Risk Identification and Collaborative Governance of the OMO Model for Shared Caregivers in Medical Public Welfare

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Abstract: Against the backdrop of the deepening population aging process and the advancement of the "Healthy China 2030" strategy, the OMO (Online-Merge-Offline) model involving shared caregivers in medical public welfare has emerged as an important pathway to alleviate the imbalance between the supply and demand of caregiving resources and to innovate medical public welfare services. This model integrates compassionate caregiver resources through online platforms while coordinating offline medical institutions and communities to provide caregiving services. By combining characteristics of the sharing economy, medical public welfare, and online–offline integration, it is capable of activating idle caregiving resources in society to a certain extent, thereby reducing family caregiving pressure and the burden on public healthcare systems. However, in practical implementation, this model faces multiple risks, including personnel qualifications, service quality, operational management, technological data security, and legal compliance, which constrain its sustainable development. Based on the practice of the "Shared Care Alliance" project, this study adopts literature review and risk matrix analysis methods to identify the major risk categories of the OMO model of shared caregivers in medical public welfare, analyze the underlying causes of these risks, and construct a prevention and control framework characterized by "pre-event prevention—mid-event control—post-event guarantee—full-process optimization." Specific strategies are proposed, including improving caregiver access and training mechanisms, promoting service standardization, strengthening multi-party collaboration, enhancing data security protection, and improving legal compliance systems. These strategies can reduce the probability of risk occurrence, improve the operational stability of the model, and provide references for the standardized development of medical public welfare OMO models.

Keywords: Shared Caregivers; Medical Public Welfare; OMO Model; Risk Identification; Prevention and Control Strategies

1. Introduction

China is experiencing an accelerating aging process, with a continuously expanding population of older adults, particularly those who are advanced in age, disabled, or semi-disabled. Accordingly, the demand for long-term care and medical nursing services has been growing rapidly. Traditional medical public welfare services are characterized by fragmented resource allocation, information asymmetry, low service efficiency, and insufficient professional capacity, making it difficult to meet the diversified care needs of the population. The OMO model, as a service form integrating online and offline systems, has already been applied in the healthcare sector. By leveraging digital technologies, it helps break temporal and spatial constraints and facilitates the integration of resources as well as the matching of supply and demand. The OMO model of shared caregivers participating in medical public welfare is built around volunteer caregivers as the main service providers and adopts a "service-for-service" incentive mechanism. It establishes a coordinated system combining online platforms and offline service sites, providing public welfare services such as rehabilitation care, daily living assistance, and psychological support for older adults, patients with chronic diseases, and disadvantaged groups. This approach contributes, to a certain extent, to optimizing the allocation of medical public welfare resources and improving the level of social mutual assistance.

In recent years, the development of digital health

technologies has provided new possibilities for innovation in care service models. Studies have shown that digital tools can improve caregivers' experiences, enhance service efficiency, and, to some extent, alleviate imbalances in resource distribution [1]. With the widespread adoption of online platforms, remote health management tools, and intelligent matching systems, integrated online–offline service models have gradually become an important direction in healthcare service development. This model integrates online information services with offline care resources, driving structural changes in the organization, resource allocation, and service processes of care delivery. At the policy level, China has also actively promoted the development of "Internet + Healthcare," which has laid an institutional foundation for the formalization and standardization of digital care services [2].

Family caregiving continues to play an important role in the long-term care system. With the acceleration of population aging, an increasing number of younger family members are involved in caring for older relatives, facing significant challenges in terms of emotional stress, time commitment, and role conflict [3]. Family caregivers generally bear a relatively heavy physical and psychological burden, and the insufficient supply of professional care resources further intensifies this tension [4].Against the backdrop of constrained care resources, community-based care and volunteer services have gradually become important forces in filling service gaps. Existing studies suggest that community care ecosystems can improve service accessibility for vulnerable groups, while volunteer participation mechanisms also provide additional support to the care service system [5].

