The Way of Logistics Innovation in Chinese Hospitals

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Abstract: The medical service in China now cannot satisfy people’s daily requirements very well. The huge working pressures, low efficiency and high cost have become serious, especially in large hospitals. Many hospitals introduced modern logistics technology and developed information system. However, the service level cannot be improved effectively. To propose some solutions and fill the gap in this filed, we analyze the present condition, and obtained the main factors that can hinder the development of operation level in Chinese hospitals are the great number of patients, unvalued logistics and the backward logistics management. Besides, due to the information technology and logistics system have not been combined organically, it is hard to improve the operation level globally. Based on the analysis, we present the way of innovation in Chinese hospital. Firstly, hospitals should optimize the logistics operation from the perspective of overall operation and implement the integrative management. Secondly, hospitals should implement the organic combination between information technology and logistics system. Thirdly, to promote the operation level in Chinese hospitals, it is important to train professional logistics managers. Finally, hospitals should apply some professional third parties when purchasing the modern logistics technical equipment.

Key Words: Hospital logistics, Materials handling, Logistics, Innovation, China

1. Introduction

The medical service in China now cannot satisfy people’s daily requirements very well. The problem, such as huge working pressures, low efficiency and high cost has become serious, especially in large hospitals. In order to improve the working efficiency and service level, many hospitals in China introduced digital information system and achieved some results. For example, the use of medical cards and electronic medical records has simplified the process of medical service, improved the efficiency of medical workers and eased the patients’ burden.

However, Chinese hospitals’ digital operation has not significantly improve the service level. Problems just like huge working pressures, low efficiency and high cost are still serious. When it comes to the reason why these problems take place in China, besides the unreasonable design of information system, the backward logistics management is an important factor that hinders the promotion of service level. In addition, the fact that the information system and logistics system have not been combined organically also makes digital operation only stay on the level of information. Hospitals’ operation cannot get effective support from logistics system. As a result, the promotion of operation level is held back seriously.

In fact, recognizing the existence of these problems, some hospitals in China have introduced modern logistics technology to improve the operating level. However, the effect is not very well. In China, hundreds of hospitals have introduced medical air-operated material distribution transmission system. Few of them succeeded in this field, quite a number of air-operated systems are in a state of broken or disabled (He and Ma, 2012) [7].

For the above failures, one can explain that Chinese hospitals do not have enough experience in the application of logistics technology. However, the reason may be more complicated. Due to the specificity of medical services, hospital logistics must require highly in safety, accuracy and timeliness. Otherwise, it will threaten patients’ lives. Furthermore, hospital logistics in China is very complicated. In a hospital, especially in a large hospital in China, there are many hospital departments, many patients and families, many kinds of drugs, many specimens, many data and files, many instruments and equipment, which lead to the extremely mess. The extremely mess in Chinese hospitals makes it easy to understand the complexity. Under this complex condition, the high operation cost is, of course, inevitable.

In fact, Chinese hospitals do have little theoretical support and practical experience in the application and integration of logistics technology. Due to the wide variety of mechanic, semi-automatic and automatic equipment in modern logistics technology, it is very difficult for Chinese hospitals to make a right decision. At present, lacking quantitative and theoretical basis, many decisions are mainly according to other hospitals’ application. As a result, the investments achieved little effect or even result in a failure. Some hospitals adopted modern logistics technology in some fields, but technologies in different fields cannot coordinate very well. Therefore, the performance of overall logistics system cannot be improved effectively. From the perspective of overall operation, modern logistics technology’s application and integration are essential and important.

To improve the service level of Chinese hospitals, most of the
related literature consider from macroscopic aspects, and seldom involved in micro-specific solutions. Some scholars focus on applying information technology in hospitals to realize digital operation. However, they ignore hospital logistics. Some research on the application of logistics technology consider the optimization and improvement locally, unfortunately, but not globally. From the existing research, we cannot find the solution about how to improve the hospital logistics in China effectively and efficiently. To the best of our knowledge, there is no literature focusing on such problems. In this paper, after reviewing the related literature and analyzing the problems, we point out the way of logistics innovation in Chinese hospital.

The rest of the paper is organized as follows. We present a literature review in Section 2. Section 3 analyses the main problems existed in Chinese hospital logistics. Section 4 points out the way of innovation in Chinese hospital. In Section 5, we conclude our findings in this study and also present suggestions for future research.

2. Literature Review

Although the hospital logistics is very important to the development of modern logistics, research on this field is backward in China. To improve the service level of Chinese hospitals, hospital logistics and digital operation are considered as two important ways. Unfortunately, until now, scholars have not provided an efficient and effective solution for Chinese hospitals. The following is a review of the related literature.

