ISCTE Business School
Instituto Universitário de Lisboa

An Empirical Study of Patient-Centered Hospital Clinical Process: Dimensions, Antecedents and Outcomes

Xu Xin

Thesis submitted as partial requirement for the conferral of the degree of

Doctor of Management

Supervisor:

Professor Elsa Cardoso, ISCTE Lisbon University Institute

Co-supervisor:

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January, 2016

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Declaration

I declare that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university and that to the best of my knowledge it does not contain any material previously published or written by another person except where due reference is made in the text.

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Abstract

Differing from disease-center or physician-centered clinical practice, patient-centered practice emphasizes patients' individual differences, patient participation in clinical decision-making, physician-patient communication, and patient experience and satisfaction in the treatment process. Focusing on the patient-centered practice in Chinese hospitals, this study aims to answer three research questions: What constitutes a patient-centered clinical process? How do different patient-centered clinical process dimensions affect patient-based outcomes? What are the antecedents that determine the different patient-centered clinical process dimensions? A variety of qualitative and quantitative research methods were used, including literature analysis, case study, factor analysis, and linear regression analysis.

In our study, patient-centered clinical processes defined as a clinical process that contributes to a cooperative partnership between healthcare personnel, patients and their families, to ensure that clinical decisions can respect the patient's needs, ideas and wishes, and that the patients are entitled to have access to education and support needed in decision making, prompting patients to participate in clinical processes, so that they get a better perceived value and service experience. The core of patient-centered clinical process is the interactive and collaborative partnership of physicians, nurses, and patients, which can be expressed as a number of patient-perceived dimensions, including diagnosis and treatment, nursing, communication, management and information.

This study theoretically added insights on the definition and core dimensions of the patient-centered clinical process, the relationship between different dimensions and the patient outcome, especially within the context of a unique health system in China. These findings and conclusions could be useful for management practice in Chinese hospitals. However, these implications may be limited due to the small data collection sample and cross-sectional study design.

Keywords: patient centeredness; clinical process; evaluation; information technology

JEL Classification System: I110, M14

Resumo

Ao contrário da prática clínica centrada na doença ou no médico, a prática clínica focada no paciente enfatiza as diferenças individuais dos pacientes, a sua participação na tomada de decisão clínica, a comunicação entre médico-paciente, e a experiência e a satisfação do pacienteno processo de tratamento. Este estudo centra-se na prática clínica focada em pacientes em hospitais Chineses, procurando responder a três perguntas de investigação: O que constitui um processo clínico focado no paciente (PCCP)? De que forma as dimensões do PCCP influenciam os resultados em termos do paciente? Quais os antecedentes que determinam as diferentes dimensões do PCCP? Neste estudo foram usados métodos de investigação qualitativos e quantitativos, incluindo análise de literatura, caso de estudo, análise fatorial e regressão linear.

Neste estudo, o PCCP é definido como um processo clínico que contribui para uma parceria cooperativa entre os profissionais de saúde, pacientes e as suas famílias, assegurando que as decisões clínicas respeitam as necessidades, ideias e desejos do paciente, e que os pacientes têm direito a ter acesso à educação e suporte necessários para a tomada de decisão. A participação dos pacientes no processo clínico deve ser promovida, de forma a assegurar uma melhor experiência de serviço e valor percecionado pelos pacientes. O centro do PCCP é de facto a parceria interativa e colaborativa entre médicos, enfermeiros e pacientes, que pode ser expressa por um conjunto de dimensões percecionadas pelos pacientes, tais como diagnóstico e tratamento, enfermagem, comunicação, gestão e informação.

Este estudo contribui com conhecimento teórico acerca da definição e das dimensões chave de um processo clínico focado no paciente, e das relações existentes entre as diferentes dimensões e os resultados para o paciente, particularmente no contexto de um único sistema de saúde na China. Os resultados e conclusões deste estudo podem ser úteis para a prática de gestão nos hospitais Chineses. Contudo, estas implicações estão limitadas devido à reduzida dimensão da amostra de dados e ao desenho do estudo transversal.

Palavras-chave: foco no paciente; processo clínico; avaliação; tecnologias de informação

Sistema de Classificação JEL: I110, M14

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Although I have worked in the hospital management leadership positions for several years, and accumulated some practical experience, I still feel obscured by the lack of theoretical knowledge and research with respect to hospital management. Thanks to Southern Medical University and ISCTE Lisbon University Institute, I have such a good learning platform. Many well-known Chinese and foreign professors teach a lot of valuable knowledge on management theories and research methods, which are of great help to my daily hospital management.

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Chapter 1: Introduction

1.1 Research background and motivation

1.1.1 Evolution of hospital clinical process

Man's struggle with diseases lasts for several thousands of years. At any rate, the prosperity of ancient civilizations in Egypt, China and other areas, has always been closely linked with medical advances. Western Medicine is generally considered to be originated from Hippocrates, who, as is believed, first established lofty standards and strict scientific significance for medical practice. His ideal has furnished a set of principles and ethical guidelines for diagnosis and treatment in medical activities. From an ethical perspective, physicians are expected to alleviate the pain of patients in an observant and humane manner.

Despite the great significance of Hippocrates' moral concern to the practice of modern medicine, in the course of hundreds of years since humans began to set up hospitals, for most of the time, medical activities and processes pursue as much as possible the objective effects while ignoring the patient's subjective feelings and interactions. Thanks to the findings of pathogenic microorganisms and the cognition of infectious diseases, the causes of disease incidences have been clarified from a biological perspective. People understand life, health and disease from an integrated biological and medical point of view. In the knowledge about health and diseases, people deem health as a dynamic balance between the host (human body), the environment and pathogens, the destruction of which leads to diseases. Such biological determinism studies the physiological and pathological changes of human body according to levels of human organs, tissues, cells, etc., claiming that each disease can be found with morphological, structural and biochemical metaplastic changes in the body, thus confirming the biological, physical, and chemical pathogens, to enable appropriate treatment measures. Biological determinism led directly to the hospital with the disease clinical diagnosis and treatment activities for

the center (Disease-centered). Biological determinism directly leads to Disease-centered clinical diagnosis and treatment, the core processes of which include the determination of biological causes and the application of biomedical interventions. This Diagnosis and Treatment Process, which is based upon biological determinism and reductionism, is expected to be objective, standard and unified as much as possible, while ignoring the differences between individual patients. Meanwhile, with the continuous enrichment of biomedical knowledge, the physician's education, training and specialist hospital settings manifested a greater degree of differentiation (L Moreno, 1999). Most physicians are trained to become specialists solving certain health problems or diseases. In hospitals, patients were subject to disease-specific treatment in diversified departments. Specialist healthcare education and healthcare units have prompted a diagnosis and treatment process, and a physician-patient relationship dominated by specialized knowledge of physicians, whose knowledge and attitude become an important foundation for the establishment and change of clinical processes. At this time, the hospital's clinical process is still seeking objectivity, standardization and unification, but a strong specialization characteristic adds in, thereby it is considered to be a physician-centered clinical practice pattern.

In the wake of the later 1950s, acute infectious diseases, such as plague, cholera, smallpox, tuberculosis, that used to threaten mankind with apparent simplex biological pathogenic factors, have been controlled or eliminated; while cancer, cardiovascular vascular diseases, AIDS, autoimmune diseases, genetic diseases and trauma, which are significantly affected or influenced by psychosocial factors, gradually become the major diseases and the main cause of death of mankind. Tens of millions of people worldwide each year die from these diseases, the incidence continued to show an upward trend, rendering the main object of medical study to shift from infectious diseases and common diseases, to major chronic and degenerative diseases. While chronic disease prevention and control has not yet made a significant breakthrough, human beings begin to have a deeper

understanding of these diseases, they become aware that the development and progression of chronic diseases are the result of the combined effects of multiple factors, which are, in addition to biological factors, closely correlated with people's life habits, behavioral patterns, and environmental pollution, etc. (Glasgow et al. 2001, Barr et al. 2003). As early as in 1948, the United Nations World Health Organization has presented in its Charter: "Health is a full State of a physical, mental, and good adaptability, and not merely the absence of disease and infirmity." In 1977, Engel criticized the limitations of the biomedical model, and proposed a biopsychosocial medical model, stressing the need to pay attention to people's psychological and social factors; this has caused a strong repercussion in the field of medicine. The concept of Patient-centered care is an embodiment of such a new medical model in clinical practice. In 1950s, Professor Balint first proposed in his study the "patient-centered" concept, and compared it with the "disease-centered" concept. "Disease-centered" diagnosis and treatment process is mainly focused on changes in physiology, ignoring the impact of social, spiritual, psychological factors etc., on diseases; while "patient-centered" diagnosis and treatment process takes into full account, on the basis of the understanding of the nature of disease, the patient's life style, social environment, mental state and other factors influencing the generation and development of diseases, to form a "patient-centered" thinking model (Anderson, 2002).

Differing from disease-center or physician-centered clinical practice, patient-centered practice emphasizes patients' individual differences, social attributes; emphasizing patient participation in clinical decision-making and self-management and care; emphasizing physician-patient communication and continuity of disease diagnosis and treatment; and emphasizing patient experience and satisfaction in treatment process. From the beginning of the 1980s, the patient-centered concept slowly began to be accepted by medical personnel and incorporated into the clinical process. Although patient-centered practice has not been uniformly defined, evidence from a number of randomized controlled trials

(Little et al., 2001, Chambers, Parsi, Schupp & Armstrong, 2012), based on consensus, suggests that patient-centered clinical processes and practices are more conducive to the patient's clinical outcome as compared with the traditional processes and practices. In 2001, Institute of Medicine in the United States proposed that patient-centeredness is one of the six elements of the quality of medical services (Institute of Medicine, 2001). Although patient-centeredness as a concept or slogan seems to have been rather popular, but limited to the technical and policy factors, the actual realization of it still has multiple challenges.

1.1.2 Evolution of Chinese hospital management

After the founding of New China, the Chinese hospital construction witnessed a momentous development. In 1949, China had 2600 hospitals, and 30 sanitariums (nursing homes). In 1957, hospitals above the county-level reached 4,179, with 294,733 beds, and 1,039,208 medical staff. The fresh look of Chinese hospitals was manifested not only in the rapid growth of the above-mentioned hospitals and beds, but also in the remarkable progress and development of hospital organization and management, medical technology, health care morale and other aspects. After the reform and opening up, Chinese hospital construction grew at a faster pace. In 1997, China had 16,376 hospitals nationwide, with an increase of 6,339 over that of 1980; real number of beds amounted to 2.15 million, up by 950,000 over that of 1980; total hospital staff topped 307 million people, accounting for 56% of the national professional health personnel, with an increase of 1.49 million (of which there were 1.2 million increase in health workers) over that of 1980. Meanwhile, large medical technology and equipment saw an accelerated upgrading and medical facilities were significantly improved. Color B-ultrasound, computerized tomography equipment, MRI equipment, automatic biochemical analytical instruments and other modern medical equipment became necessary configuration for most hospitals.

Recalling the development of Chinese hospital management model, there are approximately three modes, successively, as follows: scale mode, quality mode and the patient-centered management mode. The so-called scale mode refers to hospital

management based on scaling up, including the expansion of the number of beds, infrastructure construction, diseases being diagnosed and treated, as well as talent teams and the like. The quality mode refers to hospital management based on intensive knowledge, intensive organizations, symbolized by ISO9000 standard certification; currently the majority of the hospital's management model belong to this category. The patient-centered management refers to hospital management based on the "patient-centered" idea, be it size expansion or quality improvement, the final criterion lies on the facilitation of patient visits, the advantages for diagnosis quality, and the benefits for patient rehabilitation and functional recovery (Zhang 2003; Zhang 2007). Based on this model, there have been a lot of practices, but in the lack of a sound and systemic management system, many practices become a mere formality.

With respect to the external environment of the hospital system and management model, the changes to the system configuration of hospitals are rather small. From the beginning to the present, clinical process design of China's hospitals is built on a hierarchical structure with function-oriented sectors. This approach has its positive significance originally, but now it seems that the hierarchical architecture is increasingly unfit for environmental change and the "patient-centered" management model, and to some extent, even become an obstacle for better patient experience and quality of service. This is because the changes in either the environment or management models are demanding more and more inter-departmental functions and services to establish a patient-centered clinical process.

1.1.3 Challenges of Chinese hospital management

Hospitals are medical institutions with the primary purpose of treating and nursing patients, with a certain number of beds and facilities to cure and prevent diseases for specific groups or masses, through collective collaboration of medical staff. The aforementioned brief history shows that the current hospitals are the fruition of centuries of evolution; their development and changes are closely related

with the socio-economic, political and cultural changes and developments in China. Since the beginning of the 1980s, the hospital system has faced with profound environmental changes, more complex and variable conditions, and multiple challenges.

1.1.3.1 The change of demographic characteristics

In the past few decades, the disease spectrum and causes of death that impact most of the world population (including China's) health saw profound changes. On the one hand, some traditional high lethality, readily transmitted diseases such as cholera, plague and others, are largely been brought under control, while a number of non-communicable chronic diseases such as cardiovascular disease, diabetes, and trauma, etc., gradually become the primary cause of death in the population. On the other hand, with the changes of human economic activities (such as globalization and ecological damaging production), some new infectious diseases continue to be found, posing even greater threats to people's health and property, and caused substantial socio-economic losses; in addition, mental disorders has gradually become an important issue affecting community health and social stability. Secondly, since the 20th century, along with the continuously improved health care conditions, the gradually increased level of nutrition, and the significantly improved sanitation and living conditions, life expectancies of most countries' population have been prolonged due to the combined effect of these factors. The fifth national census showed that the population aged 65 and over is 88.11 million, accounting for 6.96% of the total population(Shanlian et al., 2008). Compared with the 1990 national census data, the proportion of the population aged 0-14 declined by 4.80 percentage points, while the proportion of the population aged 65 and over rose by 1.39 percentage point; some medium-sized cities have become aging cities, population aging is on a fast pace. Experts speculate that by 2040, China's elderly population will reach 350-450 million. Population aging shall bring a series of profound social problems, and pose serious challenges to health care services (Fu et al., 2003; Jiang et al., 2009; Meng et al., 2011).

Based on the understanding of the trends of population health, the new bio - psycho - social medical model is widely accepted by people. Hospitals, as the core subsystems in health care system, must try to adapt to this change.

1.1.3.2 Growing concern for medical cost containment

Over the past decade in China, "High Expenditure" in hospital visits has become people's topic of concern. The Third National Health Services Survey found that the growth rate of medical expenses, which have become the third largest household spending only after food consumption and education (Thomsen et al., 2013), has outpaced that of the per capita income. Over the past five years, the annual per capita income rose 8.9% in urban areas, and 2.4% in rural areas, while the annual health expenditure of urban and rural areas rose by 13.5% and 11.8%, respectively. Other major countries of the world are experiencing or have experienced similar stages of rapid boost of medical expenses. In the United States, in 1990, the total personal health care expenditures was $ 609.4 billion, by 2002, that number was more than doubled, it became $ 1,340.2 billion, accounting for 12.8% of the GNP.

The rocketing of health care costs, either oversteps ordinary people's ability to pay, such that government policies and administrative capacity shall run the gauntlet, or overwhelms the government's public financial budgets (Shanlian et al., 2008). Therefore, medical cost containment has attracted growing attention and concern of the government policy makers. The consequent reforms include Organizational Reforms (such as collectivization and separation of suppliers and buyers), Selective Contracting, and Payment Reform (Eggleston, Ling, Qingyue, Lindelow & Wagstaff, 2008). No matter what kind of reform is implemented, hospitals and hospital managers will find themselves more and more exposed to the harsh financial environment. In order to adapt to this change, the hospitals have to reform the internal mechanism and engage in market environment improvement activities.

1.1.3.3 The increasingly competitive market environment

In parallel development with the increasingly demanding financial environment, today's hospitals will face an environment of increasingly fierce market competition. In the wake of the Second World War, governments of all countries have attached great importance to the construction of the health care system, which has enjoyed substantial prioritized public policies, the size and the number of medical institutions saw a great expansion in the world (Meng, Zhang, Yan, Hoekstra & Zhuo, 2012). However, when policy-makers find this kind of progress gradually incur unsustainable public expenditure. They began to seek new operation mechanisms, which brought forth a new round of reforms. Since the late 1970s, China gradually implemented various reforms transforming a planned economy to market economy. In this process, the governments' reimbursement ratio for state-owned hospitals gradually shrank, and hospitals were allowed to profit from pharmaceuticals and services, which will push them into market economy environment. While deepening the reform process, enormous market-oriented state-owned hospitals, private medical institutions, and foreign joint venture medical institutions constitute the main body of the medical market competition. In this market, the objects of medical services are often not covered by the health insurance Policies; therefore, they have to pay out-of-pocket, which in turn greatly limits their ability to pay or the purchasing power of medical services. Under the circumstance of enormous number of providers and the limited purchasing power of the objects (Moreno-Serra & Smith, 2012; Tang, Tao, & Bekedam, 2012; Dye, Reeder & Terry, 2013; Thomsen et al., 2013), the Medical market shall encounter the inevitable trend of fierce competition.

1.1.3.4 Greater pressure to improve the quality of service

Hospitals rely on what to win the competition in the market? The answer is, on competitiveness – quality, since quality has become synonymous with market competitiveness. As the world-renowned management expert Dr. Juran said, "The21st century is the century of quality" (Defeo, 2000). Survival and development of the hospital depends on not only the ability to cope with increasingly fierce

competition, but also on the internal management of the hospital, the capacity of medical services provided to satisfy the needs of patients, the key is "win-through-quality."