In the field of risk research on elderly care services, scholars have conducted systematic analyses of risk structures from a supply chain perspective. Relevant studies, based on the dimensions of supply chain actors, have identified risk factors related to policy, supply, management, and trust among multiple stakeholders, including governments, integrators, service providers, and older adults, and have proposed corresponding governance suggestions [6]. However, such studies have primarily focused on traditional elderly care service systems, with insufficient attention to digitally enabled public welfare care models involving multi-stakeholder participation.

With the widespread and increasingly intensive application of digital technologies in care services, caregiving service platforms have gradually generated new types of risks during their development and operation. Existing studies indicate that long-term care systems generally face structural problems such as caregiver shortages, high turnover, and insufficient training, all of which directly affect platform stability and service continuity [7].At the occupational level, caregivers commonly experience risks related to job instability, burnout, and high turnover rates, further intensifying human resource pressures within platforms [8]. Under high-stress working conditions, caregivers are also prone to physical and psychological burdens, which may negatively affect service quality and safety [9].At the platform operation level, studies suggest that long-term care institutions often encounter challenges such as excessive workload, inefficient personnel scheduling, weak management practices, and heavy regulatory requirements. These factors collectively undermine the stability and sustainability of the service system [10].

Existing studies have examined issues such as family caregiving burden, digital health technologies, community-based care mechanisms, and risks within elderly care service supply chains from multiple perspectives, and have provided certain theoretical and practical insights. However, in the specific context of the "shared caregiver–medical public welfare–OMO model," the risk structure has not yet been systematically and comprehensively analyzed. Within digitally driven public welfare care models, the interaction among multiple stakeholders, the coordination mechanisms between online and offline service processes, as well as the linkage between volunteer service incentive mechanisms and platform governance, have often been studied in a fragmented manner, without being examined in an integrated way. Against this background, this study takes the "Shared Care Alliance" project as a case example to identify the risks associated with shared caregivers participating in the medical public welfare OMO model, and further analyzes them from a structural perspective. On this basis, possible pathways for collaborative governance are further discussed. The findings of this study help to view the risks of such service models from a holistic perspective, and

also provide theoretical support and practical reference for the digitalization, professionalization, and sustainable development of medical public welfare services.

2. Risk Identification

The primary risks associated with the OMO model of shared caregivers in medical public welfare are reflected in personnel risks, service risks, operational risks, and legal compliance risks, as detailed below.

2.1 Analysis of Four Types of Risks

Personnel-related risks constitute the most fundamental source of uncertainty in the OMO model of shared caregivers in medical public welfare. These risks arise primarily from the heterogeneous composition of caregivers, many of whom enter the system without formal professional certification or systematic training. In practice, this leads to an uneven baseline of caregiving capability, and in some cases, non-standard operational behaviors that may introduce avoidable safety concerns. What makes this category particularly critical is not only the variability of individual competence, but also the instability embedded in participation patterns. Since a large proportion of caregivers engage in service activities on a voluntary basis, their availability is often shaped by external and unpredictable factors such as employment arrangements or family obligations. Service discontinuity, therefore, does not occur as an exception but rather as a recurring operational condition in certain contexts. At the same time, incentive structures remain relatively weak. Although the "service-for-service" mechanism provides a basic motivational framework, its practical effectiveness varies significantly across participants. This inconsistency often translates into differences in engagement intensity, which indirectly affects the continuity and reliability of service provision.

Service-related risks tend to emerge gradually from the accumulation of personnel-level variability. Once differences in caregiver capability are translated into actual service delivery, inconsistencies in service quality become difficult to avoid. In the absence of unified operational standards, service processes tend to diverge, resulting in highly uneven user experiences across different service instances. More importantly, platform-side support for service matching remains insufficient in practice. The gap between data availability and real-world decision-making requirements means that matching between caregivers and service recipients is often based on incomplete or partially updated information. As a result, mismatches between service capability and care demand may occur, particularly in cases involving complex or rapidly changing health conditions. Offline service environments further amplify this uncertainty. Unlike standardized institutional settings, home-based or community-based care situations often involve unpredictable conditions. When sudden health deterioration or emergency events occur, caregivers may face limitations in response capacity. In such situations, the absence of clearly institutionalized emergency coordination with medical institutions becomes a practical constraint rather than a theoretical risk.

