data among team members through various means. For example, hospitals can strengthen collaboration and trust among teams to enhance team members' sense of belonging (Erden et al., 2012), thereby increasing the intention to share data. At the same time, hospitals need to optimize data management processes to improve data utilization efficiency. Additionally, hospitals need to strengthen data security management to reduce team members’ concerns about data security, thereby further promoting data sharing behavior.

(2) The stability of the promoting effect of data sharing intention on data sharing behavior

The promoting effect of the intention to share data on data sharing behavior is stable. When team members have a high intention to share data, they will consistently share data. This stability provides medical institutions with the opportunity to continuously improve data sharing mechanisms.

In practice, medical institutions need to maintain the intention to share data among team members through various means. For example, hospitals can establish incentive mechanisms for data sharing to encourage team members to continue sharing data. At the same time, hospitals need to conduct regular assessments of data sharing to understand team members' needs and feedback. Additionally, hospitals need to continuously optimize data management

processes to ensure the effectiveness of data sharing, thereby promoting data sharing behavior in the long term.

(3) The promoting effect of data sharing intention on data sharing behavior can be enhanced by incentive mechanisms

The promoting effect of the intention to share data on data sharing behavior can be further enhanced by incentive mechanisms. In practice, medical institutions can establish incentive mechanisms, such as reward systems and performance assessments, to encourage team members to translate their intention to share data into actual behavior. For example, hospitals can set up data sharing rewards, offering material rewards or career development opportunities to team members who actively participate in data sharing. Such incentive mechanisms can effectively enhance team members' data sharing behavior, translating intention into action.

In practice, medical institutions can establish incentive mechanisms in various ways. For example, hospitals can set up a data sharing reward fund to provide cash rewards to outstanding team members. At the same time, hospitals can incorporate data sharing behavior into the performance assessment system of team members through performance evaluations, thereby further promoting the implementation of data sharing behavior.

(4) The promoting effect of data sharing intention on data sharing behavior can be enhanced by training and education

The promoting effect of the intention to share data on data sharing behavior can also be further enhanced by training and education. Medical institutions can enhance team members' data sharing skills and awareness through regular data sharing training and educational activities. For example, hospitals can organize data sharing workshops to teach team members how to effectively share data and how to use data to improve service quality. Such training and educational activities can help team members better translate their intention to share data into actual behavior.

In practice, medical institutions can conduct training and educational activities in various ways. For example, hospitals can provide training content related to data sharing through online courses and offline seminars. At the same time, hospitals can help team members better understand and apply data sharing skills through case analysis and experience sharing. Additionally, hospitals can establish data sharing communities to encourage communication and learning among team members, thereby further promoting the implementation of data sharing behavior.

5.2.8 The moderating role of hospital service culture

(1) Service culture enhances the impact of team collaboration on data sharing intention

Hospital service culture significantly enhances the impact of team collaboration on the intention to share data. Based on data from 63 hospitals across the country, the study finds that the moderating role of service culture on data share intention is common among hospitals in different regions. Whether in hospitals in economically developed areas, such as the Third Township Hospital in Zhongshan City, Guangdong Province, or in hospitals in relatively less developed areas, such as the Traditional Chinese Medicine Hospital in Ziyang County, Ankang City, Shaanxi Province, service culture can significantly enhance the impact of team collaboration on the intention to share data. In hospitals with a strong service culture, the promoting effect of team collaboration on the intention to share data is stronger. This also highlights the positive role of contextual factors in data sharing.

In practice, medical institutions need to enhance the impact of team collaboration on the intention to share data by fostering a service culture. For example, hospitals can establish a customer-centric service philosophy to encourage team members to actively participate in data sharing. At the same time, hospitals can motivate team members to improve service quality through regular service quality assessments. In addition, hospitals need to strengthen collaboration among teams and create a positive working atmosphere to further promote data sharing.

(2) The moderating role of service culture on the relationship between privacy protection awareness and data sharing intention

The interaction term between service culture and privacy protection awareness is significant, indicating that in hospitals with a strong service culture, leaders' privacy protection awareness has a stronger positive effect on the intention to share data. This indicates the moderating role of service culture on the relationship between privacy protection awareness and data share intention. In hospitals with a strong service culture, the promoting effect of privacy protection awareness on the intention to share data is stronger.