From another perspective, while patients becoming the subjects to pay medical services, they always expect to maximize their utility, and obtain safe, effective, fast, comfortable and respected medical services. However, plenty of hospitals, limited by their management system, service efficiency and technology levels, failed to satisfy the patient's expectations (You et al., 2013).

In addition, medical services as a fundamental problem impacting on the lives and health of the people, are getting more and more attention of the media, which grasp and left no stone unturned in various issues, from the moral hazards of medical personnel to medical service charges, from frictions of physician-patient relationship to major medical malpractices, from the hospital's internal regulations to the national macro-control policies. The quality of medical service, as the core of these issues, has been put under great pressure of public opinion.

Just because of this, the hospital needs to correct their management orientation, to firmly establish the "patient-centered" service concept and purpose of serving the people, strengthen hospital management, improve service attitude, regulate medical practices and improve quality of care, to ensure medical safety, and focus on solving the hot and difficult issues of people's pressing concerns.

1.1.4 Motivations of the study

1.1.4.1 China's healthcare reforms

Given the huge population base and relatively limited health resources, the Chinese government has been trying to maintain a balance between promoting population health outcomes and controlling health costs. For this motive, the Chinese government launched a new round of medical and health system reform in 2009, purporting to provide "safe, effective, convenient and affordable" basic medical services and basic public health services to every Chinese citizen. Up to now, the most remarkable achievement of this round of reform goes to the

improvements and standardization of the health financing mechanism, which have established medical insurances, in one way or another, for more than 98% of Chinese citizens, and basically realized universal coverage of insurance mechanisms. The establishment and improvement of the medical insurance system provided a great impetus for the development of China's public hospitals. On the one hand, the insurance stimulates the release of potential health needs of residents, prompting them to seek and obtain affordable medical care, to provide a market foundation for the development of public hospitals; on the other hand, the growing social and government investment renders better health output to become an increasingly important political objective, which has put forward higher requirements for internal management of public hospitals. In fact, the reform of public hospitals is the most important and most difficult part in this round of health care reform. The important issues of reform lie in the approaches to establish a modern hospital management system to improve resource utilization efficiency, ensure the quality of medical services, and improve patient satisfaction. The establishment of a patient-centered medical service concept, and its implementation in management and clinical practice, shall be an important measure to promote quality and service enhancements.

1.1.4.2 Technology advancements

Like the world's major developed countries, the Chinese government recognized early that communications and Internet technology is an important basis for the success of health system reform, as well as an enabler to improve health service system. Chinese Hospital informatization began in the 1990s, with the development and application of hospital management information system as a starting point, and now it has gradually formed a complete and mature system. The vast majority of public hospitals have been established workstations for physicians and nurse. Laboratory information system (LIS), picture archiving and communication system (PACS) and other information systems have been widely used in hospitals. EMR-based (Electronic medical record) hospital information system (HIS) integration platform has gradually become the mainstream option of

Chinese hospitals. Some hospitals are using mobile technology and social media to further improve the medical service connectivity.

Hospital information technology can significantly reduce health care costs, streamline medical service processes, promote quality of medical services, and improve human-centered medical services. Hospitals take a series of information technology means to achieve patient-centered practice, including the establishment of local area network to improve registration, fees charging and dispensary process to facilitate medical treatment of patients; the establishment of medical guide and consulting platform by means of information to speed up the reporting rate, shorten the patient waiting time, etc. Some medical institutions also incorporated the patient-centered concept into the entire health care system, including the following examples:

- Pre-Admission information system for provision of health management services for the population, establishing and improving the population's health records and databases, building digital health management service system;
- During Treatment, data sharing is performed via HIS for rapid transfer of patient information, the integration of emergency registration, prescription pricing and fee charging is implemented through "E-card" to reduce patient queue-waiting time;
- Electronic patient guiding and voice charge-reporting system are implemented to enhance transparency and the patients' sense of fairness of medical treatment;
- Electronic medical records and clinical pathway management are implemented to achieve standardization and homogenization of health care process, and standardize medical service behaviors;
- After Discharge, education, counseling, and follow-up activities shall be conducted, taking advantage of medical institutions' human and information resources, to build a health rehabilitation service system.

1.1.4.3 Lack of theoretical research on patient-centered clinical process

As previously mentioned, albeit hospital managers and clinical practitioners have gradually accepted the concept of patient-centeredness, its specific content and principles are not yet defined in a unified and standard manner. In the 1980s, Vinnie et al stressed in a patient-centered diagnosis and treatment approach that, medical workers should stand more in the shoes of the patients to think and feel their way, to understand their true thoughts and feelings, and the reasons for their sufferings. In the 1990s, Stewart believes that patient-centered approach will include six parts: (1) explore and analyze the whole process of disease and onsets; (2) start from the overall and comprehensive understanding of the patient; (3) establish good communication with the patients, to jointly find effective solutions; (4) integrate disease prevention, health protection and cure of diseases; (5) stand equal with the patient to build a good "partnership"; and (6) recognize the limited boundaries of physician's capacity and insufficient development of medical science (as cited in Stewart et al., 2000; Stewart, 2001). At the beginning of this century, Ahmed and other related scholars redefined "patient-centeredness" from five aspects, including: To extend from a purely bio-medical point of view to psychological and social medicine, to treat patients' problems from multiple and human-centered perspectives; pay attention to the patient's feelings and experience aside from the disease itself; medical workers should be able to express appropriate emotions at the proper times, and share responsibilities and rights with patients; and to establish appropriate "Diagnosis and Treatment Alliance" in accordance with patient self-care, education, mental state, etc. (as cited in Brown, Stewart & Ryan, 2001). Davis et al. deemed that "patient-centered" features should include six areas: medical interventions, patient involvement, healthcare collaboration, integrated medical team, patient-centered medical research, and publicly available information (Davis, Schoenbaum, & Audet, 2005; Bertakis & Azari, 2011). Pique Research institutions also depicts eight kinds of patient-centered medical properties: respect of patient's values, patient selection and their needs, information and education, medical

intervention, emotional support to alleviate fear and anxiety, family and friends participation, sustainability and safety, psychological comfort and medical cooperation (Chambers et al., 2012).

The above reports basically revolve around the discussion of the connotation of patient-centered medical services, but in recent years, the research gradually turned to the actual realization of patient-centeredness in primary health care services, and there is still insufficient theoretical study on patient-centered clinical processes.

1.1.4.4 The Need to guide hospital patient-centered practice

In China, since the middle of last century, there has been constant thinking over the relationship of process for health care providers with patients and other stakeholders, which also includes reflections on the "patient-centered" philosophy. In the 1950s, the party and the government proposed under the planned economy the "All for the patient" principal; due to the economic system, the provision of services was on a maintenance basis; medical services still emphasized individual behaviors. After the 1970s, with gradual economic and social development, the society put more emphasis on democracy, people pay more attention to their own health, and the physician-patient relationship was also changing, from the previous patients' passive acceptance of treatment, to "patient-centered" medical services paradigm. People gradually realized that medical services do not just provide medical technology, and physician-patient relationship is not a simple economic one, what matters is the provision of comprehensive health service based on mutual trust and interdependence, equality and mutual respect. By the end of 1996, the former Ministry of Health for the first time clearly stated, during a meeting in Shenyang, the "patient-centered" philosophy, required hospitals to take "patient-centeredness" as the fundamental purpose of work and fundamental guiding principles to be followed in the health sector, to reflect the "People First" thinking in health system spiritual civilization. In 2005, in order to ensure proper hospital competition not at the expense of people's interests, and effectively protect the patients' reasonable and legitimate rights and interests, the former Ministry of Health launched the

"Patient-centered, Quality First" Hospital Management Year Activity. This Activity requires hospitals and medical workers to: be fully aware of their mission; put the "Pursuit of social benefits, safeguarding the people's interests and the establishment of a harmonious physician-patient relationship" in the first place; improve the hospital's "quality, safety, service and cost" management system; explore the establishment of long-term mechanism for hospital scientific management; and continuously improve the medical service quality and level, so that health care services can be more accessible to the people and the community, to continuously meet the people's growing demand for medical services. Since the Hospital Management Year Activity, a lot of hospitals, experts and scholars around the country explored the ways to improve health care quality and management, optimize service processes, and improve patient experience, in order to achieve the "patient-centered" medical service. Some scholars believe that, along with the diagnosis and treatment, physicians shall fully communicate with patients to get a comprehensive understanding of the etiology, the experience, awareness of the disease and feelings, to mutually discuss the treatment plan and come to consensus. Some scholars believe that, eight actions can lead to "patient-centeredness" (Anderson, 2002), including: (1) to enhance the service awareness, (2) improve service attitude, (3) streamline service processes and effectively facilitate patient visits, (4) strengthen the system to improve service quality, (5) cut medical costs to reduce the burden on the patients, (6) strengthen infrastructure construction to improve the medical environment, (7) establish and reinforce supervision and management system, (8) establish and improve patient-centered service system. In short, in the process of formulation and implementation of development strategy, enhancing core competitiveness, and seizing the medical market, medical institutions become more and more concerned over to the research on achieving "patient-centeredness" in medical service.

Western scholars described in theory the "patient-centered" concept, and put forward a number of dimensions for evaluation of "patient-centered" health services.

Comparatively, China proposed earlier the "patient-centered" service concept, although it stays more in mere slogans and ideas, without systemic strategies and methods for the implementation and evaluation of "patient-centered "medical services in medical institutions. More and more hospitals claimed the full swing of "patient-centered" medical services, but almost all of stay in the "just-do-it" stage based on competing demands. Chinese literature retrieval found no relevant studies to provide theoretical support and implementation guidance on scientific and effective implementation of patient-centered health care system, and no literature was found for realization of patient-centered health care in the service process of medical institutions.

1.2 Research questions

In view of the status quo of existing research on patient-centered practice in Chinese hospitals, this study aims, through a series of research activities, to answer the following three research questions:

1.2.1 What constitute patient-centered clinical process (definition and key dimensions)?

How to define the patient-centered clinical process? What are the core dimensions included in Patient-centered clinical processes? The answering of such questions shall prompt the evolution of "patient-centeredness" from ideal to conceptual level, and then to the operational level. This can provide a conceptual framework and theoretical tools for the study of patient-centered clinical processes, and also provide a theoretical basis for improvement of patient perceived value and patient experience in clinical practice.

1.2.2 How do different patient-centered clinical process dimensions affect patient-based outcomes?

After an explicit definition of the concepts and core dimensions of patient-centered diagnosis and treatment procedures, the next question is how these different dimensions affect the demander-side outcome in clinical services. How to measure the correlation between different dimensions and patients outcome

variables? These issues determine which dimensions and aspects will be prioritized while improving the clinical processes.

1.2.3 What are the antecedents that determine the different patient-centered clinical process dimensions?

At the same time, when the author looks at the various dimensions of patient-centered clinical process, we shall take into account its internal and external environment. In the present study, the author selected one hospital as an object for observation and analysis, to evaluate the various dimensions of clinical processes, in particular, from the perspective of the patients. In this context, the determination of factors affecting the core dimensions of patient-centered clinical processes contributes to further understanding of clinical process transformation and optimization from the patient's perspective, thereby improving their clinical outcomes and perceived value.

1.3 Overall research methods

To achieve the research purpose, the appropriate answer research questions, this study used a variety of qualitative and quantitative research methods. Now the appropriate research methods briefly described below. (Detailed research method described in Chapter 4.)

1.3.1 Literature review

Appropriate search strategy will be developed to collect Chinese and foreign academic literature and policy documents related to the present research topics. Through literature and policy review, comparative analysis will be made on the concept of patient-centeredness, to further define the concept of patient-centered clinical process, and determine its core dimensions, to form the conceptual framework of this study. Based on the literature analysis, an index set will be formed to evaluate the different dimensions of patient-centered clinical process, and determine the various influence factors related to the patient-centered clinical trial process.

1.3.2 Case study of Yuebei People's Hospital

Yuebei People's Hospital is Class III-A hospital located in the northern mountainous area of Guangdong Province, China. The hospital has explored and practiced patient-centered clinical processes and management since 2003. Over a dozen years of development history, the hospital achieved leap-forward development, scaling up from approximately 800 beds in the past to over 3000; patient experience and satisfaction has also been greatly improved. In this study, this hospital will be selected as object of case studies, to abstract and summarize the characteristics and effects of patient-centered clinical process.

1.3.3 Interviews with physicians, nurses and patients

Taking Yuebei People's Hospital as a base, this study will select the hospital's physicians, nurses and patients as interview subjects, the researchers conducted interviews in person vis-a-vis, to extract information related to the contents, dimensions, implementation and effects of patient-centered clinical process.

1.3.4 Questionnaire development

Through literature review and interviews, the main dimensions, sub-dimensions and the corresponding measurement items of the questionnaire shall be generated and subject to Q-sort procedures for qualitative evaluation of its content validity. Before the launch of formal investigation, pre-test of questionnaires will be conducted for examination of its applicability, and corresponding modification. Factor analysis will be employed to verify its construct validity.

1.3.5 Survey data collection

Outpatients and inpatients of Yuebei People's Hospital will be randomly selected for questionnaire, which will be performed face to face by trained senior graduate students, who will also perform crosschecks to ensure the integrity, correctness and accuracy of the questionnaire.

1.3.6 Framework testing

Through literature review, the research framework will be obtained, and validated via interviews with relevant staff, and factor analysis. Through focus group

interview method, the Research shall acquire the understanding and awareness of hospital administrators, clinicians and caregivers, and the patients, on patient-centered clinical process. The interviews will be summarized and analyzed to generate core dimensions after comparative literature analysis. The Research Framework shall be subject to qualitative verification, to ensure content validity. In addition, factor analysis is employed to analyze the construct validities of a number of measurement items on the core dimensions of different patient-centered clinical processes. The regression equation is applied to examine variables with different dimensions and identical outcomes, and the relationship between different dimensions with their potential influence factors.

1.4 Significance of the research

1.4.1 Unique context of Chinese healthcare system and management

This study positions itself to the unique environment of China's changing and developing health system. For China, the health system is in a rapid transformation period. On the one hand, this transformation is reflected on an epidemiological transition, that is, chronic diseases are becoming the primary morbidity and cause of death of China's population in both rural and urban areas. This change of spectrum of disease and death causes has put forward new demands for health service delivery model, which needs to be transferred from disconnected, fragmented, acute-disease-centered service system to patient-centered, continuous, integrated service delivery system. On the other hand, as a political commitment, China is gradually moving towards universal health coverage, denoting not only the establishment and implementation of universal health insurance system, but also low-cost and high-quality health care service for all. To successfully deal with this transition is a major challenge for Chinese hospital administrators, who are also exposed to a unique practical environment: faced with market-oriented competitive pressures, while having to obey the planned-economy-style administrative constraints, in combination, the pressures and constraints form a temporal environment that, more often than not, prompt the Chinese hospital administrators to

adopt emerging technologies, and test new service processes and models. When they select the patient-centered service concept, and incorporate it into various business processes, the innovative models developed shall have a unique meaning. The object of observation selected in this study – Yuebei People's Hospital of Guangdong Province – has made a leap-forward development just in such an environment and manner. Therefore, the findings of this case study of empirical research on patient-centered clinical processes can provide new knowledge and experience for hospital management researchers and practitioners both nationally and abroad.

1.4.2 Empirically develop key dimensions of patient-centered clinical process

Although the patient-centered concept has been proposed for many years, to date there is still no fully unified understanding of its forms, definitions and core elements. For academics or practitioners alike, patient-centeredness stays more often as a conceptual construct. Although many institutions developed some guidelines, or service models, for clinical service in accordance with the patient-centered concept and performed some experimental studies to testify its positive relationship with patient outcomes, most studies still have no systemic and clear definition of the core patient-centered dimensions. Furthermore, diversified clinical processes constitute the basic units of all kinds of medical services the patients experienced, playing the most direct role for service quality and patients' perceived value. This study combines literature analysis with empirical research methods, to define and verify the core dimensions of patient-centered clinical processes. Theoretically, this is a supplement to patient-centered research; practically, it can provide services with more customer value to guide hospital administrators and clinicians.

1.4.3 Testing relationships between key dimensions of patient-centered clinical process and outcome measures.

The modeling of the relationship between the core dimensions of patient-centered clinical process, and patient outcomes, has its significance in two respects. The ultimate purpose of the proposition of the patient-centered concept is to promote clinical quality, improve patient satisfaction and quality of life. The

fundamental consideration in establishing a patient-centered clinical process is also to improve the patient's outcome indicators. The quantitative relation model based on core dimensions and patient outcomes can encourage further understanding of their intrinsic link, to provide decision-making basis and theoretical guidance for management decisions and process improvements. On the other hand, the core dimensions of patient-centered clinical processes are developed on the basis of literature analysis and qualitative interviews, building the relation model between these dimensions and the patient outcomes can quantitatively verify the conceptual framework of patient-centered clinical process. Methodologically speaking, new tools and approaches have been provided for the quantitative evaluation of the effect of patient-centered clinical process.

1.4.4 Testing relationships between key antecedents and dimensions of patient-centered clinical process

This study will also examine the relationships of various dimensions of patient-centered clinical processes with potential influence factors. Past studies have focused on the influence of hospital environment and health care staff themselves upon patient-centered services. This study shall start from the patients themselves and their perspectives, and focus on exploring the relationship between patient-related characteristics with patient-centered clinical process. Thereby this research provides a supplement for existing studies in this field.

1.5 Organization of the thesis

This thesis is divided into six chapters. Chapter 1 describes the research background, research questions, overall methodologies, and the significance of the research; Chapter 2 performs the literature review; Chapter 3 presents the research framework; Chapter 4 introduces a variety of research methods, as well as the methods and procedures for collection of information; Chapter 5 describes the major findings; and Chapter 6 is for discussion and conclusions, while pointing out the limitations of the study and directions for future research.