Operational risks are more structural in nature, reflecting the internal tension of the OMO governance model itself. While the model relies on the integration of online coordination systems and offline service execution, this integration is not always stable in practice. Data synchronization delays, fragmented information flow, and weak process alignment frequently appear at the interface between platform operations and field implementation. These gaps lead to a form of "soft fragmentation" in service delivery, where continuity is maintained at a formal level but weakened at the operational level. One direct consequence is the reduced traceability of service processes, particularly when full lifecycle data recording is not consistently implemented. Without sufficient traceability, the system's ability to identify and correct deviations in a timely manner is inevitably constrained. Feedback mechanisms also remain underdeveloped. Although bidirectional evaluation is theoretically embedded in the model, its actual effectiveness is often limited by participation bias and incomplete information input. This weakens the system's capacity for self-correction and continuous optimization. In addition, financial transparency and resource allocation processes introduce another layer of operational uncertainty. Given the dependence on sustained external funding and the limited revenue-generating capacity of public welfare services, any imbalance between operational costs and funding stability may gradually translate into long-term sustainability pressure.

Legal and compliance risks are primarily shaped by institutional gaps rather than operational failures alone. In many cases, the absence of clearly standardized enforcement mechanisms regarding caregiver qualification recognition and platform registration creates a gray area in regulatory practice. When service-related incidents occur, responsibility attribution among caregivers, platform operators, and cooperating medical institutions is often not clearly defined in advance. This ambiguity does not necessarily manifest in daily operations, but becomes highly sensitive once disputes arise. The difficulty lies less in identifying fault and more in structuring accountability pathways that are widely accepted by all parties involved.

The "service-for-service" mechanism introduces additional complexity. While it functions as a key incentive device, the lack of standardized rules for recording, verifying, and exchanging service hours increases the possibility of irregular behaviors. These issues, although not always visible at the surface level, can gradually erode the credibility of the system if left unregulated. Finally, compliance with public welfare governance requirements, particularly those related to fund and resource management under the Charity Law, requires a higher level of procedural transparency. However, achieving consistent compliance in practice remains operationally demanding, especially in decentralized service environments.

2.2 Risk Matrix Analysis

To more intuitively determine the priority of each risk, this study uses a risk matrix that cross-analyzes risk likelihood (high, medium, low) and severity (high, medium, low). Based on the four categories of risks, personnel risks include professional competence risks, personnel turnover risks, and service willingness risks; service risks include service standardization risks, supply–demand matching risks, and emergency response risks; operational risks include online–offline disconnection risks, supervision risks, and cost control risks; legal compliance risks include qualification compliance risks, responsibility allocation risks, and public welfare compliance risks. The detailed risk matrix is shown in Table 1.

According to the matrix, professional competence risk, service standardization risk, and supervision risk are Level 1 risks—high likelihood and high severity—and should be prioritized. Personnel turnover, emergency response, and qualification compliance risks are Level 2 and require close attention. Service willingness, cost control, and public welfare compliance risks are Level 3 and may be deprioritized when resources are limited.