In practice, medical institutions need to enhance the impact of privacy protection awareness on the intention to share data by fostering a service culture. For example, hospitals can establish comprehensive data security management systems to ensure the security and confidentiality of data. At the same time, hospitals can enhance team members' data security awareness through regular security training. In addition, hospitals need to strengthen the

supervision of data usage to ensure the legal use of data, thereby reducing team members' concerns about data security.

(3) Service culture enhances the impact of team leader responsibility on data sharing intention

Service culture significantly enhances the impact of team leader responsibility on the intention to share data. In hospitals with a strong service culture, the promoting effect of team leader responsibility on the intention to share data is stronger. This is because service culture emphasizes customer centricity and focuses on collaboration among teams and service quality. When team leaders have a strong sense of responsibility, they are more willing to encourage team members to actively participate in data sharing, thereby enhancing the intention to share data.

In practice, medical institutions can enhance the impact of team leader responsibility on the intention to share data by fostering a service culture. For example, hospitals can establish leadership responsibility assessment mechanisms to regularly evaluate team leaders' sense of responsibility and leadership abilities. At the same time, hospitals can enhance team leaders' responsibility awareness and leadership skills through training and educational activities. In addition, hospitals can establish team collaboration projects to encourage team leaders to actively participate in team collaboration, thereby further promoting the increase in the intention to share data.

(4) Service culture enhances the impact of team leader positive personality on data sharing intention

Service culture significantly enhances the impact of team leader positive personality on the intention to share data. In hospitals with a strong service culture, the promoting effect of team leader positive personality on the intention to share data is stronger. This is because leaders with a positive personality can create a positive working atmosphere, enhance team members' sense of trust and belonging, and thereby promote the increase in the intention to share data.

In practice, medical institutions can enhance the impact of team leader positive personality on the intention to share data by fostering a service culture. For example, hospitals can establish leadership training programs to enhance team leaders' positive personality traits. At the same time, hospitals can enhance trust and collaboration among team members through regular team-building activities. In addition, hospitals can establish incentive mechanisms to encourage team leaders to actively participate in team collaboration, thereby further promoting the increase in the intention to share data.

5.2.9 The moderating role of the hospital data center completeness

(1) The perfection of technical infrastructure can enhance the impact of team collaboration on data sharing intention

The completeness of a hospital data center significantly enhances the impact of team collaboration on the intention to share data. Whether in hospitals in economically developed areas or in hospitals in relatively less developed areas, the perfection of technical infrastructure can significantly enhance the impact of team collaboration on the intention to share data. This indicates that the perfection of technical infrastructure can enhance the impact of team collaboration on the intention to share data. This is consistent with the research conclusions of Zhang et al. (2017). In the context of this study, in hospitals with more complete data centers, the promoting effect of team collaboration on the intention to share data is stronger.

In practice, medical institutions need to enhance the impact of team collaboration on the intention to share data by improving technical infrastructure. For example, hospitals can upgrade data center equipment to enhance data processing and analysis capabilities. At the same time, hospitals can optimize data management systems to improve the convenience and efficiency of data sharing. In addition, hospitals need to strengthen the training of technical personnel to ensure the effective operation of technical infrastructure, thereby further promoting data sharing.

(2) The moderating role of technical infrastructure perfection on the relationship between inter-leader relationships and data sharing intention

The completeness of a hospital data center significantly enhances the impact of inter-leader relationships on the intention to share data. This indicates the moderating role of the perfection of technical infrastructure on the relationship between inter-leader relationships and data share intention. In hospitals with more complete data centers, the promoting effect of inter-leader relationships on the intention to share data is stronger.

In practice, medical institutions need to enhance the impact of inter-leader relationships on the intention to share data by improving technical infrastructure. For example, hospitals can establish cross-team leadership collaboration platforms to promote communication and exchange among leaders. At the same time, hospitals can optimize data management processes to improve the convenience and efficiency of data sharing. In addition, hospitals need to strengthen the training of technical personnel to ensure the effective operation of technical infrastructure, thereby further promoting data sharing.