Chapter 2: Literature Review

The literature review is organized into two sections. The first one focused on the comparisons of traditional and patient-centered clinical processes, with respect to several dimensions adopted in clinical process evaluation, such as management, treatment, nursing, Information Technology (IT) adoption and so forth. Then the author reviewed several relevant theories, such as consumer value, value chain, and total quality management, which can be integrated as theoretical foundation for our study.

2.1 Comparisons of traditional and patient-centered clinical processes

2.1.1 The concept of patient-centeredness

"Patient-centeredness" originates from the reflection on patient observational studies and practice (Stewart, 2001). It is intended to improve the quality of medical services and ensure medical safety. In 1996, China's Health Work Conference also proposed a "patient-centeredness" slogan, the service concept of medical institutions also gradually shifted from "disease-centered" and "physician-centered" to "patient-centered." This is the demand of the public as well as the hospital building, but also the inevitable trend of healthcare reform. It is a key part of the health system, a future direction of medical service that can effectively guarantee the patients' access to health services.

As the preferred method for patient medical care, "Patient-centeredness" has been broadly defined, the most accepted definition is by the US Institute of Medicine: "patient-centered" healthcare is a partnership established among participants of medical activities，including the healthcare practitioners, patient and patient's family, to ensure that while medical decisions are made, the patient's needs, ideas and wishes can be respected, and patients are entitled with the education and

support needed for that decision-making, so as to achieve patient involvement in his own medical care. It has become a core composition of high-quality healthcare (Institute of Medical, 2001; Bertakis & Azari, 2011). Currently, in primary care, community health, and treatment, prevention, care of chronic and major diseases, etc., "Patient-centeredness" gradually plays its important role. An international study of federal funds in 2003 for physicians and medical quality showed, a quarter of the physicians have incorporated some elements of "Patient-centeredness" into primary care (Davis, Schoenbaum & Audet, 2005). The elements, according to Karen Davis, should cover seven areas: interventional medical, patient involvement, Healthcare Collaboration, integrated medical team, patient-centered medical research and publicly available information. Picker's research agencies also depicts the eight Characteristics of "Patient-centeredness": respect of the patient's values, patient choice and needs, information and education, medical intervention, emotional support to reduce fear and anxiety, involvement of family and friends, sustainability and security, psychological comfort and medical cooperation (Chambers, 2012). In 1998, at a Meeting held in Salzburg, Austria, half of the participants proposed that "Patient-centeredness" requires a physician to be patient like a computer; patients shall complete the questionnaire on a regular basis to feed back the results to the physician to improve the latter's service and care; the physician and patient shall sign a contract on health care quality and objectives suitable for the patient's current condition, as the basis for performance evaluation, and integrate community resources to medical service (Wagner, Davis, Schaefer, Von Korff & Austin, 1999; Davis et al., 2005).

According to the various characteristics of "Patient-centeredness", as well as the summary and analysis of multiple findings in this respect, this paper compared and analyzed traditional healthcare with "patient-centered" healthcare in the following five aspects, and proposed patient-centered service model accordingly, illustrated by Table 2-1.

Table 2-1 Different dimensions of the traditional healthcare model and patient-centered service model

Model		**Traditional healthcare**	**Patient-centered healthcare**
Management model	Business processes	Facilitate physicians and nurses and hospital management arrangements	Fast, convenient diagnosis and treatment, attach importance to privacy and dignity
	Incentives:	Full-cost accounting	Multidimensional assessment, focusing on patient satisfaction
	Medical goal	Cure rate, improvement rate	Global health, attach importance to prevention
Care model	Nursing process	Passive response to patient demands	Active involvement in patient demands
Diagnosis and treatment model	Medical model:	Biomedical model	Physiological, psychological and social model
	Right of choice	Physicians made decisions	Patients have the right to know, to choose and to supervise
	Supply of medical service	Pursue high-tech, high consumption	Suitable, appropriate
Communication model	Focuses	Focus on medical demands, hospital centered, establish measurement forms for satisfaction	Focus on patient demands, establish measurement forms for dissatisfaction
IT adoption model	Security	Patient's individual responsibility	Self-maintenance of the system, set great store to privacy and security
	Information transparency	Not disclosed	Relatively transparent

Source: The Author.

2.1.2 Patient-centered healthcare model

2.1.2.1 "Patient-centered" management model

In 2001, the US Institute of Medicine defined "Patient-centeredness" as a MUST for not only physicians, but for the entire health system as a whole. This requires health systems to provide guidance and support for the realization of "Patient-centeredness", medical and health institutions to establish a "patient-centered" management model fundamentally, the "patient-centered" service concept shall be deep-rooted in the heart of every medical worker, as the essence of the purpose of hospital establishment and hospital culture.

(1). Awareness of public health, the establishment of multi-dimensional evaluation system.

Hospitals shall be highly aware of public health, taking Global Health and prevention as the goal of health, be vigilant of epidemics or high incidence diseases occurred at a certain time, explore the causes of prevalence and onsets for timely prevention, and improve population health. Meanwhile, they shall not simply pursue high cure rate and improvement rate as performance evaluation standards of medical staff, but should focus on patient satisfaction, establish a "patient-centered" evaluation system for medical staff for multidimensional assessment

(2). Patient visits process optimization

Traditional physician-oriented processes were more concerned about the facilitation of medical staff and hospital management arrangements, while patient-centered processes focus more on facilitation and convenience for patients. Patient visits encompass a whole process from appointment to discharge to physician follow-ups, the process can be optimized from two aspects: time and quality, namely, easy access and effectiveness of medical services. Easy access includes: easy appointment, patients can choose appointment according to their own schedule; reservation timeliness; shortened waiting time in hospital; efficient use of time for physicians and patients; e-mail or phone call at appropriate time instead of face to face diagnosis and treatment; electronic prescriptions; health services easily

accessible at night, on weekends and holidays and other non-peak time; effectiveness includes patient information desk, hospital guide, and provision of quality services.

(3). Formation of multi-disciplinary medical team to improve patient satisfaction

A hospital is a comprehensive service system, its reform and innovation should always aim at improving efficiency and quality, to create a flexible, patient-focused hospital structure. Under an environment with incessant improvements of both hardware equipment and network management, the formation of multi-disciplinary medical team, including physicians, experienced nurses and other needs of social workers, dietitians, health educators, psychologists, sociologists and other behavioral health scientists, can provide comprehensive healthcare services and information transfer, and reduce duplication of information and experimentation (Toop, 1998; L Moreno et al., 1999).

2.1.2.2 "Patient-centered" model of care

In the past, the main work of nurses is to provide patients with supplementary support, including informing the procedures and considerations of diagnosis and treatment; patient behavior description (do's and don'ts); conventional or specific care, which enables the nurses with more control over patients in the process of interaction. During interviews with the nurses, some scholars are informed that many ward nurses are too busy to spare much time to each patient, the nurse has to convey as much information as possible in a very short period of time to a patient, resulting in poor nurse-patient relationship and low patient satisfaction (Sorlie, Busund & Srlie, 2000; Ba¨ckstro¨m & Srlie, 2006; Bergvik, Wynn & Sorlie, 2008).

(1). Establishment of a "patient-centered" "nurse - patient interaction"

- Nurses shall adapt to the patient's language and personal habits to promote contacts and mutual trust.
- Correct care attitude, listen carefully to the words of the patient, and understand patient questions.

- Provide suggestions to alleviate patient anxiety, patiently explain issues beyond the patient understanding, and correct misunderstanding.
- Inform the patient of their related information.
- Show concern and interest for the patient's feelings.
- Help patients for self-regulation.

(2). Improve nursing skills

Nursing skills, as the basic skills of nurses, concerns quality of care and patient safety, and therefore must also be incorporated into the assessment contents of patient-centeredness, at critical times, fast and high-quality care can play a vital role to save the patient Life.

2.1.2.3 "Patient-centered" treatment model

Physicians should take "Patient-centeredness" as the personal value of life, holding it throughout the entire diagnosis and treatment process. Steward et al. (2000), from British Family Medicine Research Center and the Department of Epidemiology and Biostatistics, pointed out in a paper that "Patient-centeredness" includes some interaction with the patient six physicians, one is not only to understand the patient's physician disease, but also to take active steps to find a patient sick feeling, their perception of their disease, the impact of the disease on their daily lives as well as their expectations; the second is the understanding of the patient's physician; the third is for the hospital management, physicians and patients to find common ground; fourth physician is to help patients in disease prevention and health promotion; fifth, strengthen the links between physicians and patients; finally six is "patient-centered" to follow the principle of seeking truth from facts. Many experts also pointed out that "Patient-centeredness" shall start from multidisciplinary study and multi-perspectives, including humanism, psycho-sociology, as well as ethics (Stewart et al., 2000). After a comprehensive understanding of the patient's anxiety, Medical Decision shall be made in consultation with the patient, highlighting the importance of patient involvement in decision-making. "Patient-centeredness" emphasized that Physician is not the only

person to determine what is next for the patient, the right to accept or reject the diagnosis or treatment lies in the hands of the patient, whose access to consulting services also depends not on the physician's schedule or expectations, etc., but on satisfactory consensus upon physician-patient mutual discussion. This showed that, in the "patient-centered" Process, medical workers must follow the wishes of the patients, and provide information to patients to help them make the right decision. This is conducive to enhancing self-control and self-efficacy of patients. To be "patient-centered", Physicians should adapt and immerse themselves to the patients with illness, rather than limit themselves to patients' diseases, the ultimate goal is: to understand the real experience, needs and expectations of the patients.

(1) In the diagnosis and treatment process, patients and physicians are equal partners, the physician should clearly convey information to patients, there have to be adequate communication between medical staff and patients so that patients can tell their bona fide ideas and release their emotions, without physician-centeredness, a sustainable partnership can be established upon common discussions.

(2) Take into account as much as possible all factors that influence decision-making and treatment, including the patient's illness, personal factors (culture, beliefs, values, needs, wishes and personal habits, etc.), medical environment, medical technology, etc., Based on this, personalized treatment decisions shall be proposed, especially in the case of different patients with different outcomes upon different alternatives.

(3) Integrated use of conventional therapy and alternative therapies, with patient-first perspective, to provide patients with the most suitable, moderate and appropriate treatment methods that best meet the patient's own situation and needs, not the pursuit of excessive-quality and high consumption.

(4) Health promotion and disease prevention, through health education, patients and their families can be aware of their responsibility for health, maintain and stay healthy and improve disease prevention capabilities. Physician's responsibility is not just to restore the patient's health or relieve the pain caused by disease, but to help

patients to face the disease with a positive attitude, to keep the patient away as far as possible from diseases (Hak & Campion, 1999; Bensing, 2000; Larivaara, Kiuttu & Taanila, 2001; Alamo, Moral & De Torres, 2002).

2.1.2.4 Patient-centered communication model

Steward et al. (2000), from British Family Medicine Research Center and the Department of Epidemiology and Biostatistics, studied the role of "patient-centered" communication in primary care, random interviews were conducted upon 39 family physicians and their 315 patients, and evaluated the Patients' health condition, diagnostic tests, physician interviews, and patient self-assessed health reports, the results showed that "patient-centered" communication is conducive to the patient's self-cognition, which has a certain role in promoting recovery, calming down anxiety and mental activity, improving health status and medical efficiency (Stewart et al., 2000). In addition, effective communication between the patient and the medical staff can improve health care quality and safety, and reduce the rate of misdiagnosis, while adverse communication may lead to adverse events, resulting in medical accidents (DiMatteo, 1998; Alvarado et al., 2006; Dykes, Carroll, Hurley, Benoit & Middleton, 2009; Caligtan, Carroll, Hurley, Zaremski & Dykes, 2012).

"Patient-centered" is built on the foundation of good communication between the patient and medical staff; medical workers should understand the health needs of the patient, while the patient should understand the medical staff's recommendations for diagnosis and treatment, so as to participate into their own treatment. Therefore the aim of "patient-centered" communication is to help medical stuff to provide services commensurate with the patient's wishes, needs and values, allow the patients to participate in their own health and healthcare decisions. Thus, effective communication and good communication skills are very important (Gillies, Shortell, Anderson, Mitchell & Morgan, 1992; Marvel, Epstein, Flowers & Beckman, 1999; Nestel & Betson, 1999; Stewart et al., 2000; Brindiset al., 2001; Brown, Steward & Ryan, 2001; Nestel, 2001; Anderson, 2002; Anderson, Rainey & Eysenbach, 2003; Michie, Miles & Weinman, 2003; Jones et al., 2014).

To this end, more and more measures and methods are being taken for the implementation of "Patient-centeredness" to reduce communication barriers, for example, the US Department of Health for Minorities carried out cultural and language skills training courses for physicians (Gremigni, Sommaruga & Peltenburg, 2008; Bertakis & Azari, 2011). However, the "patient-centered" communication can be affected by many factors, in addition to culture and language, the patient's race, religion, level of education or the patient's own factors are likely to impact patient-physician communication (Larivaara, Kiuttu & Taanila, 2001). Influence factors of "patient-centered" communication include patient factors, physician factors, related factors and health system factors. Patient factors include the severity of illness, personality, previous experience of illness, cultural values & family factors, socioeconomic status, emotional pain, and expectations. Related factors include sustainability, racial harmony, trust, harmony of faith and values, and expectations. Health system factors include easy access to medical services and medical insurance, the physician's choice, environmental factors (noise, smell), the staff etiquette, waiting time, electronic communication, time and frequency of hospital visits. Physician's factors include time and frequency of visits, physician's personal factors, risk aversion, self-supportive capacity, understanding of the patient as an individual, and positioning of "Patient-centeredness". Based on the research experience of others, the author introduced the issues to be noted in communication from the following three aspects.

(1). Contents of communication.

- Exploration of the disease and disease experience: this section requires the physician to fully understand the patient's illness experience based on clinical experience. The indicators include physician responses to the patient's symptoms, feelings, ideas, expectations, impact of diseases, including interruption, and actively exploration or verification (Ford, Fallowfield & Lewis, 1996; Marvel et al., 1999; Roter & Larson, 2002);

- Exploration of the characteristics of the patients themselves to understand other factors that might affect the patient and disease, including the patient's needs, habits, attitudes, culture, beliefs and so on (Mead & Bower, 2000; Little et al., 2001);
- The patient's rights and obligations, help the patient relax and build equal relationships with physicians, dig out the inner thoughts of patients;
- Physicians discuss treatment options, the objectives to be achieved with patients.

(2). Communication channels

Communication channels should be diversified, and should not be limited to vis-a-vis communication. Many patients hope to communicate with physicians via e-mail or telephone, to avoid tension or ensure timely communication with the physicians when conditions not met for vis-à-vis (Malone et al., 2004; Whitehead, 2007; McInnes, Gifford, Kazis & Wagner, 2010; Suris, Akré, Berchtold, Bélanger & Michaud, 2010).

(3). Communication Environment

- Medical personnel should create a relaxed atmosphere for patients, including the physician's attitude, body language, and clinic and ward environment;
- Prevent interruption or disturbance of communication;
- Responded positively to the patient's questions, psychological and social problems, and things of concern, to create a good atmosphere for patient interaction (Marvel et al., 1999).

2.1.2.5 Patient-centered model of information system

Creative application of information technology enables information systems to be widely used in many fields, the existing hospital information systems (HIS system) are mostly for department performance evaluation and cost assessment, while ignoring the end-user patients. Therefore, to improve quality of care, we have

to be "patient-centered", and the development trend of hospital information systems also should be "patient-centered" (Young & Chang, 1997; L Moreno et al., 1999; Young, Walsh, Butow, Solomon & Shaw, 2011).

(1). Safety and privacy protection

To ensure Patient-centeredness, we must first ensure medical safety, nothing is more important than the patient's life. But medical accidents often occurred, even on the rise. Previously, safety problems were often ascribed to the patients, who are always blamed for their own reasons, but "Patient-centeredness" can reduce medical malpractices through system maintenance, information systems can prevent errors and adverse factors, and rapidly respond, track and feedback adverse factors (Chertow et al., 2001). Information technology can accurately calculate the required doses for different patients. Safe medication requires the development of a computerized decision support system. In addition, information systems can improve communication; inadequate or inappropriate communication between physicians and patients is one of the causes generating negative factors. A new generation of information technology - computer coverage system, including registration, discharge, digitized personal assistants, electronic medical records system to improve the accuracy of information exchange, and reduce physician-patient, physician-physician miscommunication (Bates & Gawande, 2003). At the same time, it puts more emphasis on patient privacy protection.

(2). Information disclosure, improve the utilization of information

Clinical information systems can support high-quality medical services, such as registration, monitoring, and experiments. Results of clinical diagnosis can be quickly delivered to physicians and patients. Physician and patient decision support system, automatic recommended treatment information, and the charts about risk factors and outputs can act as the patient's health assistant. Electronic medical records and electronic health records can facilitate patient access to personal health information. Timely disclosure of medical staff information will also help the patient choice of physicians and treatment time (Bosworth, Powers& Oddone, 2010;Rich,

Lipson, Libersky, Peikes & Parchman, 2012). Phone or network information system can strengthen the patient's self-management, health promotion and prevention of errors. Survey shows 60% of the patients hope to get access to, through network, the appointment arrangements, electronic medical records, test results and their treatment plans. In this way patients can grasp the their own health information, which also has a positive effect on patient's outcome and patient satisfaction (Caligtan et al., 2012; Stellefson, Dipnarine & Stopka, 2013; Jones et al., 2014; Pauwels, Buist, Calverley, Jenkins & Hurd, 2001).