Table 1. Risk Matrix Classification of the OMO Model for Shared Caregivers in Medical Public Welfare

Risk Category	Specific Risk	Likelihood	Severity	Risk Level
Personnel Risk	Professional competence risk	High	High	Level 1
Personnel Risk	Personnel turnover risk	High	Medium	Level 2
Personnel Risk	Service willingness risk	Medium	Medium	Level 3
Service Risk	Service standardization risk	High	High	Level 1
Service Risk	Supply–demand matching risk	Medium	Medium	Level 2
Service Risk	Emergency response risk	Medium	High	Level 2
Operational Risk	Online–offline disconnection risk	Medium	Medium	Level 2
Operational Risk	Supervision risk	High	High	Level 1
Operational Risk	Cost control risk	Medium	Medium	Level 3
Legal Compliance Risk	Qualification compliance risk	Medium	High	Level 2
Legal Compliance Risk	Responsibility allocation risk	Low	High	Level 2
Legal Compliance Risk	Public welfare compliance risk	Low	Medium	Level 3

3. Analysis of Risk

The formation of risks in the OMO model of shared caregivers participating in medical public welfare is the result of the interaction of multiple structural and operational factors. These factors can be analyzed from five dimensions: institutional, organizational, managerial, technological and financial, as well as incentive and protection mechanisms.

At the institutional level, the regulatory framework specifically targeting shared caregivers and medical public welfare OMO models remains underdeveloped. There is a lack of unified standards governing caregiver qualification verification, service procedures,

supervision mechanisms, responsibility allocation, and public welfare time-exchange systems. As a result, the industry operates in a relatively fragmented and unregulated environment, where risk prevention lacks a solid institutional foundation. At the organizational level, the operation of this model involves multiple stakeholders, including government agencies, medical institutions, platform operators, caregivers, patients, and public welfare organizations. However, the boundaries of responsibilities among these actors are often ambiguous, leading to the absence of effective communication and coordination mechanisms. In practice, this frequently results in mutual shirking of responsibilities when problems arise. Moreover, insufficient professional support from medical institutions, limited regulatory engagement from government authorities, and inadequate management capacity of platform operators further intensify operational uncertainties and risk accumulation. At the managerial level, a common issue lies in the disproportionate emphasis on model construction over risk governance. Comprehensive risk management systems covering identification, assessment, response, and monitoring have not been fully established. Key processes such as caregiver recruitment, training, evaluation, supervision, and incentive design remain loosely managed. In addition, the lack of standardized service procedures and insufficient transparency in the management of funds and materials contribute to the accumulation of latent risks. At the technological and financial levels, the public welfare nature of the model imposes inherent constraints on funding availability. Limited financial resources restrict investment in platform development, system maintenance, and technological innovation. Consequently, many platforms rely on low-code systems, which may compromise system stability, functionality, and scalability. Furthermore, data security protection measures are often inadequate, with insufficient implementation of encryption, backup, and access control mechanisms, thereby increasing the risk of data breaches and system vulnerabilities. At the level of incentives and protection mechanisms, the model is primarily based on voluntary participation, with relatively simple and limited incentive structures. The mismatch between caregivers' labor input and received rewards reduces participation motivation and long-term engagement. At the same time, the absence of comprehensive occupational liability insurance and personal safety protection mechanisms weakens the protection of caregivers' legitimate rights and interests, further exacerbating issues such as personnel turnover and service instability.

4. Risk Prevention and Control Strategies

4.1 Strengthening Personnel Risk Control through Core Capacity Building

Effective control of personnel-related risks requires the establishment of a robust foundation centered on the standardization and stabilization of the core service workforce. A hierarchical access mechanism for caregivers should be developed, categorizing participants into three levels: basic volunteers, professional caregivers, and senior medical personnel. Professional caregivers should be required to provide valid nursing qualification certificates and health documentation, while a dual verification mechanism combining online identity authentication and offline background checks should be implemented to prevent unqualified individuals from entering the platform at the source. A comprehensive training system integrating theoretical instruction, practical skills, and emergency response capabilities should be established. Training content should encompass basic nursing care, rehabilitation support, psychological counseling, service etiquette, legal and regulatory knowledge, and emergency handling procedures. A rigorous assessment mechanism should be introduced, whereby only individuals who successfully pass evaluations are permitted to provide services, while those who fail are required to undergo retraining before re-entry. From an incentive perspective, the "service-for-service" mechanism should be further optimized to enhance participation motivation. Public welfare service hours may be converted on a one-to-one basis into caregiving services for oneself or family members, products from partner enterprises, or public welfare training programs. Transferability to immediate family members should also be supported. For student participants, service engagement may be linked to academic credit recognition. Furthermore, the provision of volunteer liability insurance and personal accident insurance is essential to safeguard caregivers' legitimate rights and interests. These measures not only

enhance participation willingness but also contribute to reducing personnel turnover and improving overall service stability.