(3) The perfection of technical infrastructure can enhance the impact of team leader privacy protection awareness on data sharing intention

The completeness of a hospital data center can significantly enhance the impact of team leader privacy protection awareness on the intention to share data. In an environment with a complete data center, the promoting effect of team leader privacy protection awareness on the intention to share data is stronger. This is because a complete data center can provide more powerful data security measures, reducing team members' concerns about data security, thereby enhancing the intention to share data.

In practice, medical institutions can enhance the impact of team leader privacy protection awareness on the intention to share data by improving technical infrastructure. For example, hospitals can establish data security management systems to ensure the security and confidentiality of data. At the same time, hospitals can enhance team leaders' privacy protection awareness through regular security training. In addition, hospitals can establish data security feedback mechanisms to encourage team members to actively participate in data security management, thereby further promoting the increase in the intention to share data.

(4) The perfection of technical infrastructure can enhance the impact of team resource scarcity on data sharing intention

The completeness of a hospital data center can significantly enhance the impact of team resource scarcity on the intention to share data. In an environment with a complete data center, the negative impact of team resource scarcity on the intention to share data is reduced. This is because a complete data center can provide more powerful data processing and analysis capabilities, enabling team members to efficiently utilize data even with limited resources, thereby reducing the negative impact of resource scarcity on the intention to share data.

In practice, medical institutions can enhance the impact of team resource scarcity on the intention to share data by improving technical infrastructure. For example, hospitals can optimize the functions of the data center to provide more powerful data processing and analysis tools, helping team members to better utilize data with limited resources. At the same time, hospitals can establish resource optimization mechanisms to allocate data resources reasonably, ensuring that team members can obtain sufficient data support. In addition, hospitals can establish data sharing platforms to simplify the process of data access and sharing, thereby further promoting the increase in the intention to share data.

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Chapter 6: Conclusions and Future Research

This chapter discusses the theoretical and practical significance of the study and addresses the limitations encountered during the research process, such as deficiencies in sample selection and research methods, and offers corresponding suggestions for improvement. Finally, it provides an outlook for future research.

6.1 Conclusion

This study focuses on the inter-team data sharing mechanism in healthcare and constructs an integrated three-level model of "Organization-Team-Leadership". It explores the key factors influencing the willingness and behavior of medical administrative teams to share data, as well as their underlying mechanisms. Through empirical research, the study reveals that inter-team collaboration, team leadership traits, hospital service culture, and data center completeness significantly impact data sharing intention. It also examines the interactions among these factors and their effects on data sharing behavior.

The results indicate that inter-team collaboration has a significant positive impact on data sharing intention, suggesting that close collaboration fosters trust and support, thus motivating data sharing. However, team resource scarcity does not have a significant effect, possibly because most teams in the sample already have basic resource security. Additionally, leadership responsibility, positive personality traits, inter-leadership relationships, and privacy awareness all significantly and positively affect data sharing intention. Among these, inter-leadership relationships have the strongest explanatory power, indicating that strong collaboration among leaders greatly promotes a culture of data sharing. The strong effect of privacy awareness suggests that when leaders prioritize data security, team members' concerns about sharing decrease, thereby increasing their willingness to share.

At the organizational level, hospital service culture has a significant positive impact on data sharing intention, indicating that a strong service culture directly enhances data sharing intention. However, the direct effect of hospital data center completeness on data sharing intention is not significant. Nonetheless, it plays a significant moderating role in the relationship between inter-team collaboration and data sharing intention, implying that in hospitals with well-developed data centers, team collaboration has a stronger positive effect

on data sharing intention. Furthermore, data sharing intention has a significant positive impact on data sharing behavior, explaining 59% of the variance in behavior. This supports the core premise of the Theory of Planned Behavior—that intention is a proximal predictor of behavior.

In summary, this research provides a multilevel perspective on inter-team data sharing in healthcare. It clarifies the moderating roles of organizational culture and technology infrastructure, offers actionable insights for improving collaboration, leadership, and data infrastructure in healthcare settings.