2.1.3 Summary

Patient-centeredness is built on the basis of people-oriented principle, and the increasingly serious situation of tense physician-patient relationship due to "physician-centeredness" and inequality between medical staff and patients. It is a service model put forward from the patient's perspective for comprehensive understanding of the patient needs. It is very different from the traditional model of medical services. In the process of transition from traditional to "patient-centered" medical services, the hospitals cannot just change one aspect of a medical procedure and then claim to be "patient-centered". They must start from the comprehensive perspective, fully implement the "patient-centered" thinking, and let the concrete "patient-centered" measures to be taken in all aspects of hospital construction.

2.2 Theoretical bases for patient-centered clinical process

2.2.1 Customer value theory

2.2.1.1 Customer value perspective

Customer value perspective refers to the aim of pursuit of a customer at the time of purchase and consumption. At present, most researches on value aspects of customers are concentrated in this area, so there has been a substantial discussion on the connotation of customer value. The following are different researches and definitions of customer value by scholars from different angles.

(1). Customer perceived value

Zeithaml (1988) used means-to-end chain to explore and define the relationship between price, perceived quality and perceived value. In her model, she identified four consumer definitions of value: (a) value is low price; (b) value is obtained in the product; (c) value is the price paid for comparable quality; and (d) value is income for comparable input. Her research shows that customer value is the customer's trade-off between their perceived income and input, this understanding and trade-offs vary according to different purchasing scenarios and different consumer characteristics. She summarized these four definitions of customer value as: customer perceived value is a comprehensive evaluation of the product or service utility after the trade-offs of their perceived value with their costs paid for product or service.

(2). Utility

If consumers are purely rational, they will choose the option that gives the best value in a range of optional offers, and the value is referred to as "consumer's evaluation of the product's capacity to meet the needs," according to Kotler's point of view, value is also "customer satisfaction under the lowest cost for acquisition, possession and use" (Kotler, Asplund et al. 1999).

This understanding is based on utility theory of economics; it views a consumer as an "economic man" who can fully understand the value of offer, and choose in accordance with the principle of utility maximization. This definition of value involves utility evaluation, trade-off between various options, and other consumer behaviors.

(3). Use value

To research customer value from the perspective of use value is, in fact, to believe that customer value is generated in customer's specific consumption of the Offerings, is what the consumers perceived in consumption. As Woodruff (1997) believed that, customer perceived value is a cognitive bias and evaluation of the attributes of a product or service, the performance of these attributes, and the

utilization results in application scenarios that facilitate or hinder the realization of customer's goals and intentions. Customer value is particularly manifested in the capacity to complete a task or work (Wilson & Jantrania, 1994). This understanding of customer value indicates that customer value is related not only to the application performance of the Offerings, but also to its specific application scenarios. Thus, when an organization evaluate the value of its Offerings, it must also incorporate the consumer's own value chain, so as to fully understand the consumer's value expectations and the value of company Offerings to consumers.

(4). Relationship Value

Many scholars study customer value from a perspective of Relationship Value, deeming customer value as Relationship Value. On the one hand, customer value is perceived by customers in long-term relationships, in which the customers will have to evaluate the nature of business relationships and a series of cause and effects in this long-term relationship, to arrive at an understanding of value created by the enterprise. Therefore, the creation of customer value involves both parties of the customer and enterprise. Furthermore, since any relationship can create some value for both sides, value sharing has become a key issue in the relationship. On the other hand, the relationship itself has a major impact on customer recognition of value. In a relational context, customer value is not based on exchange of money and products, on the contrary, it is created and delivered along with the development of relations (Ravald & Grönroos, 1996). These authors believe that in the long-term trading relationship, focus shall be put on the Total Episode Value: Total Episode Value = (individual experience income + relationship income) / (individual experience sacrifice + relationship sacrifices)

In terms of a specific offering, Grönroos believes that, in the relationship category, an Offering contains the core product and various additional services enabling its performance. Its value includes price, and relationship costs based on relations arisen thereof. Therefore, study of customer value shall distinguish the core value with the added value of additional elements in relations. In Relationship

Category, customer perceived value can be expressed as: customer perceived value = (core product + additional services) / (price + relational costs), or customer perceived value = core value ± added value. However, when a customer has no intention of developing a relationship with an enterprise, the concept of relational value is no longer applicable.

(5). Customer Delivered Value

Customers can judge the value of goods and services in purchasing and consumption process, and under certain constraints, they are pursuers of value maximization; they form value expectations and buy goods from those companies they considered to provide the highest customer Delivered Value; they will know whether the goods meet their expected value, which will affect their satisfaction and the possibility of re-purchase. Therefore, companies must make customer satisfied to win customers and beat competitors; this requires companies to design and implement a competitive customer value delivery system.

Customer delivered value is the difference between total customer value and total customer cost. Total customer value is a series of benefits that customers expected from a particular product or service. Total customer cost is the expected costs of customers incurred in the assessment, obtaining and use of the product or service.

From the above analysis, we can see that customer value is purposeful and cognitive, is related to relationship and specific consumption scenarios, and is the result of comparison and tradeoff of the customer.

2.2.1.2 Customer value to the organization

Customer value to the organization is related to the benefits that a customer brings to the organization. According to (Kotler, Asplund, Rein & Heider, 1999; Reichheld & Teal, 2001), a customer brings to the organization the following values: access to basic profit; increase in operating income; reduction of operating costs; branding; expansion of high quality customer base; creating price advantage; the value of learning and innovation; and strategic value.

2.2.2 Value-chain theory

The first one to raise the value chain thinking is American scholar Michael Porter. Value chain describes how customer value is achieved through a series of activities that lead to a final product or service. Enterprise is a set of "a series of activities" designed to eventually meet customer needs, and an "output" of "a series of activities". Porter described value chain as "a set of activities" that a firm operates for the design, production, marketing, delivery and maintenance of their products." Porter also discussed: "An enterprise's value chain and its single activity engaged reflects its history, strategy, ways for implementation of strategy, and the fundamental economic interests of these activities" (Porter & Kramer, 2006). Value Chain management is the latest development of supply chain management. It incorporates customer relationship management, and adopts the basic idea of market and customer demand orientation. It takes the core business as a leader, aiming to improve competitiveness, market share, customer satisfaction and maximization of profits. Its operation model is based on collaborative commerce, collaborative competition, and win-win principle. Through the application of modern business management ideas and methods, information technology, network technology and integration technology, it achieves effective planning and control of the whole supply chain's information flow, logistics, capital flow, business flow, value flow and workflow. Thereby it connects the core business with customers, distributors, suppliers, service providers to form a complete chain network structure, and highly competitive strategic alliances. By creating value chain, competitive advantages can be achieved, featuring business alliances, cost leadership, differentiated management, and collective objectives.

Value Chain casts aside many deficiencies of the traditional management model, such as lack of cooperation, unstable supply and demand; low degree of utilization of resources; no sharing of demand information, serious distortions; core business' inability to accurately grasp customer needs, etc., and makes development and optimization in management thinking and models.

Value Chain Management has three meanings: First, there are close links between business activities, such as raw material supply plan, timeliness and coordination coherence are closely linked with manufacturing; Second, each activity can bring to the enterprise tangible and intangible value, such as service value chain, if an enterprise pay close attention to customer demands and after sales service, its credibility can be enhanced, and thus ensued with the intangible value; Third, Value Chain not only involves various chain activities within the enterprise, but more importantly, it also includes enterprise's external activities, such as relations with suppliers, and customers and the like.

The purpose of the value chain management is to maximize the value created by the entire chain. For any value chain, there is only one source of income: the customer. Customer is the only real cash inflow point in value chain, all other cash flow is only money exchange incurred in the value chain (assuming the organizations of the value chain are separate entities), the cash exchange increases the costs of value chain. In fact, all information, materials and capital flow in the value chain will incur costs. Therefore, the effective management of these flows is the key to the success of value chain. Value chain covers all operational activities between suppliers and customers from contract formation to the delivery of final product or service. Value chain includes not only manufacturers and parts / raw material suppliers, but also wholesaler / distributors, retailers and customers themselves. In an organization, value chain covers all functions to achieve customer needs, including new product development, procurement, production, distribution, finance and customer services etc. Value chain is dynamic; it contains information, products and capital flows between each organization of the value chain, which performs different processes, and interacts with other organizations of the value chain.

2.2.3 Total quality management theory

2.2.3.1 Definition of Total Quality Management (TQM)

General Electric's Quality Manager Feigenbaum described "Total Quality Control (TQC)" is a system for integrating the quality development, maintenance, and improvement efforts of the various groups in an organization so as to produce marketing, engineering, production, and service at the most economical levels for full customer satisfaction" (Feigenbaum, 2002). Feigenbaum first proposed the issue of quality system, and a brand-new thinking that the major task of quality management is to establish a quality system, which is of epoch-making significance in that statistical quality management period. Feigenbaum's TQC thinking quickly spread in Japan, the United States, Europe and many other countries, including China, and became richer and more developed along with its practice in various countries, and therefore it is very common to see the dissimilar or even very different versions of TQC in diversified countries or areas. ISO / TC176 reached a consensus after discussion and issued on April 1, 1994 the ISO8402 "Quality management and quality assurance - Terms", which defines Total Quality Management (TQM) as an Organization's management approach that is focused on quality, based upon full participation, aiming at long-term success with customer satisfaction and benefits to all members of the organization and the society. Some notes regarding this definition: (1) "full" refers to all departments and all levels of personnel in the organizational structure; (2) Top manager's strong and sustained leadership, as well as education and training for all members within the organization, are essential to the success of this approach; (3) In total quality management, the quality concept is connected with the realization of all the relevant management objectives; (4) "Social benefit" means that, when required, "social demands" can be met; and (5) Sometimes TQM, or part of it may be called as "total quality", "Company-wide quality control" (CWQC), "Total Quality Control (TQC) and the like.

2.2.3.2 Total Quality Management (TQM) Principles

TQM principles are based on the control of the whole process of quality formation, namely quality loop. Quality loop is a conceptual model affecting the quality interactions at all stages, from identifying the demands to assessing the fulfillment of these demands. Dr. Feigenbaum believes that, while providing a product or service to the satisfaction of customers, its quality is to be designed, manufactured, marketed and maintained at the most economical cost conditions. The achievement of this goal requires a wide range of company-wide system, since the quality of any products is affected by each work phase in the cycle of production activities, it is therefore necessary to develop an integrated and effective system covering all activities of each internal department of the enterprise in the development, maintenance and enhancement of quality. Dr. Feigenbaum divided the process of manufacturing activity cycle, and the generation, formation and realization of product quality into eight stages: (1) marketing, (2) planning, (3) procurement, (4) manufacturing, (5) process control, (6) field operations, (7) mechanical inspection, (8) functional testing, (9) shipping, (10) installation, and (11) after-sales services.

Despite the variations of the division of quality loop in different industries and products, the whole process of product quality formation should be included and subject to effective control.

The content and principles of total quality management have determined its characteristics as "3-W & 1-M", namely: whole staff, whole process, whole range and multi-methods quality management.

Chapter 3: Research Framework

Several concepts, such as patient perceived value, patient satisfaction, service quality, are fairly related to patient-centeredness. Patient-centeredness is also considered as one of the aims of healthcare quality improvement. In this chapter, the author first defined the concept of patient-centered clinical process. Then organize the core dimensions, antecedents, and outcomes into a framework based on Dr. Donabedian's health service model.

3.1 Overall research framework

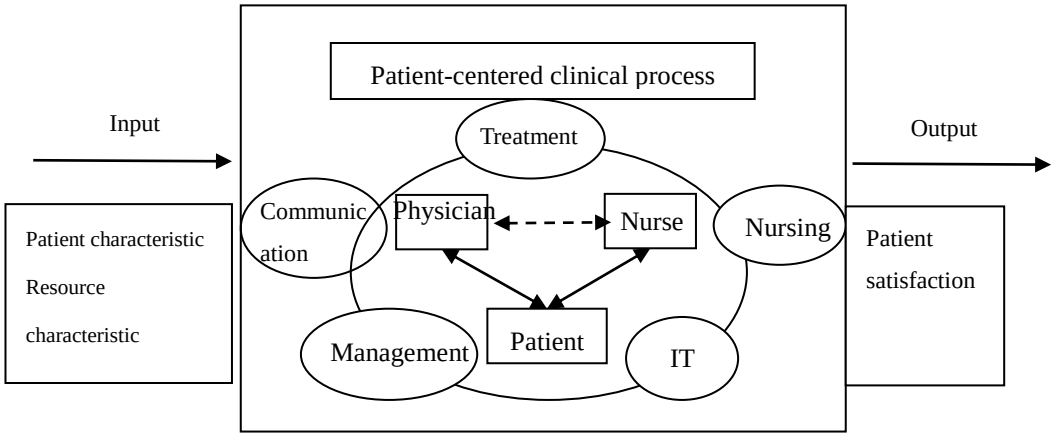
The overall framework of this study, as shown in Figure 3-1, is based on the aforementioned literature review and Dr. Donabedian's structure-process-outcome (SPO) model (Donabedian, 1966; Donabedian, 1985; Donabedian, 2005). In this case, patient-centered clinical process is defined as: a clinical process that contributes to a cooperative partnership between healthcare personnel, patients and their families, to ensure that clinical decisions can respect the patient's needs, ideas and wishes, and that the patients are entitled to have access to education and support needed in decision making, prompting patients to participate in clinical processes, so that they get a better perceived value and service experience.

In the original framework defined by Dr. Donabedian, structure refers to the resources available to the healthcare including organization and financing; the characteristics of the patients, service, or policy; and the physical, social, and economic environments in which the medical activities occur. Process refers to the implementation of the healthcare service, or policy. Outcomes refer to the expected results of implementation. Outcomes usually consist of short-term goals, such as the curation or alleviation of symptoms; longer term goals, such as change in quality of life, and social restoration.

In Figure 3-1, the environmental characteristics of the clinical processes for patients are considered as an input of the entire process, while the middle block represents the conformance degree of different dimensions of clinical processes with

patient perceived patient-centeredness, while the output selects patient satisfaction as a measurement index. The Core of patient-centered clinical process is the interactive and collaborative partnership of physicians, nurses, and patients, which can be expressed as a number of patient-perceived dimensions, including diagnosis and treatment, nursing, communication, management, information technology, etc.

Figure 3-1 The overall research framework



Source:The Author.

3.2 Dimensions of patient-centered clinical process

Through the analysis of previous literature, and interviews with physicians, nurses and patients, the patient-centered clinical process in this study contains dimensions of diagnosis and treatment, nursing, communication, management, information technology and other aspects. These dimensions are established for measuring the degree of patient-centeredness perceived by the patients.

3.2.1 Medical treatment and physician dimension

Medical treatment and physician dimension reflects the degree of patient-centeredness in each activity of the entire healthcare process, including partnerships, decision factors, treatment options, prevention programs, etc. Potential questions include the existence or absence of the following: (1) continuity throughout the treatment process; (2) physician's equal attitude and treatment of patients; (3) sufficient physician-patient communication; (4) patient's involvement in

the decision-making process; (5) satisfaction of patient's needs in decision-making process; (6) appropriate and reasonable provision of medical care; (7) diversified therapies diversity (systemic therapy); (8) medical team's involvement in the development of therapies; (9) public health awareness; and (10) preventive health care knowledge education for patients and their families.

3.2.2 Nursing and nurse dimension

Nursing and nurse dimension reflects the degree of patient-centeredness in each activity of the entire healthcare process, including nurse-patient relationship, nursing skills and other aspects. Potential questions include the existence or absence of the following: (1) explicit explanation of the patient status to patients and their families; (2) provision of good guidance and help to the patient; (3) accorded expectations with the patient; (4) respect, care and attention to the patient;(5) fast response to the patient needs; (6) standard operation procedures; (7) quick care; and (8) personalized care.

3.2.3 Patient dimension

Patient dimension reflects the availability of medical services, participation in medical treatment, and sharing decision-making in clinical process. Potential questions include (1) freedom of choice of physicians; (2) access to physician's medical quality information; (3) feasibility of immediate treatment; (4) access to physicians help even after work; (4) attentions for self-management; (5) actively participation in treatment programs discussion; (5) compliance to physician orders; (6) involvement in the decision-making process; and (7) trust in physicians.

3.2.4 Communication dimension

The communicate dimension reflects the degree of patient-centeredness in the clinical process with respect to the approaches, contents, environment, etc. of the communication between clinical staff (physicians and nurses) with patients. Potential questions include the existence or absence of the following: (1) earnest answers to patients' questions; (2) consideration of the patient's privacy; (3) Receptive Listening; (4) the patient's accurate understanding of the information; (5)

friendliness and control of negative emotions; (6) clear communication channels easily accessible to the patients; (7) adoption to the patient's language and habits; (8) disturbance or interruption of the communication process; (9) relaxed atmosphere of communication; and (10) compliance of all hospital staff with the above donations.

3.2.5 Management dimension

The management dimension reflects the degree of patient-centeredness in each aspect of the implementation of clinical process such as process arrangements, team building, environment configuration and cultural atmosphere, etc. Potential questions include the existence or absence of the following: (1) convenient and quick patient visits procedures; (2) Existence of multidisciplinary health care team; (3) hospital facility and environment conducive to the patients; (4) multidimensional evaluation of the hospital staff (5) hospital's implementation of publicity of patient-centered concepts and knowledge; (6) medical staff's proper understanding of patient-centeredness; and (7) surveys conducted over patient satisfaction.