4.2 Enhancing Service Risk Control through Quality Standardization

The mitigation of service-related risks fundamentally depends on the establishment of a standardized and quality-oriented public welfare service system. A unified Medical Public Welfare Care Service Specification should be formulated to clearly define service scope, operational procedures, quality benchmarks, and prohibited practices. The implementation of a service checklist system can further ensure that caregivers deliver services in strict accordance with established standards, thereby promoting consistency and reliability in service provision. To improve the efficiency and accuracy of resource allocation, advanced data analytics and artificial intelligence technologies should be leveraged to enable intelligent matching. By comprehensively integrating information such as caregivers' skill levels, geographic locations, availability, and patients' medical conditions, care needs, and service locations, precise supply–demand alignment can be achieved. In addition, an emergency dispatch mechanism should be established to ensure that substitute caregivers can be rapidly assigned in cases of temporary absence, thereby maintaining service continuity. A full-process supervision framework combining "online monitoring, offline inspection, and bidirectional evaluation" should also be implemented. Caregivers should record service activities through platform-based check-in systems, task completion logs, and digital documentation, ensuring traceability throughout the service process. Service recipients should be enabled to provide real-time feedback, while platforms should conduct regular follow-up evaluations. Based on these data, caregiver credit profiles can be established, enabling differentiated management, including recognition and incentives for high-performing caregivers and timely removal of underperforming individuals. Such mechanisms contribute to continuous improvement in service quality and user satisfaction.

4.3 Regulating Operational Risk through Systematic Management Optimization

The effective control of operational risks requires the standardization and integration of the entire service process. It is essential to eliminate data silos between online platforms and offline service stations by establishing an integrated information system that enables real-time synchronization of service demands, caregiver status, and service records. This facilitates the construction of a closed-loop operational system encompassing online reservation, task allocation, training, and supervision, as well as offline service delivery, guidance, and emergency response, thereby eliminating coordination gaps. To ensure transparent and accountable operation, a dedicated supervision unit should be established to conduct continuous oversight of service processes, financial flows, and material utilization. The proactive disclosure of public welfare fund usage and service performance data can enhance transparency and strengthen social trust. At the same time, refined budget management practices should be implemented to control operational costs effectively, while diversified funding channels—including corporate sponsorships and public welfare investment initiatives—should be actively explored to enhance financial sustainability. Furthermore, strengthening collaboration among multiple stakeholders is critical for improving operational resilience. Government agencies should provide policy guidance and regulatory oversight, medical institutions should offer professional training, technical support, and emergency response capabilities, while community organizations should be responsible for demand identification and local coordination. Through the integration of these roles, a collaborative governance framework characterized by "government regulation, institutional support, platform operation, and social participation" can be established.

4.4 Strengthening Technological and Data Risk Control through Digital Security Assurance

Data security represents a critical dimension of risk management in the OMO model. The adoption of stable and reliable platform systems, combined with regular system updates and vulnerability remediation, is essential to ensure system security and operational continuity. At the same time, user interface design should be optimized to reduce complexity, while supplementary support mechanisms such as customer service assistance and offline service

facilitation should be introduced to address the digital divide, particularly among elderly users, thereby improving accessibility and inclusiveness. Strict compliance with relevant legal frameworks, including the Personal Information Protection Law and the Data Security Law, is necessary to ensure lawful data management. Technical measures such as data encryption, hierarchical access control, and regular data backup should be implemented to establish a robust data protection system. Clear regulations governing data usage must be enforced to prevent unauthorized disclosure, tampering, or misuse of user information. Regular data security audits should also be conducted to identify and mitigate potential vulnerabilities. In addition, contingency plans for system failures should be developed to ensure service continuity under unexpected conditions. In cases of platform malfunction or system outages, alternative mechanisms such as offline registration and telephone-based appointment systems should be activated immediately to maintain uninterrupted service delivery and minimize the impact of technological disruptions.