6.2 Research implication

6.2.1 Theoretical contribution

This study focuses on health and healthcare data sharing, shifting from a broad, macro-level policy perspective to the micro-level of implementation. By constructing an integrated three-tier model—"organization-team-leadership"—this research provides a new theoretical framework for understanding data sharing mechanisms among medical administrative teams. The findings enrich the application of social exchange theory, social capital theory, and planned behavior theory in the field of healthcare data sharing, uncovering the multi-level factors influencing data sharing intention. The theoretical significance lies in two aspects: first, it offers a practical theoretical framework for healthcare data sharing, and second, it deepens the understanding of the theories related to data sharing intention in the healthcare domain.

(1) Expanding the perspective of healthcare data sharing research

This study focuses on the micro-level mechanisms of data sharing among medical administrative teams, breaking away from previous research that mainly examined institutional and systemic aspects at the macro level. By constructing the "organization-team-leadership" model, this research delves into the practical execution of data sharing, providing a new theoretical framework. This model not only considers organizational, team, and individual factors but also introduces moderating variables, systematically analyzing their interactions and their impact on data sharing intention.

(2) Enhancing the application of social exchange and social capital theories

Using social exchange theory and social capital theory as foundations, this study explores how inter-team collaboration and leadership traits influence data sharing intention. The

findings confirm that collaboration between teams significantly enhances trust and support, reinforcing the core idea of social exchange theory—collaboration and resource sharing. Additionally, leadership qualities such as responsibility, positive personality traits, and privacy awareness have a significant positive impact on data sharing intention, broadening the application of social capital theory in organizational behavior. These findings highlight the critical role of individual social capital in fostering a data sharing culture.

(3) Deepening the application of planned behavior theory in healthcare

Through empirical analysis, this study validates the applicability of planned behavior theory in healthcare data sharing. The results show that data sharing intention has a significant positive impact on actual data sharing behavior, explaining 59% of the variance in behavior. This supports the core premise of planned behavior theory—that intention is a key predictor of behavior. This discovery not only strengthens the application of planned behavior theory in the medical field but also provides new empirical evidence for understanding the relationship between behavioral intention and actual actions, further extending the research boundaries of planned behavior theory in healthcare data management.

(4) Revealing the moderating role of organizational culture and technological infrastructure

The study identifies the moderating roles of hospital service culture and data center completeness in the data sharing mechanisms among medical administrative teams. Findings suggest that a strong service culture significantly enhances the effect of inter-team collaboration on data sharing intention, while a well-developed data center facilitates collaboration by reducing integration difficulties. This finding enriches the application of organizational culture theory in healthcare data sharing and provides a fresh perspective on the role of technological infrastructure in organizational behavior, illustrating how both organizational culture and technology jointly influence data sharing intention and behavior.

(5) Providing a theoretical basis for interdisciplinary research

The study of medical administrative team data sharing mechanisms spans multiple disciplines, including management, psychology, sociology, and information science. By integrating theories and methods from these disciplines, this research establishes an interdisciplinary framework that lays the groundwork for future studies. For example, the incorporation of psychological theories (such as social exchange theory and planned behavior theory) alongside information science concepts (such as data center completeness) supports a multifaceted analysis of data sharing mechanisms, fostering the development of interdisciplinary research.

6.2.2 Managerial implication

This study provides concrete guidance for healthcare institutions on data sharing management, helping address key operational challenges. Its practical significance lies in promoting real-world applications of healthcare data sharing and advancing medical big data utilization.

(1) Strengthening team collaboration and data sharing culture

The study finds that inter-team collaboration has a significant positive impact on data sharing intention. In hospital management, establishing cross-team collaboration mechanisms and offering teamwork training can enhance communication and collaboration, thereby increasing data sharing intention and behavior. Additionally, the positive influence of hospital service culture suggests that fostering an organizational culture supportive of data sharing is essential. By advocating values such as teamwork and knowledge sharing, hospitals can strengthen members' recognition of and motivation for data sharing, cultivating a strong data sharing culture.

(2) Enhancing leadership and management effectiveness

The study confirms that leadership qualities—such as responsibility, positive personality traits, inter-leadership relationships, and privacy awareness—significantly influence data sharing intention. Hospitals should focus on selecting and developing team leaders with these qualities to foster a culture of data sharing. Strong cross-team leadership collaboration can greatly enhance data sharing practices. Hospitals can implement leadership training programs and establish leadership communication mechanisms to improve management effectiveness and encourage data sharing behavior.