Some scholars analyze the existing problems in Chinese hospital logistics and propose some related countermeasures. Most of these studies are from macroscopic aspects, and seldom involve in micro-specific solutions. Deng (2006) [2] analyzes the hospital logistics management in developed countries, and points out that Chinese hospital logistics management exists some development obstacles, such as the excess inventories and the backward organization. After that he provides two effective methods to solve the problem, i.e., the innovation of Chinese hospital logistics organization, and the application of adopting suitable logistics and supply chain management measures. Liang (2008) [11] points out the problems in the operations of Chinese hospitals, i.e., unclear management goal of hospital logistics, unspecific management system and backward information management, etc. Liang (2010) [12] proposes that hospitals should grasp the developing trend of logistics from many aspects, for instance, the layout, the application of logistics technology and logistics information, and logistics process reengineering, etc. He also points out that the advanced logistics technology is the only approach to improve the low efficiency of Chinese hospital. Zhuang (2012) [17] mentions that effective hospital logistics management can reduce the cost and improve medical service level. Liu (2012) [13] compares Chinese hospital logistics with foreign countries. He states that the logistics management system is not comprehensive in China, and the functions in logistics chain (procurement, storage, waste disposal, etc.) are backward.

Some scholars research on the application of information technology and digital operation. However, few of them consider hospital logistics, simultaneously. Sun (2013) [15] points out that digital hospitals in China have not overall planning. As a result, information in different departments is difficult to share with each other. Leng (2013) [10] builds up hospital management decision support information system, by which the cost is decreased and the efficiency is increased. He (2014) [6] makes information management in Chinese hospitals more efficient through data mining. Tong (2014) [16] optimizes medical process by smart phone APP. It can improve the long queues problem in hospitals. Dou (2015) builds up mobile nursing information system, basing on personal digital assistant (PDA), nurses can share data between inside and outside of the operating room. They can use it to deal with information data at any time.

Some research on the application of logistics technology consider the optimization and improvement locally but not globally. Zhou (2007) [18] proposes to connect hundreds of working points (nurse stations, emergency rooms, operating rooms, etc.) together through pipelines. Using the power of airflow can implement point-to-point transportation of medicines, medical records and specimens. Sha (2013) [14] states the usage of rail logistics system in Ningxia people’s hospital. He points out that the system not only saves time, space and human resources, but also promotes the running efficiency and service quality. He and Ma (2012) [7] compare the intelligentunicar transmission logistics system with the air-operated material distribution transmission system in terms of weight, transport efficiency and stability. They think that the use of such a system will contribute to the long-term development in Chinese hospitals. Guan (2010) [5] studies the application of bar code in hospitals. He states that bar code can improve the efficiency of data identification and input in hospital management. M. Ferretti (2014) [3] studies the improvement of hospital logistics with Italian public medical institutions as an example. M. Ferretti points out that the automation of drug management can reduce the cost and improve the service quality. P.H.P. Fung Kon Jin (2011) [8] points out that the use of logistics system simulation modeling methods can improve the ability of hospital logistics. Viviane (1997) [4] analyzes and improves hospital delivery system. He provides the performance measurements of distribution system.

3. Problems analysis

At present, Chinese hospitals have various problems. Comparing with foreign hospitals, the biggest problem is the large number of patients, which results in an extremely mess. However, most of the hospitals in China devote to promoting the medical level but not logistics. Therefore, during the development of Chinese hospitals, they often ignore the importance of logistics. Recently, many hospitals attach importance to information construction for a higher medical service level. Unfortunately, the backward hospital logistics system greatly reduced the achievement of the information construction.

3.1 The plenty of patients, especially in large hospitals

Due to the large population in China, the great number of patients is inevitable. At present, hospitals cannot satisfy the demand very well. On the other hand, medical resources are quite unbalanced in China. High-level experts and equipment often concentrate on large hospitals. With the development of transportation, it is more and more convenient for patients to go to these hospitals in order to get a better medical service. As a result, there has been a sharp increase in the number of patients in such hospitals. More and more patients of course lead to
more and more staffs, medical records, drugs, instruments and equipment, etc. Since cannot satisfy the demand, hospitals have to enlarge the scale. Therefore, the mess in hospitals become much more serious. How to improve the internal mess in hospitals is a problem urgently need to be solved. Besides, the large amount of patients make most of the advanced logistics experience in foreign countries cannot achieve much progress in China.

3.2 Not value logistics, and inexperienced in this field
Generally, hospitals only attach importance to the promotion of medical level but not the logistics operation. Some hospitals even think that logistics has nothing to do with the operation. In addition, hospitals in China have very few professional managers that major in logistics. Besides, lots of hospitals still have not set up a separated logistic department, which makes it difficult to improve the operation level or to apply modern logistics technical equipment. Unfortunately, hospitals that intend to enlarge the scale also think little of logistics during the expanding. Therefore, they have left many potential problems for the further development. On the other hand, although some rebuilding hospitals consider the application of modern logistics technical equipment, they are almost inexperienced in this field. As a result, it is very difficult for them to make a choice from the wide variety of mechanic, semi-automatic and automatic logistics equipment.

3.3 Backward logistics management
At present, the hospital logistics management in China is backward. There are no specialized staff in charge of the comprehensive service for patients. As a result, the operation of hospitals cannot get effectively support from logistics system. Many activities in hospitals are complicated, such as the registration, medical examination and payments, etc., need a long time to queue up. During meal-times, patients or their families have to go out to buy food by themselves. Under this condition, the great number of people in Chinese hospitals will lead to the internal mess more and more seriously. For instance, patients need to buy food themselves during the meal-times in some hospitals, which can lead to the mess in vertical traffic, especially for elevators (see Fig.1). If considering all of the logistics activities, one can imagine the complexity in hospitals. In addition, the backward management may lead to the problems such as the unreasonable inventory, the shortage of talents. Therefore, the improvement of logistics management can not only reduce the mess, but also achieved a higher service level effectively in hospitals.