3.2.6 Information dimension

The adoption and use of information and information technology provides a great impetus to patient-centeredness in clinical processes. The information dimension reflects the information security, privacy protection, and the degree of IT utilization in clinical processes. Potential questions include the existence or absence of the following: (1) assurance to protect the patient's privacy not to be leaked; (2) the ability to effectively reduce the incidence of medical malpractice; (3) regular system maintenance; (4) patient access to personal medical information via the Information System; (5) patient access to the information of medical personnel via the Information System; (6) patient access to self-management of disease via the Information System; (7) to what extent the Information System has shortened the time for patient visits?; and (8) Information System's support of decision-making.

3.3 Antecedents of patient-centered clinical process

3.3.1 Patient characteristics

Traditional medical model places the patient in a less knowledgeable, passive, and dependent role. Therefore, the patient has not been considered as an active element of the clinical process in most traditional health service evaluation models. On the contrary, patient-centered clinical process focus on the patient's needs, ideas, wishes, and encourage the patient's participation in the full process. The patient is not exogenous to value creation activities, and therefore should be not conceptualized as a destroyer or consumer of value. Patient's literacy, which can largely be profiled via patient's characteristics, is associated with patient's expectation, patient perceived value, and patient experience as well. These characteristics include the patient's age, sex and other demographic characteristics, work, education, treatment frequency, familiarity with the hospital, capacity of using computer, etc.

3.3.2 Resource Characteristics

It is the value creation environment, characterized by large amounts of various resources (such as information, available professional expertise, and infrastructure) that enable the performance of patient-centered clinical process. Considered as value creation chain, patient-centered clinical process has two primary emphases: the management of information, and material or resources. The resource characteristics include types of departments, the number of visits in each department, application of information technology (patient intelligent cards, EMR, etc.).

3.4 Outcomes of patient-centered clinical process

Although outcomes of healthcare seem fairly concrete, cautions have been raised about using them to measure the attributes of health service. Usually, there is a significant time lag between the clinical process and recognition of the outcome. Furthermore, some issues regarding outcome assessment are difficult to resolve, such as how to collect sufficient information on survival or functional restoration,

and who account for the bad or good quality of services. In addition, most patients are lacking of sufficient expertise and skills to assess whether their received medical service was performed appropriately or was even necessary.

In this study, patient satisfaction is used as an outcome variable of patient-centered clinical processes. In the perspectives from patient satisfaction, patient-centeredness can be defined as the extent to which patients judge the overall hospital experience favorably and would return for a future visit. Patient satisfaction is fundamental to the practice of patient sovereignty. For health care providers, patient satisfaction leads to favorable results, such as higher rates of patient retention, positive word of mouth and higher profits. Patient satisfaction also influences the rate of patient compliance with physician advice and requests. Satisfaction actually affects the outcome of clinical process. In our study, patient satisfaction includes overall satisfaction, and the patient's specific satisfaction with the diagnosis and treatment, care, communication, management, and information in clinical processes.

Chapter 4: Research Methods

Data were collected via a hospital survey following item generation, presetting, and the Q-sort pilot test. The purpose of the hospital survey was to collect data useful for the validation of the framework developed, as described in Chapter 3, as well as to test to answer the research questions. Chapter 4 describes the research methodology employed in the hospital survey and discusses the validity and reliability testing of the measurement models of the variables under study.

4.1 Overview of Yuebei People's Hospital

Located in Shaoguan City, Guangdong Province, formerly known as the People's Hospital in Shaoguan District, Yuebei People's Hospital is currently affiliated to Shantou University Medical College. Formerly it was a British Christian Church Methodist Hospital, founded in 1886, with 119 years of history so far. In northern Guangdong, it is the largest and best equipped comprehensive hospital with the most advanced technology, integrating medicine, teaching and research. In Shaoguan District, it is the only state-owned Class A tertiary hospital (top rank in the classifications of tertiary hospitals) shouldering the tasks of medical treatment, teaching, scientific research, healthcare, rehabilitation, and guidance over the city's health work.

The Hospital has 2,500 authorized beds, and 3200 open beds. In 2014, discharged patients amounted to 97,700, accounting for over 50% of total discharged patients in medical institutions directly under the city of Shaoguan. Annual surgical volume reached 54,000 person-times. The Hospital currently has 2904 employees, including 2305 professional and technical personnel, 12 postgraduate tutor, 330 chief physician and other staff with senior titles, 537 attending physicians; and other staff with intermediate titles; 32 PhDs, and 297 Masters.

Enjoying a leading position in North Guangdong in terms of overall strength and various specialist diagnosis and treatment technologies, the Hospital has a total of 47 clinical and medico-technical departments. The Departments of

Cardiovasology, Hematology, Neurology, Endocrinology, Gynecology, Neurosurgery, Hepatobiliary Surgery, Gastrointestinal Surgery, Head Neck Breast Surgery, Pediatric Surgery, Clinical Laboratory, Renal Medicine, Gastroenterology, Cardiothoracic Surgery, Burns & Plastic Surgery, Obstetrics and Neonatology are key clinical specialist departments in Guangdong Province. The Anorectal Department is among the key specialist departments of Traditional Chinese Medicine (TCM) Construction in Guangdong Province, and the Department of Pediatrics is among the key specialist departments of the Five-Top Project of Guangdong Province, with advanced province-leading diagnosis and treatment level. The Hospital also has a substantial number of specialized and key specialist departments, coupled with other unique departments. They have achieved a balanced development, and created strong scale and technological advantages. The Department of Cardiovasology, featuring in advanced and mature cardiac intervention, has an annual admission over 6,000 person-time and annual interventional procedures over 2,000 operations. The Cancer Center, consisting of the departments of Oncology, Interventional Therapy, Oncology Surgery, Radiation Therapy and other specialist departments, has achieved systematic, standardized and comprehensive treatment of cancer. It is the second hospital in Guangdong province that simultaneously has the international advanced level of Positron Emission Tomography-Computed tomography (PET-CT), linear accelerator, neutron knife, gamma knife and other equipment for diagnosis and treatment, cancer prevention and treatment level enjoys a high reputation in Shaoguan City and northern Guangdong. The Hospital has maintained significant technical characteristics and advantages in the diagnosis and treatment, and diagnostic imaging of extraordinarily large area burn, bone and joint diseases, micro trauma surgery, heart and blood vessels and other complex cardiothoracic surgery, comprehensive treatment of kidney disease, blood diseases, neurological rehabilitation, bone marrow transplantation, complex hepatobiliary surgery, complicated hemorrhoids, obstetrics and gynecological diseases, etc. The Hospital has the only Hospice Hospital donated

by the Li KaShing Foundation in northern Guangdong to provide free home hospice services for poverty-stricken patients with terminal cancer.

The Hospital has a total equipment worth of 340 million yuan, the overall configuration of equipment outpaces hospitals at the same level in the province. The Hospital has South China's first PET / CT-64 (US GE) and tumor radiofrequency ablation knife, three 1.5T MRI (Geman Siemens, US GE), four sets of CT including the 128-slice CT (US GE), DSA (US GE), ECT and a number of high-tech, precise and top-notch medical equipment. The Hospital management has been digitalized with comprehensive, high-level information technology, covering the Hospital Information System (HIS system), picture archiving and communication system (PACS), laboratory information system (LIS) and office automation (OA), which are running smoothly and effectively. The Hospital opened China's first WeChat whole process hospital information platform, which can accomplish the appointment, registration, payment, out-of-hospital waiting, access to the examination and test results, and other processes. The Hospital also introduced appointment-based registration via telephone, Internet, mobile phones, etc.; self-inquiry of examination and test results via telephone, Internet, SMS; and other services for convenience and benefits of the people. Overall, the reliance on modern information technology has powerfully improved the quality and efficiency of hospital’s services.

4.2 Literature retrieving and review

Through literature and policy review, comparison and analysis of patient-centered concepts are made to further define the concept of patient-centered clinical process, determine its core dimensions, and form the conceptual framework of this study. Based on the literature analysis, an index set is formed to evaluate the different dimensions of patient-centered clinical process, and determine the various influence factors related to the patient-centered clinical process.

4.2.1 Search strategy

This Study selected PubMed and CBM electronic database for a more systematic retrieval of papers related to this topic in default number of years in the

databases. Search terms are: patient-centered, patient-centeredness, indicator, target, norm, index, nursing care, nursing, nurse, treatment, hospital management, hospital administrator, communication, information system, hospital information system, information management system, information technology, diagnose, diagnosis, diagnosis and treat, measurement, evaluation, measure, evaluation, assessment, valuation and corresponding Chinese search terms. In addition, the references of some articles are also included as relevant literature into the retrieval range.

4.2.2 Selection Criteria

A total of 331 papers were retrieved, based on the selection of papers related to the measurement and evaluation of patient-centeredness, or a dimension of it, and relevant suggestions and measures for improvement, specific implementation and the like. After further screening, 30 papers with high correlation of the evaluation of "patient-centered" clinical process evaluation were selected.

4.3 Interviews

4.3.1 Purpose of interviews

A certain number of physicians, nurses, patients were selected for interview, the purpose of which is: firstly, to further understand and investigates the actual situation of the hospital's clinical process; secondly, get access to the dimensions of patient-centered clinical process, as perceived by physicians, nurses, patients and other related groups, to further develop the measurement index of the research framework.

4.3.2 Interview methods and protocol

4.3.2.1 Select Interviewees

The Interviewees are Yuebei People’s Hospital's healthcare workers: physicians and nurses who are required to have more than two years' service in the Hospital; and patients, who are required to have more than ten years' patient visits experience in Yuebei People’s Hospital.

Six physicians were selected, including two physicians each with senior, intermediate, and junior titles, respectively. 12 nurses were selected, including six

inpatient nurses and six outpatient nurses; four nurses each with senior, intermediate, and junior titles, respectively. A total of 12 patients were selected.

The Interviewees were randomly selected in qualified population, on a voluntary basis. Interviewees were informed of the purpose and nature of the study and privacy protection means for information provided by them.

4.3.2.2 Interview Manner

The venue for Interview was in Conference Room, F8, Yuebei People's Hospital. A group member of the Study performed vis-a-vis interviews for all interviewees. The contents of the interviews were recorded.

4.3.2.3. Interview Analysis method

Content Analysis method was adopted to analyze the information collected from Interviews.

4.4 Questionnaire development

4.4.1 Initial dimensions and items from the literature

Table 4-1 shows the proposed "patient-centered" clinical process evaluation framework based on literature review.

(1) Medical dimensions: including the physician-patient relationship, treatment decisions, treatment methods and prevention of four sub-dimensions, in accordance with sub-dimensions presented 10 evaluation indicators.

(2) Care dimensions: including nurse-patient relationship and care skills two sub-dimensions, made eight evaluation index based on sub-dimensions.

(3) Patient dimensions: including medical services availability, treatment participation and joint decision-making process such as the right three sub-dimensions, made nine evaluation index based on sub-dimensions.

(4) Communication dimension: includes three sub-dimensions of communication content, communication and communication environment, made 10 evaluation index based on sub-dimensions.

(5) Management dimensions: including service process, service team, the hospital environment and values of four sub-dimensions, according to sub-dimensions proposed seven evaluation indicators.

(6) Information system dimensions: including security and privacy, information system utilization two sub-dimensions, made eight evaluation index based on sub-dimensions.

Table 4-1 "patient-centered" clinical process evaluation framework model

Dimension	Sub-Dimension	Index/question	Source
Medical dimension	Partnerships	Continuity throughout the treatment process	Annemarie et al., 2012
		Physician's equal attitude and treatment of patients	KDavis et al., 2005
		Sufficient physician-patient communication	Bertakis amd Azari, 2011
		Patient's involvement in the decision-making process	Fineberg, 2012
		Satisfaction of patient's needs in decision-making process	Maizes et al., 2009
		Appropriate and reasonable provision of medical care	
	Decision factors	Diversified therapies (systemic therapy)	
		Medical team's involvement in the development of therapies	
		Public health awareness (for the physician)	
	Treatment options	Preventive health care knowledge education for patients and their families	
	Prevention programs		
Nursing Dimension	Nurse-patient	Explicit explanation of the patient status to patients and their families	Laschinger,et al., 2005
		Provision of good guidance and help to the patient	Bergvik et al., 2008
		Accorded expectations with the patient	
		Respect, care and attention to the patient	
		Fast response to the patient needs	
		Standard operation procedures	
	Skills	Quick care	
		Personalized care	
Patient Dimension	Easy access to medical services	Freedom of choice of physicians	Nutting et al., 2010
		Access to physician's medical quality Information while choosing a physician	Collaborative, 2010
		Feasibility of immediate treatment	Epstein et al., 2005
		Access to physicians help even after work	Martinez et al., 2009
	Participation in the diagnosis and treatment process	Attentions for health self-management	Davis et al., 2005
		Actively participation in treatment Programs discussion compliance to Physician Orders	Mead et al., 2000
	Co-decision-making	Involvement in the decision-making process	
		Trust in physicians	

Communicati on Dimension	Contents	Earnest answers to patients' questions	Gremigni et al., 2007
		Consideration of the patient's privacy	Maguire and Pitceathly., 2002
		Receptive Listening	Davis et al., 2005
		The patient's accurate understanding of the information	Epstein et al., 2005
		Friendliness and control of negative emotions	Fallowfield and Lewis, 1996
		Clear communication channels easily accessible to the patients	Littleet al., 2001
		Adaption to the patient's language and habits	Marvel et al., 1999
	Approaches	Disturbance or interruption of the communication process	
	Environment	Relaxed atmosphere of communication compliance of all hospital staff with the above requirements	
Management Dimensions	Process	Convenient and quick patient visits procedures	Davis et al., 2005
	team	Existence of multidisciplinary health care team	Toop, 1998
	environment	Hospital facility and environment conducive to the patients	Epstein et al., 2005
	value outlook	Multidimensional evaluation of the hospital staff (for medical personnel)	Committee on Quality of Health Care in America, 2001
		Hospital's implementation of Publicity of patient-centered concepts and knowledge	
		Medical staff's proper understanding of patient-centeredness	
		Surveys conducted over patient satisfaction	
Information Dimensions	Security and privacy	Assurance to protect the patient's privacy (healthcare information) not to be leaked	Davis et al., 2005
		Ability to effectively reduce the incidence of medical malpractice	Caligtanet al., 2012
		Regular system maintenance	Bates and Gawande, 2003
		Patient access to personal medical information via the Information System	Bates and Bitton, 2010
		Patient access to the information of medical personnel via the Information System	
	Utilization rate	Patient access to self-management of disease via the Information System	
		To what extent the Information System has shortened the time for patient visits	
		Information System's support of decision-making	

Source: The Author.

4.4.2 Interviews

In order to verify the initial dimensions and index obtained from the literature, as well as some potential measurement index not yet been reported, the author performed face to face interviews with physicians, nurses and patients. The results of interviews showed that the selected dimensions and initial indicators can better reflect the degree of patient-centeredness in clinical processes.

4.4.3 Q-sorting procedures (methods, participants, results)

The author conducted the Q-sort method for instrument validity. The Q-sort method is an iterative process that one can place each question into particular constructs, assessing construct validity and finding improvement of measurement. The initial instruments were adapted from literature in healthcare process, healthcare outcomes, and information system aspects, tested with two researchers to ensure comprehensibility. By applying the Q-sort method, the author assessed the instrument and gained insight of construct validity of measurement items.

For this study, total four rounds were conducted; the first three rounds were for finding improvements to the questionnaire, and the last round was for testing the questionnaire. In order to find rooms for improvements, readers were asked to provide feedback about the clarity of the questions and comments to improve the questionnaire. First, a reader was briefed with a standard set of definitions of constructs, and sorted the questionnaire items into construct categories. Each item was printed on an index card, and the cards were shuffled into random order for presentation to the reader. During sorting, the readers were encouraged to ask questions and leave comments. After sorting was done, the author interviewed with the readers to ask why the readers put some items to specific constructs when detecting incorrect placement of the items. Based on the feedback, items were modified or discarded to strengthen the construct validity. To test the instrument, the author wanted to recruit experts considered as knowledgeable and experienced in the areas because the author found that having expertise in context and constructs influenced on the result of the Q-sort. However, it was difficult to find an

appropriate person who has expertise in all three areas. Therefore, the author invited three Ph.D. students majoring in healthcare information systems for the last round, allowing them to discuss the meanings of the items and place the cards. This approach is good to capture cognitive information processing. It apparently shows their logic to place cards into specific construct. Through this approach, the author was sure that their knowledge were complemented each other to make expert-like decisions. The author found that mistakes or bias-based choices made by one of the team were corrected easily by discussion among them.

Scales based on categories, which have a high degree of correct placement of items within them, can be considered to have a high degree of construct validity. The readers in the first two rounds told many items can be put two categories or a "cannot decide" category is needed for items that the reader did not force into a particular category. However, the result of the last round of the Q-sort method had only six items went to incorrect categories, and some of those items were modified. 19 constructs, such as "Digital Connection", "Coordinated / Integrated Care", "Patient Access to Care", "Environment Dynamics", "Hospital Leadership", and "IT-Business Alignment", obtained a 100% item placement ratio, indicating a high degree of construct validity. Correct placement ratio is 96% (= 133/139), which degree is relatively high compared to that of one person.

The Final Questionnaire includes 88 evaluation items, of which 66 items are distributed in the main dimensions measuring patient-centered clinical process, including 28 evaluation items for physicians dimension, 14 for nurses dimension, 15 for patient dimension, and nine for clinical process Dimension; 22 items are distributed in the outcome evaluation of patient-centered clinical process, including 10 evaluation items for patient clinical process, and 12 for HIS' impact on clinical process. The scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order.