(3) Optimizing hospital data center development

Although the completeness of a hospital's data center does not directly impact data sharing intention, it plays a moderating role in the relationship between team collaboration and data sharing intention. A well-developed data center strengthens the positive impact of collaboration. Hospitals should increase investment in data centers, improving data storage, management, and accessibility to provide technical support for data sharing. A comprehensive data center simplifies sharing processes, enhances data security, and reinforces trust in data sharing practices.

(4) Improving medical service quality and research capabilities

Sharing data among medical administrative teams enables hospitals to gain a more comprehensive understanding of patients' medical histories, medication use, and treatment

outcomes, leading to more accurate diagnoses and treatment decisions. Additionally, rich healthcare data provides valuable resources for scientific research, helping hospitals advance their research capabilities. By promoting data sharing among medical administrative teams, hospitals can better integrate medical resources, improve service quality, and enhance research outcomes, ultimately providing higher-quality healthcare for patients.

(5) Driving medical informatization and digital transformation

In the era of "Internet + Healthcare," medical informatization and digital transformation are inevitable trends. This study's exploration of data sharing mechanisms among medical administrative teams offers both theoretical and practical guidance for hospitals advancing these initiatives. By optimizing data center development, strengthening collaboration and leadership, and fostering a supportive data sharing culture, hospitals can enhance information interoperability and accelerate the digital transformation process, ultimately boosting their competitive edge.

6.3 Research limitation

Although this study has achieved certain theoretical and practical contributions, it still has some limitations, mainly in the following aspects:

(1) Sample limitations

The sample in this study was obtained in healthcare institutions from a specific region, predominantly consisted of secondary hospitals in Shenzhen, with limited sample size and scope. This may restrict the generalizability of the findings, making them less representative of different regions and various types of healthcare institutions in China. Future research should expand the sample scope to include different regions and types of healthcare institutions, such as general hospitals, specialized hospitals, and primary healthcare institutions, to enhance the universality and representativeness of the results.

(2) Limitations in variable measurement

Some variables in this study may have subjective measurement biases. For example, the measurement of variables such as team resource scarcity and team leadership responsibility mainly relies on questionnaire surveys, which may be influenced by respondents subjective perceptions. Additionally, there is no standardized framework or detailed quantitative indicators for assessing hospital data center completeness, which may lead to measurement inaccuracies. Future research should further refine variable measurement methods, reduce subjective biases, and improve the accuracy and reliability of measurement results.

(3) Complexity of moderating effects

When analyzing the moderating effects of organizational factors, it was found that the interaction between hospital service culture and team resource scarcity was not significant. This could be attributed to sample characteristics, measurement methods, or other factors. Furthermore, the moderating effect of hospital data center completeness on the relationship between team leadership traits and data sharing intention was relatively weak. This suggests that the moderating role of organizational factors may be influenced by multiple variables, requiring further exploration. Future studies could apply multi-level analytical methods to examine the interactions between different levels of factors and uncover the complex moderating mechanisms of organizational factors in inter-team data sharing processes.

(4) Lack of consideration for external environmental factors

This study primarily focuses on the influence of organizational, team, and leadership factors on medical administrative team data sharing intention, without fully considering external environmental factors such as policies, regulations, and market competition. In real-world healthcare settings, these external factors may have a significant impact on data sharing intention and behavior. Future research should incorporate external environmental factors and analyze their role in inter-team data sharing mechanisms, providing more comprehensive theoretical insights and practical guidance for healthcare institutions.

6.4 Future research

To address the limitations of this study, future research can improve and expand upon the following aspects:

(1) Expanding the sample scope

Future studies should include healthcare institutions from different regions and of different types (such as general hospitals, specialized hospitals, and primary healthcare institutions) to enhance the universality and representativeness of the findings. Additionally, employing a multi-stage sampling method can ensure sample diversity and improve the external validity of the research results.

(2) Optimizing variable measurement methods

Efforts should be made to reduce subjective perception biases in variable measurement. For example, team resource scarcity can be quantified using objective data, such as resource utilization rates and resource gaps. The completeness of hospital data centers should be assessed using standardized quantitative criteria covering multiple dimensions, including data

storage, management, and security, to enhance measurement accuracy and reliability. Moreover, incorporating multiple measurement tools and methods, such as in-depth interviews and case studies, can enrich data sources and improve the study's validity and reliability.