4.5 Ensuring Legal Compliance through Institutional Safeguards

The prevention and control of legal and compliance risks require adherence to regulatory principles governing medical services, public welfare activities, and volunteer services. A comprehensive platform compliance manual should be developed to clearly define the rights and obligations of all participating parties, ensure proper platform registration, and standardize all service procedures to guarantee lawful operation. When establishing service agreements, particularly tripartite contracts involving caregivers, platform operators, and medical institutions, responsibilities and liabilities must be explicitly defined to prevent ambiguity in dispute resolution. A dedicated dispute mediation mechanism and complaint handling channel should be established to address service conflicts efficiently and protect the legitimate rights and interests of both caregivers and service recipients. The "service-for-service" time-exchange mechanism should be regulated through detailed operational guidelines, including standardized procedures for recording, auditing, and public disclosure of service hours and points. Strict verification processes should be implemented to prevent fraudulent practices such as falsified service records or improper exchanges. Meanwhile, the management of public welfare funds and materials must strictly comply with the requirements of the Charity Law, ensuring transparency, accountability, and the exclusive use of resources for public welfare purposes, thereby safeguarding the integrity of the initiative.

5. Conclusion and Prospects

5.1 Research Conclusions

The OMO model of shared caregivers participating in medical public welfare represents an innovative approach to addressing the challenges posed by population aging and optimizing the allocation of healthcare and caregiving resources. By integrating online platforms with offline service delivery, this model has demonstrated potential in enhancing resource utilization efficiency and expanding access to public welfare services. However, its practical implementation is accompanied by a series of structural and operational risks, primarily encompassing personnel risks, service risks, operational risks, technological and data risks, as well as legal and compliance risks. The analysis indicates that the emergence of these risks can be attributed to multiple underlying factors, including the absence of comprehensive industry regulations, insufficient coordination among stakeholders, inadequacies in management systems, limited technological support, and deficiencies in incentive and protection mechanisms. These factors collectively contribute to the complexity and uncertainty of risk generation within the model.

In response to these challenges, this study proposes a full-process risk prevention and control framework characterized by "pre-event prevention, mid-event control, post-event assurance, and continuous optimization." Through the implementation of five key strategies—namely, strengthening personnel access and training systems, promoting service standardization, improving operational governance, enhancing technological and data security, and reinforcing legal compliance mechanisms—the likelihood of risk occurrence can be effectively reduced, and the stability of model operation can be significantly improved. These strategies are developed with

consideration of the public welfare nature of the model while maintaining practical feasibility and long-term sustainability. As such, they provide valuable references for the standardized and regulated development of the “shared caregivers + medical public welfare” OMO model.

5.2 Future Prospects

Future research may further advance the development of this model in several directions. First, more refined quantitative approaches to risk assessment can be introduced to construct scientifically grounded evaluation index systems, thereby improving the precision of risk identification and prioritization. Second, the integration of emerging technologies such as block chain and artificial intelligence may enhance the efficiency and accuracy of risk monitoring and early warning mechanisms. And continued efforts are required to promote the improvement of industry standards and legal frameworks, facilitating the establishment of a coordinated governance system involving government regulation, market mechanisms, and social participation. Meanwhile, the ongoing optimization of the “service-for-service” incentive mechanism remains essential to expanding participation and improving service sustainability. By broadening service coverage and enhancing operational efficiency, the OMO model of shared caregivers in medical public welfare can better serve elderly populations and disadvantaged groups, thereby contributing to the advancement of the “Healthy China” initiative and the high-quality development of public welfare services.

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