4.4.4 Pretest of questionnaire through interviews

Before formal beginning of the interview, the author selected 20 each of the physicians, nurses, and patients, respectively, for pre-survey, through which the author found seven problems of the questionnaire including illogical expression, ambiguous language, inability to obtain valid information, etc., and four textual errors. As per the views of interviewees, the author has corrected these errors.

4.4.5 Translation validation (English to Chinese, Chinese back to English)

Given that the measurement items in this study are mostly derived from literatures in English. The author employed two PhDs of Chinese nationality from the Business School, International University of Florida, USA, to translate the English questionnaire into Chinese, and then Chinese into English, and so forth for two rounds, to ensure that, eventually, the measurement items in two languages can reach semantic equivalence.

4.5 Sampling procedures

4.5.1 Criteria for selecting respondents

The Patients participating in the survey should be on a voluntary basis, and at least received a complete outpatient or inpatient medical service, or are receiving inpatient medical services, in Yuebei People's Hospital.

4.5.2 Sampling procedures

The author used a convenience sampling method to obtain a sample of 450 patients. A total of 450 questionnaires were distributed to them. Finally the author recovered 415 valid questionnaires.

4.6 Survey data collection procedures

4.6.1 Survey Methods

Superintended by the hospital leaders, comprehensively sponsored by the Office of Party and Government Affairs, and coordinated by the Medical Administration Department, Nursing Department, Human Resources Department, Outpatient Office, Quality Management Department and related business

departments and offices, the Questionnaire Survey was conducted by two investigation team composed of Student Interns of the Hospital after unified training. The Investigators actively informed the respondents of the purpose of the survey to dispel their misgivings; and timely answered the respondents' questions to clear their doubts without interference with the views of respondents. Additionally, the Investigators made no comments on the contents of the Survey so as to improve the validity and reliability of the questionnaire.

4.6.2 Survey Quality Control

Prior to the survey, Investigators were subject to unified training with explanation of the contents, significance and form-filling requirements of the questionnaire. Investigators were required to explicate the purpose and significance of this survey to the respondents. The Survey was not conducted on the basis of the respondents' trust and cooperation. Attentions were paid on the examination of the returned questionnaires, those with missing items accounting for 20% and above were deemed as invalid.

4.7 Data analysis methods

4.7.1 Data entry and inspection

Data entry into the SPSS database was performed by personnel participated in the study. And the data was double-checked to ensure validity.

4.7.2 The data preprocessing

SPSS software was used to detect data quality and distribution, and delve into the following:

(1) Outliers

(2) Deviation

(3) Data Distribution

4.7.3 Reliability and validity

Factor analysis was used to analyze the validity and reliability of the questionnaire. Factor analysis is the description of the relations between plenty of indicators or factors via the use of a small number of factors, in this study,

specifically, it is to find the common factor between the correlated indicators; it is mainly used to reduce the number of analysis variables and classify the original variables according to their relevance.

Confirmatory factor analysis was used to verify that each sub-dimension can truly reflect the various dimensions, and the various indicators of sub-dimensions can truly reflect these sub-dimensions.

4.7.4 Statistical modeling

In this study, the following statistical modeling techniques were used:

(1) Descriptive Statistical analysis: rate, ratio, mean, and standard deviation of key indicators;

(2) Univariate analysis: Chi-square test, t test, analysis of variance, etc.;

(3) Multivariate statistical model: Modeling upon multivariate linear regression or logistic regression.

Chapter 5: Data Analysis Results

This chapter describes the major results based on analytic framework illustrated in Chapter 4. The author first present the case study results, focusing on the key different attributes between traditional and patient-clinical process, and the impact of patient-centered clinical process on patient outcomes as well. Then the author present the results from survey data analysis to show how different patient-centered clinical process dimensions affect patient-based outcomes and identify the key antecedents that determine the patient-centered clinical process.

5.1 Case interview results

5.1.1 Key differences between traditional and patient-centered clinical processes

The results of Interview show that, patient-centered clinical process, as compared with the traditional clinical process, has the following characteristics:

5.1.1.1 Patient-perceived convenience in visits and treatment.

The convenience is manifested primarily in curtailed waiting time in the diagnosis & treatment process of registration, payment, access to laboratory results & reports, treatment and the like. A physician interviewee said: "Now the process is much simpler than it used to, you can register via the machines and WeChat with less queuing. Previously the author physicians prescribe on hand, the author wrote a lot; and patients had to run back and forth, up and down for prescription and drugs; now these procedures have been boiled down to much simpler process, dispensary is also a lot faster. "

5.1.1.2 More fully physician-patient & nurse-patient communication

Physician interviewee believed that "this does not rely on the system, real communication depends on the physician’s time, if the physician is very busy, and there can be no real communication at all."

The embedding of abundant advanced communication and information technology has rendered medical processes to be more intelligent, leading to two

results: on the one hand, thanks to EMR system, physicians can understand more fully the patient's situation; on the other hand, enhanced diagnosis & treatment efficiency has enabled relatively prolonged physician-patient & nurse-patient communication, while ameliorated communication prompts more patient involvement in clinical process.

5.1.1.3 Enhanced continuity of medical services

With social media platforms such as WeChat, the patient can be effectively tracked and followed-up after discharge. At the same time, the patients have the opportunity to consult, at home, with their own physicians on diseases and health problems.

5.1.2 Key impacts of patient-centered clinical processes on patient-based outcomes

5.1.2.1 Patient experience and perception

Physician Interviewee: "The more time you spend on a patient, the better his attitude, that's for sure. In the past, there was no registration queuing & calling system, everybody squeezed ahead in the crowd to get his medical record paper placed. There was no order at all, now it is much better. "

Patient Interviewee: "It is a lot easier, no lining up, the use of electronic medical records saves a lot of trouble, no begging for archived medical records as in the past."

The vast majority of physicians, nurses and patients that the new processes with improved patient experience, patient satisfaction is greatly enhanced.

5.1.2.2 Diagnosis & treatment results

Physicians and nurses surveyed believe that patient-centered clinical process helps to reduce errors, improve quality, thereby improving treatment outcomes.

Physician interviewee: "The more understanding of patient's medical, the less the misdiagnosis and missed-diagnosis, this certainly improves the cure rate, thereby not only improving patient satisfaction, but also reducing the time for diagnosis,

without EMR, the patients may well miss you blind questions, nor can they tell you the whole medical history. "

Nurse Interviewee: "The use of ambulatory carts saves our time for the patients; it is easy to operate at the bedside. During morning and evening care, once you find out the patient is in a coma, the author can have emergency response promptly, but if only the computer speed can be a little faster. "

5.1.3 Key antecedents of patient-centered clinical processes

The interviewees believe that the main factors affecting patient-centered clinical processes include: national policy environment; clinical diagnosis & treatment facilities; clinical skills and experience; and the adoption of information technology. Almost all health care workers believe that the use of information technology has promoted the implementation of patient-centered clinical processes.

Physician interviewee: "information technology developed, the author is all networked, and become much faster, once the prescription is made, the dispensary will get the message, and the patient will get his drugs. At the same time, computers become more popular, system software is better developed, and people tend to use computers more and more."

5.2 Survey data analysis results

5.2.1 Sample descriptive statistics

In the Survey, a total of 450 questionnaires were distributed, and 405 copies recovered as valid, the validity rate was 90%. Basic information for respondents include: gender, occupation, professional title, education, number of hospital visits, number of department visits, frequency of computer use.

Table 5-1 Sample Characteristics

Category	Number	Percentage (%)
Gender		
Male	206	50.9
Female	199	49.1
Occupation		
Government employees	36	8.9
Enterprise employees	67	16.5
Individual industrial and commercial households	37	9.1
Farmers	140	34.6
Others	125	30.9
Professional title		
Junior	58	14.3
Intermediate	62	15.3
Secondary senior	8	2.0
Senior	16	4.0
Unrated	203	50.1
Omissions	58	14.3
Education background		
Masters	4	1.0
Undergraduates	33	8.1
Diploma of junior-college	46	11.4
Diploma of polytechnic school	68	16.8
Others	254	62.7
Frequency of hospital visits		
1	180	44.4
2	98	24.2
3	39	9.6
4	88	21.7
Clinical visits in a specific Dept. or section		
1	255	63.0
2	77	19.0
3	23	5.7
4	50	12.3
Computer-use frequency		
At least once a day	102	25.2
At least once a week	30	7.4
At least once a month	18	4.4
Do not use computers	255	63.0

Source: The Author.

From the perspective of respondents' gender, there are 206 males, accounting for 50.9%; and 199 females, accounting for 49.1%.

From the perspective of respondents' occupational distribution, there are 36 government employees, accounting for 8.9%; 67 enterprise employees, accounting for 16.5%; 37 individual industrial and commercial self-employed people, accounting for 9.1%; 140 farmers, accounting for 34.6%; and 125 other people, accounting for 30.9%.

From the perspective of respondents' professional title distribution, there are 58 people with Junior titles, accounting for 14.3%; 62 with intermediate titles, accounting for 15,3%; 8 with secondary senior titles, accounting for 2%; 16 with senior titles, accounting for 4%; 203 with unrated titles, accounting for 50.1%; and 58 omissions, accounting for 14.3%.

From the perspective of respondents' Education distribution, there are 4 Masters, accounting for 1%; 33 undergraduates, accounting for 8.1%; 46 people with diploma of junior-college, accounting for 11.4%; 68 with diploma of polytechnic school , accounting for 16.8%; and 254 other people, accounting for 62.7%.

From the perspective of respondents' Hospital clinical visits' frequency distribution, 180 people are for the first visit, hospital, accounting for 44.4%; 98 for the second visit, accounting for 24.2%; 39 for the third visit, accounting for 9.6%; and 88 for the fourth visit, accounting for 21.7%.

From the perspective of frequency distribution of respondents' clinical visits in a specific Dept. or section, 255 people are for the first visit, accounting for 63%; 77 for the second visit, accounting for 19%; 23 for the third visit, accounting for 5.7%; and 50 for the fourth visit, accounting for 12.3%.

From the perspective of respondents' computer-use frequency distribution, 102 people use computer at least once a day, accounting for 25.2%; 30 once a week at least, accounting for 7.4%; 18 once per month at least, accounting for 4.4%; and 255 people indo not use computers, accounting for 63%.

5.2.2 Measurement validation

5.2.2.1 Content validity using interviews

Validity (validity) usually refers to the effectiveness and correctness of the questionnaire, i.e., the degree to which the questionnaire measures what it claims to measure. In designing the questionnaire, in addition to examining the reliability index of the questionnaire, the validity of the questionnaire should also be examined. Validity is the most important feature in a questionnaire survey, the purpose of which is to obtain measurement items and conclusions with high validity, the higher the validity, the higher the fidelity of the survey results to the behaviors to be tested, and the closer to achieve the purpose of the questionnaire test, thus the questionnaire can be correct and effective.

The Evaluation items in questionnaires of this study are based on the collection and repeated revisions of materials from "patient-centered" healthcare-related research, in-depth personal interviews, and symposiums at home and abroad. After the questionnaire is made, the author invited the relevant experts to conduct feasibility studies and pre-test measurement,

5.2.2.2 Convergent and discriminant validity using factor analysis method

When KMO value is greater than 0.8, it can be considered that the scale measurement range and content meet the measurement needs, with high reliability.

5.2.2.3 Reliability testing using Cronbach's Alpha

Reliability, namely, dependability, refers to the degree of consistency of the results using the same method on the same object after repeated measurement items. Reliability tests are important indicators for standardized questionnaire, reliability testing methods used in this study is Cronbach α-coefficient, and the results showed that the total scale Cronbach α coefficient is above 0.9, with high reliability.

5.2.3 The evaluation results of main dimensions in patient-centered clinical process

5.2.3.1 Physician's dimension evaluation results

Physician's dimensions corresponds to 28 evaluation items, the scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-2 Physician's dimension evaluation results

Evaluation items	Mean Score	Variance
Physicians fully understand all patients' medical history	6.24	1.142
Physician fully understand patients' health care needs	6.04	1.198
Physician concern how patient's health condition affect their personal life (E.g. family relationship)	5.90	1.385
Physician spend time to talk about patient's anxiety /phobia which caused by their health problems	5.71	1.652
Physician will ask about the patient's options of treatment voluntarily.	6.17	1.300
Physician has compassion of patient's feeling	6.29	1.063
Physician show respect, care and attention to patients	6.40	.995
Physician can respond to needs of patient quickly	6.27	1.133
Physician treats patients with an attitude of equal respect	6.42	.984
Physician in the clinic is not pushing patient, and each patient will have enough time to think or make decisions	6.39	.995
Physician can adapt in the way of patient's communication	6.35	1.029
Physician can properly handle patient's negative emotion	6.18	1.129
Physician could explain clearly to patient about all matters of diagnosis and treatment	6.24	1.172
Physician concern how patient's health condition affect their daily routines (such as self-care, work)	5.98	1.322
Patients can always understand physician's explanation about the diagnosis and treatment accurately	6.14	1.216
Physician encourage patients to ask questions	5.75	1.569
Physician will consider the patient's health information privacy	6.19	1.107
Physician listens carefully to the patient's concern	6.35	1.079
Communication between physician and patient is very receptive by patient	6.34	1.075
Physician answer patient questions seriously	6.40	.984
Physician can let patients feel relax and comfortable when talking about new signs and symptoms	6.24	1.158
While prescribing, physician will consider factors other than the patient's disease (such as psychological and daily routine)	6.13	1.177
Physician involve patient in the decision-making process voluntarily	5.91	1.444
Before the meeting, the physician will fully prepare the specific treatment-related agenda for patent	5.99	1.472
Physician emphasize importance of disease prevention for patients (Community Health)	6.01	1.414
Physician will spend time to explain how to prevent disease and reduce risk factors.	5.97	1.507
Physician will provide knowledge that improve quality of life for patient	5.92	1.519
Physician will suggest patient to change their unhealthy habits (such as diet or exercise), in order to promote healthier lifestyle	6.12	1.411

Source: The Author.

Survey results show that maximum score of evaluation items is 6.42, the evaluation item is "Physician treats patients with an attitude of equal respect", its variance is 0.984; the minimum is 5.71, the evaluation items is "Physician-patient discussion on patient's anxiety /phobia caused by their health problems", its variance is 1.652; the minimum variance is 0.984, and the maximum is 1.652, the smaller the variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

5.2.3.2 Nurses dimension evaluation results

Nurses dimension corresponds to 14 evaluation items, the scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-3 Nurses dimension evaluation results

Evaluation items	Mean Score	Variance
Nurse could clearly explain patient's situation to patient and their families	6.23	1.232
Nurse could give patient good guidance and assistance	6.35	1.007
Nurse can understand the patient's emotion	6.38	1.059
Nurse and patient share same expectations	6.33	.974
Nurse showing respect, care and attention to patient	6.42	.885
Nurse can respond to needs of patient quickly	6.30	1.023
Nurse can adapt in the way of patient's communication	6.37	1.013
Nurse can properly handle patient's negative emotion	6.18	1.162
Nurse encourage patients to ask questions	5.88	1.435
Nurse listen carefully to the patient concern	6.20	1.213
Nurse will consider the patient's health information privacy	6.22	1.171
Nurse answer patient questions seriously	6.36	.984
communication between nurse and patient is very receptive by patient	6.41	.912
nurse operate quickly	6.30	1.105

Source: The Author.

Survey results show that maximum score of evaluation items is 6.42, the evaluation item is "Nurse showing respect, care and attention to patient", the variance is 0.885; the minimum is 5.88, the evaluation item is "Nurses encourage patients to ask questions," its variance is 1.435; the minimum variance is 0.885 and the maximum is 1.435, the smaller variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

5.2.3.3 Patient dimensions survey results

Evaluation of patient dimensions corresponds to 15 items, the scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-4 Patient dimension evaluation results

Evaluation items	Mean Score	Variance
I can choose my favorite physician	5.76	1.721
I can schedule appointment as needed on the day	5.63	1.784
I can make appointment through the internet	4.71	2.274
I can still get the help after physician’s office hour.	5.42	1.908
I can view my medical records through the Internet	4.55	2.385
When choosing a physician, I can preview the evaluation of each physician	5.31	1.942
I can participated voluntarily to discuss the treatment options with physician	5.55	1.790
I will seek other information related to their health voluntarily	5.82	1.695
I voluntarily participate to learn about prophylactic treatment information	5.72	1.754
I can follow up and complete all the needed treatment after discharge.	6.36	1.016
I can cooperate and help physician to diagnosis their health condition	6.38	1.026
I can participate in the decision making process related to their treatment	5.94	1.423
I insist once or more health screen annually	5.04	2.261
I trust physician’s diagnosis	6.36	1.021
I trust physician’s professional standard	6.42	.981

Source: The Author.

Survey results show that maximum score of evaluation items is 6.42, the evaluation item is "I trust the physician's professional level in dealing with the diagnosis & treatment of patients, ", the variance is 0.981; the minimum score is 4.55, the evaluation item is "I can view my medical records through the Internet",

the variance is 2.385; the minimum variance is 0.981 and the maximum is 2.385, the smaller the variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

5.2.3.4 Evaluation results of clinical process Dimensions

Medical procedure dimensions correspond to nine evaluation items, the scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-5 Evaluation results of clinical process dimensions

Evaluation items	Mean Score	Variance
Patient registration in the hospital is easy	5.72	1.594
The signal of floors and units are clear, patients can easily find the unit that they need to go	6.43	1.040
The hospital's environment and facilities are very beneficial to patients, which can reduce the patient's phobia in the hospital	6.19	1.123
Restroom maintain good hygiene, patient feels comfortable	5.95	1.397
It is convenient for patient to meet with physician	5.95	1.267
There is no stop during the meeting	6.14	1.129
The hospital's communicate atmosphere is very relaxed	6.30	1.064
The diagnosis and treatment provided by the hospital is suitable and appropriate	6.19	1.120
The hospital provides diversified therapies (systemic therapy) to the patient	6.02	1.284

Source: The Author.