(3) Exploring the moderating mechanisms of organizational factors

Future research should delve deeper into how organizational factors moderate data sharing mechanisms within teams. Multi-level analysis methods can be employed to explore the interactions between different levels of factors and reveal the complex moderating roles of organizational elements. Additionally, other moderating variables (such as team size and team stability) could be introduced to examine their impact on data sharing intention and behavior, providing more comprehensive management recommendations for healthcare institutions.

(4) Considering external environmental factors

Future studies should incorporate the influence of external factors on inter-team data sharing mechanisms, such as how changes in policies and regulations affect healthcare institutions' data sharing intention and how market competition drives data sharing initiatives. By comprehensively analyzing internal and external factors, a more complete model of inter-team data sharing in healthcare can be developed, offering both theoretical and practical guidance.

(5) Investigating the dynamic process of data sharing

Future research can explore the dynamic nature of data sharing behavior, examining how it evolves over time and identifying key factors that influence these changes. This could help healthcare institutions develop dynamic data management strategies. Time-series analysis and other analytical techniques could be employed to study the changing patterns of data sharing behavior and uncover underlying mechanisms.

(6) Conducting interdisciplinary research

Given that data sharing mechanisms in medical administrative teams involve multiple disciplines, future studies can adopt an interdisciplinary approach by integrating theories and methods from psychology, sociology, and information science. This would allow for a more comprehensive examination of the factors and mechanisms influencing data sharing, providing better theoretical support and practical guidance for addressing healthcare data sharing challenges. Interdisciplinary research could also broaden perspectives, enrich study content, and enhance research depth and breadth.

Building on this study, future research can explore the following new directions and questions:

(1) Incentive mechanisms for data sharing

While this study found that team leadership responsibility and positive personality traits significantly impact data sharing intention, it did not explore the role of incentive mechanisms in depth. Future research could analyze the effects of different incentive mechanisms (such as financial incentives and psychological incentives) on data sharing behavior and identify effective strategies for fostering a data sharing culture.

(2) Privacy protection technologies for data sharing

As data sharing practices expand, concerns over data privacy protection are becoming increasingly important. Future research could focus on privacy protection technologies, such as block-chain and encryption techniques, and examine how to promote data sharing while ensuring security. This would provide technological solutions and support for healthcare institutions.

(3) Cross-regional collaboration in data sharing

This study mainly focuses on data sharing within healthcare institutions. Future research could extend to cross-regional collaboration between healthcare institutions, analyzing mechanisms, challenges, and solutions for sharing data across different regions. This would provide theoretical and practical insights for establishing nationwide or even global healthcare data sharing frameworks.

(4) Ethical issues in data sharing

Data sharing involves not only technical and managerial challenges but also ethical concerns. Future research could explore ethical issues such as data ownership, data usage rights, and fairness in data sharing. Examining how to balance stakeholder interests and ensure ethical and legal compliance in data sharing practices would contribute to the sustainable development of healthcare data sharing.

(5) Policy and regulatory frameworks for data sharing

While this study focuses on micro-level data sharing mechanisms within teams, future research could investigate the role of policies and regulations in facilitating data sharing. Studies could explore how policy guidance and regulatory frameworks can promote data sharing practices and support the development of healthcare big data applications. Research in this area would provide valuable theoretical and practical insights for governments and related institutions to formulate effective data sharing policies.

In summary, to advance healthcare data sharing practices, future research should focus on balancing data security and privacy protection while promoting responsible and ethical data sharing practices. Given the unique characteristics of healthcare data in different regions, it is

crucial to establish a comprehensive data sharing framework. Although healthcare data sharing has received broad support from governments and funding programs, challenges related to data ownership and industry support remain. Overcoming these obstacles requires collaboration among governments, scientists, patients, and the broader public.

With continued support from governments and healthcare institutions, healthcare data sharing will face new opportunities for development. Advances in science and technology will further enable multi-party data sharing, leading to enhanced healthcare outcomes and improved patient care.

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