3.4 Information system and logistics system cannot be combined organically
Recently, many Chinese hospitals value the application of information technology but not logistics operation. As a result, the promotion of operation level in hospitals is not satisfied. Here we take the process of picking medicine as an example. When doctors prescribe drugs and patients finish the payments, the related information can be delivered to pharmacy immediately. Since the information system and logistics system have not been combined organically, it is quite inefficient in pharmacy because most of the works there only rely on manpower. Then patients need to wait for a long time and have to crowd outside of pharmacy (see Fig.2& 3), which results in a seriously mess and a higher cost on manpower. Generally, the efficiency of operation and service level cannot be promoted effectively only through the electronization of information. Modern logistics technology, such as the picking system, automated sorting system etc., has not been widely used to implement the effective operation. There are many similar examples in Chinese hospitals. Therefore, although the informatization level is higher in some hospitals, if they think little of logistics operation, it will be difficult to improve the operation level globally.

4. The way of logistics innovation in Chinese hospital
With the above analysis, this section will provide the way of logistics innovation in Chinese hospitals. First, hospitals should optimize the logistics operation from the perspective of overall operation and implement the integrative management. In general, hospitals can and should establish specialized systems and departments to provide comprehensive service for patients. For instance, from the viewpoint of logistics, when solving the previous problem of having meals, hospitals can take the following measure. Using an on-line ordering system and implement uniform distribution, through which patients can place an order without going outside of their wards during the meal-times.
Then the specialized staffs will deliver the meals according to the orders (see Fig. 4). As a result, the internal mess in hospitals can be improved significantly, and the service level will be promoted. Thus, hospitals can adopt similar methods or ideas to solve other different logistics problems. With the integrative and effective management, the service level in hospitals will be promoted distinctly.

In addition, on the premise of overall planning, it is essential to consider the organic combination between logistics system and information system. For instance, when referring to the problem proposed before, we point out the following view. During the process of picking medicine, although the related information can be delivered quickly, most hospitals still do not take full advantage of it. And the works in pharmacy mainly rely on manpower. In order to improve the efficiency and service level, hospitals can bring in modern logistics technologies, such as the automated sorting system, picking system, etc. With the application of such system, works in pharmacy can be done orderly and automatically, patients no longer need to wait a long time for the medicine. Such technologies can be introduced into many other fields in Chinese hospitals to improve the operating level and greatly reduce the cost caused by manpower. Thus, it is important to value the promotion of logistics, and promote the organic combination between logistics system and information system.

Thirdly, the shortage of professional logistics managers hinders the promotion of operations level in Chinese hospitals. Thus, hospitals should train more talents to improve the level of professionalism in hospital logistics. Besides, to support the overall operation, the investment of modern logistics technical equipment is essentially. In general, when hospitals purchase modern logistics technical equipment, most of the logistics planning are designed by manufacturers. However, some manufacturers only stand on the purpose of sales and benefits, but seldom consider the adaptability of the planning and equipment to hospitals. As a result, although these equipment can solve some problems, it is difficult to implement global optimization for a whole hospital. For instance, some Chinese hospitals introduced air-operated material distribution transmission system to improve its service level and efficiency, but cannot support the overall operation in their hospitals. Therefore, such systems are inefficient and hardly meet the demand of hospitals. With the above analysis, we intend to recommend the following point. When choosing modern medical equipment, hospitals can apply some professional third parties to make the overall planning (see Fig. 5 & 6). Through this way, hospitals can obtain more adapted overall planning and the corresponding equipment, and accelerate the promotion of operations level. In addition, some unnecessary loss can be avoided.

5. Conclusion
In this paper, we obtained the following factors that can hinder the development of operation level in Chinese hospitals. First,
the great number of patients can result in an extremely mess, especially in large hospitals. Such mess increase the pressure on hospitals and reduce the efficiency. In addition, hospitals do not value logistics very much, and there are few professional logistics managers. As a result, it is difficult for hospitals to make an adapted choice from various medical equipment. Furthermore, the backward logistics management can result in a more seriously mess. Besides, due to the information technology and logistics system have not been combined organically, it is hard to improve the operation level globally.

Based on the analysis, we present the way of innovation in Chinese hospital. Firstly, hospitals should optimize the logistics operation from the perspective of overall operation and implement the integrative management, providing comprehensive service for patients. This is an effective way to improve the internal mess in hospitals. Secondly, implement the organic combination between information technology and logistics system. This can improve the operation level and reduce the manpower cost. Thirdly, to promote the operation level in Chinese hospitals, it is important to train professional logistics managers. Finally, hospitals should apply some professional third parties when purchasing the modern logistics technical equipment. For future work, we may analyze the specific logistics solutions for a hospital in China to improve its service level.

References

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