Survey results show that maximum score of evaluation items is 6.43, the evaluation item is "The signal of floors and units are clear, patients can easily find the unit that they need to go", the variance is 1.04; the minimum score is 5.72, the evaluation item is " In our hospital, patients can easily ", the variance is 1.594; the minimum variance is 1.04, and the maximum is 1.594, the smaller the variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

5.2.3.5 Evaluation results of Dimensions of patient-centered clinical process

Dimensions of Patient-centered clinical process correspond to 10 evaluation items, the scoring adopted 7-point method, with a minimum of 1 point (strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-6 Evaluation results of dimensions of patient-centered clinical process

Evaluation items	Mean Score	Variance
The hospital provide the necessary information to patients and their families to keep them participating in the treatment process	5.92	1.433
The hospital do home visit based on the patient's preference	5.62	1.682
Patient and their families complain about the slow response of physicians	3.62	2.400
Patient and their families complain about the slow response of nurses.	3.72	2.438
The hospital provide targeted self-education resources (such as self-management of body weight, provide education materials about overweight, dietary advice and exercise programs	5.60	1.764
I will insist on insist on medical advice in diet, exercise, medication, and self-screening	6.39	1.049
Overall, I am satisfied with the treatment and care in the hospital.	6.35	.917
Overall, I am satisfied with physician's attitude	6.42	.905
Overall, I am satisfied with physician's quality	6.36	.916
Overall, I am satisfied with the waiting time before meeting physician	6.04	1.291

Source: The Author.

Survey results show that maximum score of evaluation items is 6.42, the evaluation item is "Overall, I am very satisfied with physician's attitude", the variance is 0.905; the minimum score is 3.62, the evaluation item is "Patient and their families complain about the slow response of physicians", its variance is 2.4; minimum variance is 0.905 and the maximum is 2.438, the smaller the variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

Dimensions of HIS technology's impact on clinical process correspond to 12 evaluation items, the scoring adopted 7-point method, with a minimum of 1 point

(strongly disagreed), to a maximum of 7 points (Strongly Agreed), in ascending order. The evaluation results are as follows:

Table 5-7 Evaluation results of Dimensions of HIS technology's impact on clinical process

Evaluation items	Mean Score	Variance
Applied information technology changed the way physician treat patient	6.09	1.155
Applied information technology changed the way physician make prescription	6.07	1.136
Applied information technology improved efficiency of clinic	6.13	1.053
Applied information technology improved quality of clinic	6.11	1.085
Applied information technology decreased the time for patient to appoint time with physician	6.14	1.105
Applied information technology decreased time of appointment	6.11	1.149
Applied information technology decreased patient's time of waiting	6.04	1.161
Applied information technology decreased patient's time in pharmacy	6.07	1.126
Applied information technology decreased patient's time in waiting lab result	6.01	1.223
Applied information technology decreased patient's time in payment	6.00	1.265
Applied information technology decreased patient's clinic cost	5.52	1.627
Applied information technology improved patient's satisfaction	6.19	1.005

Source: The Author.

Survey results show that maximum score of evaluation items is 6.19, the evaluation item is "Applied information technology improved patient's satisfaction", the variance is 1.005; the minimum score is 5.52, the evaluation item is "Applied information technology significantly decreased patient's clinic cost", the variance is 1.627; the minimum variance is 1.005 and the maximum is 1.627, the smaller variance indicates the stronger consensus of respondents on the evaluation item; the greater the variance, the greater the discrepancy.

5.2.4 Testing of relationship between patient-centered clinical process dimensions and outcomes

The questionnaire is divided into three parts, namely: measurement of the main dimensions of patient-centeredness, outcomes of patient-centered diagnosis & treatment process, and the impact of information technology on the diagnosis & treatment process. Measurement items of each of the three parts are subject to factor analysis, which is, in this study, based on principal component analysis model. The factors are related according to the standard of eigenvalues greater than 1, the factor with Varimax method for orthogonal rotation, the following analyzes the results of iterative convergence within 25 iterations.

5.2.4.1 Analysis of main dimensions of measurement items of patient-centeredness

KMO sphericity test and Bartlet test are applied to the questionnaire items in this part.

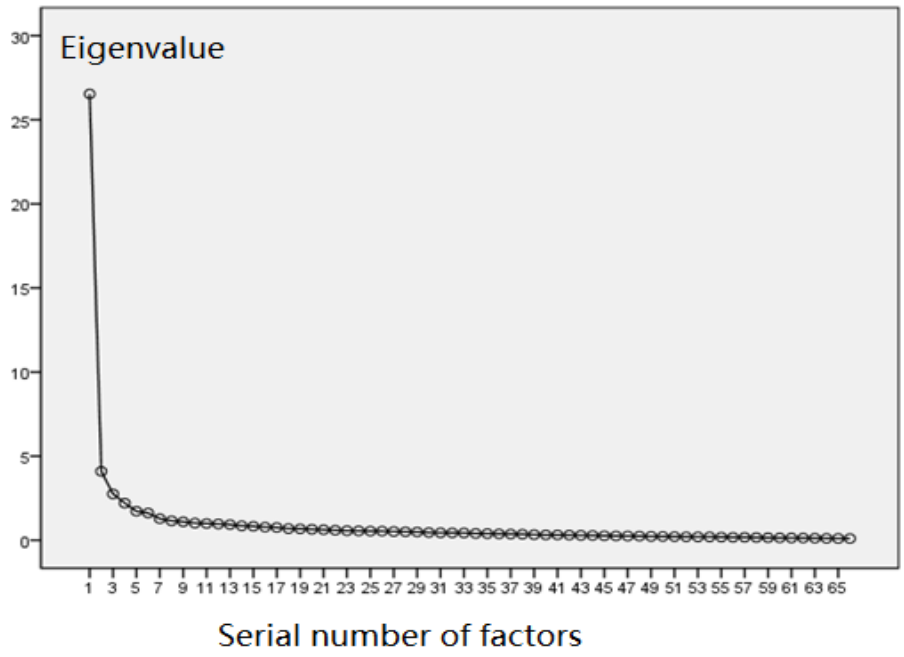
Table 5-8 Factor analysis and test of main dimensions of patient-centeredness

Test Method		value
Kaiser-Meyer-Olkinsphericity test		0.957
Bartlett test	chi-square value	20361.433
	DOF	2145
	P value	<0.001

Source: The Author.

As shown in Table 5-8, KMO value is 0.957, the significance of Bartlet test is less than <0.001, indicating the presence of a strong partial correlation of measurement items, which are suitable for clustering by factor analysis.

Figure 5-1 Scree Plot of factors measuring major dimensions of patient-centeredness



Source: The Author.

According to Figure 5-1, it can be seen that, the results of the factor analysis based on principal component analysis show that characteristic degree of the first 10 common factors is greater than 1, so the author selects the first 10 factors for orthogonal rotation, to obtain results as shown in Table 5-9. It can be seen that cumulative explained variance of the first 10 factors after orthogonal rotation is 65.88%, the explanation effect meets the requirements.

Table 5-9 Variance explanation of factors measuring major dimensions of patient-centeredness

Common factor	starting status			Status after orthogonal rotation		
	Eigenvalue	explained variance	cumulative explained variance	Eigenvalue	explained variance	cumulative explained variance
1	26.536	40.207	40.207	9.603	14.550	14.550
2	4.096	6.207	46.413	8.560	12.969	27.519
3	2.751	4.168	50.581	5.657	8.572	36.091
4	2.207	3.344	53.925	5.233	7.928	44.019
5	1.723	2.611	56.536	3.654	5.536	49.554
6	1.619	2.454	58.990	3.580	5.424	54.979
7	1.280	1.939	60.929	2.412	3.654	58.633
8	1.152	1.746	62.674	2.070	3.137	61.770
9	1.097	1.661	64.336	1.401	2.123	63.892
10	1.018	1.543	65.879	1.311	1.986	65.879

Source: The Author.

Table 5-10 shows the load of the first 10 factors after orthogonal rotation of measurement items. It can be seen that, except for a small number of measurement items, load factors of the 10 factors differ greatly, in view of weak correlation between the factors, this can be easily explained.

Table 5-10 Table of factor loads of main dimensions measuring patient-centeredness

Measurement items	Factors									
	1	2	3	4	5	6	7	8	9	10
Physicians fully understand all patients' medical history	0.447	0.208	0.120	0.125	0.163	0.131	0.065	0.551	0.118	0.037
Physician fully understand patients' health care needs	0.340	0.169	0.280	0.054	0.171	0.170	0.016	0.521	0.115	0.065
Physician concern how patient's health condition affect their personal life (E.g. family relationship)	0.417	0.176	0.228	0.075	0.099	0.261	-0.021	0.285	0.237	0.419
Physician spend time to talk about patient's anxiety /phobia which caused by their health problems	0.414	0.069	0.243	0.062	0.071	0.204	-0.045	0.399	0.010	0.355
Physician will ask about the patient's options of treatment voluntarily.	0.531	0.188	0.283	0.133	0.174	0.199	-0.020	0.231	-0.066	0.263
Physician has compassion of patient's feeling	0.640	0.210	0.291	0.118	0.118	0.027	0.166	0.200	0.052	0.040
Physician show respect, care and attention to patients	0.714	0.270	0.143	0.109	0.201	0.118	0.046	0.159	0.079	0.062
Physician can respond to needs of patient quickly	0.592	0.287	0.225	0.029	0.139	0.063	0.159	0.162	0.207	0.237
Physician treats patients with an attitude of equal respect	0.731	0.280	0.155	0.131	0.208	0.074	0.149	0.075	0.082	0.010
Physician in the clinic is not pushing patient, and each patient will have enough time to think or make decisions	0.625	0.317	0.093	0.126	0.264	0.044	0.164	0.192	-0.025	-0.132
Physician can adapt in the way of patient's communication	0.635	0.250	0.152	0.008	0.102	0.193	0.127	-0.023	0.096	0.070
Physician can properly handle patient's negative emotion	0.619	0.371	0.105	0.090	0.091	0.147	0.194	0.123	-0.043	-0.007
Physician could explain clearly to patient about all matters of diagnosis and treatment	0.651	0.213	0.277	0.112	0.163	0.261	-0.059	0.028	-0.047	0.001
Physician concern how patient's health condition affect their daily routines (such as self-care, work)	0.465	0.195	0.508	0.109	0.029	0.181	-0.003	0.236	0.085	0.149
Patients can always understand physician's explanation about the diagnosis and treatment accurately	0.587	0.257	0.430	0.156	0.093	0.196	-0.043	0.035	-0.040	-0.006
Physician encourage patients to ask questions	0.400	0.240	0.344	0.342	-0.046	0.216	0.013	0.349	-0.105	-0.007
Physician will consider the patient's health information privacy	0.383	0.435	0.386	0.250	0.109	0.059	0.212	0.035	0.015	0.108
Physician listens carefully to the patient's concern	0.653	0.324	0.185	0.092	0.052	0.094	0.203	0.005	0.018	0.124
Communication between physician and patient is very receptive by patient	0.705	0.213	0.237	0.111	0.124	0.183	0.110	0.091	0.083	-0.087
Physician answer patient questions seriously	0.617	0.299	0.221	0.076	0.079	0.155	0.073	0.005	0.034	0.042
Physician can let patients feel relax and comfortable when talking about new signs and symptoms	0.471	0.213	0.483	0.036	0.163	0.189	0.175	0.145	0.175	-0.019
While prescribing, physician will consider factors other than the patient's disease (such as psychological and daily routine)	0.473	0.255	0.457	0.163	0.109	0.107	0.182	0.121	0.016	-0.069

Physician involve patient in the decision-making process voluntarily	0.381	0.245	0.516	0.141	0.202	0.173	0.108	0.263	-0.175	-0.040
Before the meeting, the physician will fully prepare the specific treatment-related agenda for patent	0.346	0.233	0.409	0.253	0.018	0.030	0.063	0.393	-0.132	-0.171
Physician emphasize importance of disease prevention for patients (Community Health)	0.321	0.244	0.718	0.075	0.166	0.075	0.148	0.030	0.120	-0.003
Physician will spend time to explain how to prevent disease and reduce risk factors.	0.281	0.219	0.761	0.063	0.128	0.183	0.054	0.033	0.038	0.071
Physician will provide knowledge that improve quality of life for patient	0.306	0.269	0.736	0.132	0.103	0.115	-0.002	0.223	0.032	0.031
Physician will suggest patient to change their unhealthy habits (such as diet or exercise), in order to promote healthier lifestyle	0.239	0.300	0.720	0.066	0.091	0.025	0.137	-0.007	0.064	0.118
Nurse could clearly explain patient’s situation to patient and their families	0.234	0.536	0.277	0.149	0.072	0.150	0.085	0.206	0.153	0.194
Nurse could give patient good guidance and assistance	0.251	0.598	0.328	0.154	0.036	0.049	0.251	0.206	0.205	0.027
Nurse can understand the patient's emotion	0.276	0.588	0.231	0.060	0.088	0.126	0.194	0.218	0.342	0.047
Nurse and patient share same expectations	0.276	0.500	0.217	0.097	0.176	0.164	0.086	0.191	0.443	0.059
Nurse showing respect, care and attention to patient	0.345	0.549	0.157	0.125	0.183	0.020	0.187	0.135	0.454	-0.042
Nurse can respond to needs of patient quickly	0.369	0.546	0.061	0.055	0.160	0.193	0.201	0.178	0.210	-0.076
Nurse can adapt in the way of patient's communication	0.348	0.658	0.115	-0.043	0.210	0.172	0.143	0.001	0.079	0.010
Nurse can properly handle patient’s negative emotion	0.248	0.738	0.161	0.130	0.068	0.122	-0.007	0.049	-0.063	0.124
Nurse encourage patients to ask questions	0.143	0.708	0.296	0.229	0.080	0.069	0.102	0.224	-0.117	0.007
Nurse listen carefully to the patient concern	0.229	0.768	0.214	0.184	0.147	0.161	0.070	0.009	-0.053	0.045
Nurse will consider the patient's health information privacy	0.319	0.709	0.222	0.129	0.035	0.096	-0.058	0.035	-0.139	0.101
Nurse answer patient questions seriously	0.303	0.729	0.094	0.172	0.134	0.215	0.082	-0.130	0.001	-0.105
communication between nurse and patient is very receptive by patient	0.318	0.717	0.132	0.015	0.202	0.177	0.090	-0.019	0.083	0.005
nurse operate quickly	0.212	0.657	0.134	0.034	0.167	0.205	0.191	0.146	0.036	-0.041
I can choose their favorite physician	0.206	0.112	0.149	0.631	0.136	0.124	-0.096	0.032	0.188	0.056
I can schedule appointment as needed on the day	0.127	0.107	0.043	0.675	0.072	0.104	-0.002	-0.125	0.222	0.244
I can make appointment through the internet	0.011	0.031	-0.053	0.824	-0.017	0.041	0.082	0.008	0.023	0.036
I can still get the help after physician’s office hour.	0.179	0.060	0.234	0.535	0.204	0.125	0.031	-0.063	0.240	-0.290
I can view my medical records through the Internet	0.074	0.081	-0.009	0.812	-0.039	0.082	0.155	0.063	-0.079	-0.042

When choosing a physician, I can preview the evaluation of each physician	0.100	0.119	0.207	0.648	0.239	0.132	0.110	0.194	-0.033	-0.081
I can participated voluntarily to discuss the treatment options with physician	0.117	0.150	0.153	0.554	0.402	0.066	0.139	0.235	-0.138	0.103
I will seek other information related to their health voluntarily	0.032	0.208	0.151	0.595	0.442	0.035	0.214	0.080	-0.163	0.148
I voluntarily participate to learn about prophylactic treatment information	0.020	0.244	0.118	0.568	0.442	-0.013	0.160	0.149	-0.265	0.128
I can follow up and complete all the needed treatment after discharge.	0.196	0.239	-0.097	0.164	0.656	0.191	0.091	0.133	-0.011	0.007
I can cooperate and help physician to diagnosis their health condition	0.151	0.142	0.091	0.123	0.740	0.134	0.085	0.002	0.044	0.035
I can participate in the decision making process related to their treatment	0.177	0.129	0.339	0.330	0.538	0.033	0.039	0.061	-0.075	0.039
I insist once or more health screen annually	0.080	0.050	0.053	0.461	0.144	-0.055	0.059	-0.011	-0.028	0.566
I trust physician’s diagnosis	0.277	0.100	0.199	0.124	0.604	0.220	-0.030	0.072	0.179	0.013
I trust physician’s professional standard	0.350	0.197	0.243	0.111	0.575	0.169	0.020	-0.029	0.198	0.070
It is easy for patient to make an appointment in the hospital	0.091	0.108	0.176	0.154	0.150	0.196	0.581	0.019	0.175	0.044
The signal of floors and units are clear, patients can easily find the unit that they need to go	0.276	0.185	-0.056	0.152	0.045	0.128	0.654	-0.022	0.008	-0.117
The hospital’s environment and facilities are very beneficial to patients, which can reduce the patient's phobia in the hospital	0.175	0.219	0.189	0.146	0.009	0.226	0.607	0.056	-0.071	0.062
Restroom maintain good hygiene, patient feels comfortable	0.111	0.142	0.129	0.010	0.075	0.508	0.438	-0.010	-0.081	0.269
It is convenient for patient to meet with physician	0.176	0.203	0.138	0.132	0.190	0.630	0.375	0.160	0.007	0.028
There is no stop during the meeting	0.255	0.216	0.097	0.104	0.225	0.662	0.227	0.133	0.024	-0.119
The hospital’s communicate atmosphere is very relaxed	0.373	0.324	0.066	0.089	0.201	0.598	0.201	0.114	0.176	-0.020
We offer moderate suitable environment for patient	0.298	0.289	0.241	0.162	0.171	0.678	0.085	0.026	-0.010	0.017
We offer a variety of therapy choices for patients	0.223	0.331	0.130	0.296	0.125	0.615	0.054	0.071	0.095	0.054

Source: The Author.

According to factor loading in Table 5-10, the measurement items fall to 10 factors for clustering, the author formed 10 clusters, as shown in Table 5-11.

In these 10 factors, physicians' communication skills refer to their ability of communicating with patients during admissions and ward rounds; nurses' communication skills refer to the ability of nurses to give patients guidance and assistance; physicians' health education refer to the guidance provided by physicians in improving quality of life and disease prevention; patients' health literacy refers to their ability and initiative to access to information; the patients' cooperative degree refers to their concern and trust of hospital diagnosis, treatment and services; patient medical experience refers to their comprehensive experience of health conditions, service efficiency and communication atmosphere while receiving medical services; convenience degree of medical services refer to the extent of easy access to registration, treatment, dispensary and other processes; physicians' understanding of the patients refer to their knowledge of the patient's medical history, progression and individual needs; nurses' humane care reflects their care with respect to the psychological aspects of patients; the degree of health concern refers to the patient's concerns for their own health status and its possible effects.

From the above description, the dividing of 10 factors is relatively clear and commensurate with the real situation in hospitals.

Table 5-11 Division of factors measuring main dimensions of patient-centeredness

Factors	Corresponding measurement items
Physicians' communication skills	Physician treats patients with an attitude of equal respect
	Physician show respect, care and attention to patients
	Communication between physician and patient is very receptive by patient
	Physician listens carefully to the patient's concern
	Physician could explain clearly to patient about all matters of diagnosis and treatment
	Physician has compassion of patient's feeling
	Physician can adapt in the way of patient's communication
	Physician in the clinic is not pushing patient, and each patient will have enough time to think or make decisions
	Physician can properly handle patient's negative emotion
	Physician answer patient questions seriously
	Physician can respond to needs of patient quickly
	Patients can always understand physician's explanation about the diagnosis and treatment accurately
	Physician will ask about the patient's options of treatment voluntarily.
	While prescribing, physician will consider factors other than the patient's disease (such as psychological and daily routine)
	Physician can let patients feel relax and comfortable when talking about new signs and symptoms
	Physician encourage patients to ask questions
	Physician will consider the patient's health information privacy
Nurses' communication skills	Nurse listen carefully to the patient concern
	Nurse can properly handle patient's negative emotion
	Nurse answer patient questions seriously
	communication between nurse and patient is very receptive by patient
	Nurse will consider the patient's health information privacy
	Nurse encourage patients to ask questions
	Nurse can adapt in the way of patient's communication
	nurse operate quickly
	Nurse could give patient good guidance and assistance
	Nurse can respond to needs of patient quickly
	Nurse could clearly explain patient's situation to patient and their families
Health education provided by physicians	Physician will spend time to explain how to prevent disease and reduce risk factors.
	Physician will provide knowledge that improve quality of life for patient
	Physician will suggest patient to change their unhealthy habits (such as diet or exercise), in order to promote healthier lifestyle
	Physician emphasize importance of disease prevention for patients (Community Health)
	Physician involve patient in the decision-making process voluntarily
	Physician concern how patient's health condition affect their daily routines (such as self-care, work)
Patient's health literacy	I can make appointment through the internet
	I can view my medical records through the Internet

	I can schedule appointment as needed on the day
	When choosing a physician, I can preview the evaluation of each physician
	I can choose their favorite physician
	I will seek other information related to their health voluntarily
	I voluntarily participate to learn about prophylactic treatment information
	I can participated voluntarily to discuss the treatment options with physician
	I can still get the help after physician's office hour.
Patient's degree of cooperation	I can cooperate and help physician to diagnosis their health condition
	I can follow up and complete all the needed treatment after discharge.
	I trust physician's diagnosis
	I trust physician's professional standard
	I can participate in the decision making process related to their treatment
Patient's medical experience	We offer moderate suitable environment for patient
	There is no stop during the meeting
	It is convenient for patient to meet with physician
	We offer a variety of therapy choices for patients
	The hospital's communicate atmosphere is very relaxed
	Restroom maintain good hygiene, patient feels comfortable
The degree of convenience of medical service	The signal of floors and units are clear, patients can easily find the unit that they need to go
	The hospital's environment and facilities are very beneficial to patients, which can reduce the patient's phobia in the hospital
	It is easy for patient to make an appointment in the hospital
Physicians' understanding of the patients	Physicians fully understand all patients' medical history
	Physician fully understand patients' health care needs
	Before the meeting, the physician will fully prepare the specific treatment-related agenda for patent
Nurse humane care	Nurse showing respect, care and attention to patient
	Nurse and patient share same expectations
	Nurse can understand the patient's emotion
Degree of health awareness	I insist once or more health screen annually
	Physician concern how patient's health condition affect their personal life (E.g. family relationship)
	Physician spend time to talk about patient's anxiety /phobia which caused by their health problems

Source: The Author.

5.2.4.2 Result analysis of patient-centered diagnosis & treatment process

KMO test and Bartlett test for the outcomes of patient-centered clinical process

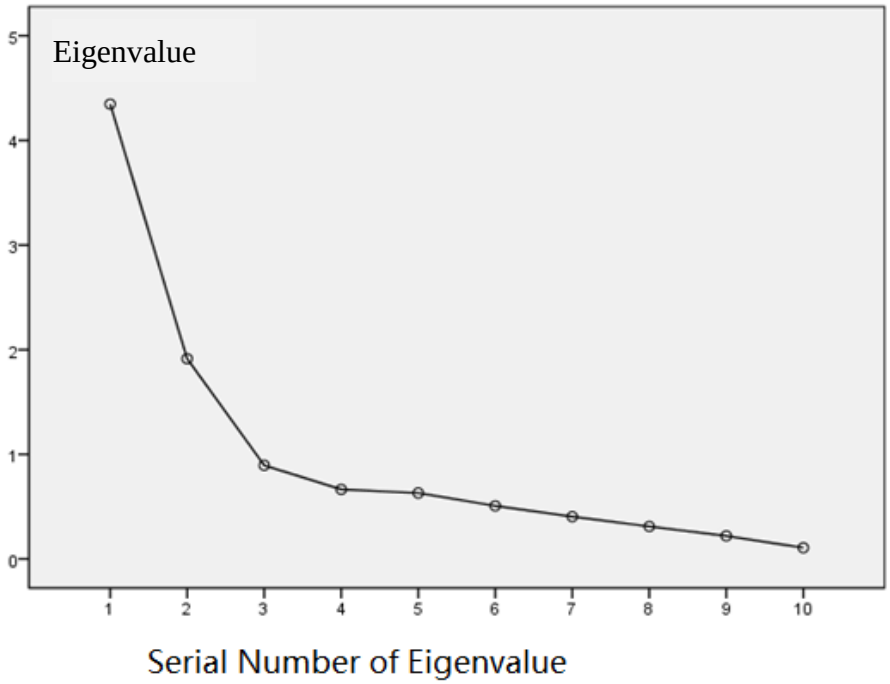
Table 5-12 Correlation test of the outcomes of patient-centered clinical process

Test Method		value
Kaiser-Meyer-Olkin sphericity test		0.813
Bartlett test	chi-squ are value	2143.427
	DOF	45
	P value	<0.001

Source: The Author.

From Table 5-12, the author can see that KMO value of patient-centered clinical process is greater than 0.8, Bartlett test P value is less than 0.001. Measurement items of this part are suitable for factor analysis.

Figure 5-2 Scree Plot of factors measuring outcomes of patient-centered clinical process



Source: The Author.

Figure 5-2 clearly shows that, beginning from the third factor, eigenvalues are less than 1. Therefore, factor analysis of outcomes of patient-centered clinical process selects only the first two factors into orthogonal rotation to obtain the results shown in Table 5-13. The first of two common factors explained a total of 62.61% of total variance, thus effectively explained the discrete situation of the data.

Table 5-13 Variance explanation of outcomes factors of patient-centeredness clinical process

Common factor	starting status			Status after orthogonal rotation		
	Eigenvalue	explained variance		Eigenvalue	explained variance	
1	4.347	43.474	43.474	4.346	43.462	43.462
2	1.913	19.134	62.608	1.915	19.146	62.608

Source:

Table 5-14 shows the load of the first 2 factors after orthogonal rotation of measurement items. It can be seen that, load of the 2 factors differ greatly in various measurement items, therefore it is easy to divide the factors, all measurement items, except for "slow response of the physicians and nurses", are classified in the Category of factor 1.

Table 5-14 Table of factor loads of outcomes of patient-centeredness clinical process

Measurement items	Factors	
	1	2
The hospital provide the necessary information to patients and their families to keep them participating in the treatment process	.717	.004
The hospital do home visit based on the patient's preference	.630	.099
Patient and their families complain about the slow response of physicians	.044	.963
Patient and their families complain about the slow response of nurses.	-.006	.968
The hospital provide targeted self-education resources (such as self-management of body weight, provide education materials about overweight, dietary advice and exercise programs	.636	.137
I will insist on insist on medical advice in diet, exercise, medication, and self-screening	.668	-.004
Overall, I am satisfied with the treatment and care in the hospital.	.852	-.055
Overall, I am satisfied with physician's attitude	.853	-.102
Overall, I am satisfied with physician's quality	.803	-.058
Overall, I am satisfied with the waiting time before meeting physician	.696	.070

Source: The Author.

As shown in Table 5-15, factor 1 contains the service attitude, comprehensive evaluation of a wide range of patient care quality, waiting time, etc., hence the name "overall satisfaction." In order to evaluate the other two patients a response rate of health care, summed up as "demand response speed."

Table 5-15 Division of outcome factors of patient-centeredness clinical process

Factors	Corresponding measurement items
Overall satisfaction	The hospital provide the necessary information to patients and their families to keep them participating in the treatment process
	The hospital do home visit based on the patient's preference
	The hospital provide targeted self-education resources (such as self-management of body weight, provide education materials about overweight, dietary advice and exercise programs
	I will insist on insist on medical advice in diet, exercise, medication, and self-screening
	Overall, I am satisfied with the treatment and care in the hospital.
	Overall, I am satisfied with physician's attitude
	Overall, I am satisfied with physician's quality
	Overall, I am satisfied with the waiting time before meeting physician
Responsiveness to demands	Patient and their families complain about the slow response of physicians
	Patient and their families complain about the slow response of nurses.

Source: The Author.

5.2.4.3 Analysis of information technology's Influence on clinical process

KMO and Bartlett test are performed for measurement items of information that, the result is shown in Table 5-16. KMO value is greater than 0.9, Bartlett test P value is less than 0.001, indicating that the measurement items of this are suitable for factor analysis.

Table 5-16 Pre-testing of factor analysis of information technology's Influence on clinical process

Test Method		value
Kaiser-Meyer-Olkin sphericity test		0.944
Bartlett test	chi-square value	4653.343
	DOF	66
	P value	<0.001

Source: The Author.

The IT section, where in only one factor value is greater than 1, needs only 1 factor for representation, and needs no orthogonal rotation. The following Table 5-17 directly shows the factor loadings of information technology's Influence on clinical process.

Table 5-17 Factor division of information technology's Influence on clinical process

Factors	Corresponding measurement items
IT	Applied information technology changed the way physician treat patient
	Applied information technology changed the way physician make prescription
	Applied information technology improved efficiency of clinic
	Applied information technology improved quality of clinic
	Applied information technology decreased the time for patient to appoint time with physician
	Applied information technology decreased time of appointment
	Applied information technology decreased patient’s time of waiting
	Applied information technology decreased patient’s time in pharmacy
	Applied information technology decreased patient’s time in waiting lab result
	Applied information technology decreased patient’s time in payment
	Applied information technology decreased patient’s clinic cost
	Applied information technology improved patient’s satisfaction

Source: The Author.

Table 5-18 Reliability test results of each section's measurement items

sections	Number of Items	Cronbach's Alpha	Cronbach's Alpha Based on standardized Items
Main dimensions of patient centeredness	66	0.971	0.976
Outcome of patient centered clinical process	10	0.750	0.825
IT adoption and application	12	0.953	0.958

Source: The Author.

5.2.4.4 Construction of regression model based on factor analysis

The above three sections performed the factor analysis of the three parts of the questionnaire respectively; the specific factors obtained are shown in Table 5-19.

Table 5-19 Summarization of Factor analysis results

Questionnaire	Factors
Major dimensions measuring patient-centeredness	Physicians' communication skills
	Nurses' communication skills
	Health education provided by physicians
	Patient's health literacy
	Patient's degree of cooperation
	Patient's medical experience
	The degree of convenience of medical service
	Physicians' understanding of the patients
	Nurses' humane care
	Degree of health awareness
Analysis of the outcomes of patient- centered clinical process	Overall satisfaction
	Responsiveness to the demands
Analysis of the impact of IT on clinical process	IT

Source: The Author.

(1) Construction of regression equation taking overall satisfaction as the dependent variable

Overall satisfaction is the first factor of the outcomes of patient-centeredness clinical process for specific connotation division shown as above. Here the author takes overall satisfaction as the dependent variable, and the remaining factors and respondents' basic information as independent variables to build multiple linear regression models. Stepwise variable selection method is adopted, with variable inclusion criteria of F test P value less than 0.05, excluding F test P values greater than 0.10, the results are shown in Table 5-20.

Table 5-20. Multiple linear regression model taking overall satisfaction as the dependent variable

Selected variables（factors）	Coefficient	standard error	standardized coefficient	T Value	P value	lower confidence limit	upper confidence limit
IT	0.177	0.025	0.177	5.563	<0.001	0.114	0.239
Physicians’ communication skills	0.395	0.032	0.395	15.287	<0.001	0.344	0.446
Health education provided by physicians	0.338	0.026	0.338	13.296	<0.001	0.288	0.388
Patient's degree of cooperation	0.232	0.025	0.232	9.282	<0.001	0.183	0.281
Nurses’ communication skills	0.264	0.025	0.264	9.875	<0.001	0.212	0.317
Patient's medical experience	0.248	0.027	0.248	9.506	<0.001	0.197	0.299
Patient's health literacy	0.254	0.026	0.254	9.402	<0.001	0.201	0.307
The degree of convenience of medical service	0.192	0.027	0.192	7.385	<0.001	0.141	0.243
Physicians’ understanding of the patients	0.131	0.026	0.131	5.230	<0.001	0.082	0.180

Source: The Author.

As the table shows, factors with the greatest impact on overall satisfaction are, in proper order, physicians' communication skills, physicians' health education, nurses communication skills, patients' health literacy, patients medical experience, degree of patient cooperation, medical service convenience degree, information

technology, and physicians' understanding of the patients. R-squared of the model was 0.878, indicating a good explanation validity of the model.

5.2.5 Testing of relationship between antecedents and patient-centered clinical process dimensions

Comprehensive factor score is derived by comprehensive calculation of all factors "measuring the main dimensions of patient-centeredness", and weighted by the amount of total variance explained corresponding to each factor. The calculation formula is:

$$S = \sum_{i=1}^{n} F_i W_i \quad \textbf{(5.1)}$$

Where, s denotes comprehensive factor score, F is the value of the ith factor, W is the amount of total variance explained corresponding to ith factor.

Information technology and background information of respondents as an independent variable, Stepwise variable selection method is adopted, with variable inclusion criteria of F test P value less than 0.05, excluding F test P values greater than 0.10, the results are shown in Table 5-21.

Table 5-21 Multiple linear regression model taking comprehensive factor score as dependent variable

Selected variable (factor)	Selected variables （factors）	Coefficient	standard error	standardized coefficient	T Value	P value	lower confidence limit
IT	.137	.012	.551	11.825	.000	.114	.160

Source: The Author.

Selected variables only include IT, and R-squared model is 0.304, indicating that information technology can explain 30% of patients comprehensive experience, thereby IT has a significant impact on "Patient-centered clinical process."

Chapter 6: Discussion and Conclusions

In this chapter, the author first briefly summarized the findings of this study. Then the author discussed the contributions of the study to both hospital management literature and practices. Finally, limitations of this study and proposed future research directions are also presented.

6.1 Summary of study results

6.1.1 Physician-factors' Influence on 'patient-centered' medical services

In the traditional medical model, "disease-centeredness" compels physicians to focus on the study of the pathogenesis, diagnosis & treatment as well as preventive measures of the disease itself, with little attention to the patient's feelings, it is difficult to listen to the patient's views. It can be said that the patients simply rotate around physicians' 'baton' without real involvement in the diagnosis & treatment process to fight the disease together with physicians. This fact also caused information asymmetry in physician-patient relationship; as a consequence the patient may well cast doubt on the medical program if the treatment results were unsatisfactory. Whereas "Patient-centered" clinical process requires the physicians not only to understand the pathogenesis, conventional treatment and preventive measures of diseases, but also to share the diagnosis & treatment processes with patients and their families, to understand their health needs on the basis of good communication, develop scientific, reasonable, suitable, and appropriate treatment program, so as to gain their understanding, support and cooperation of the medical programs. In the present Study, the author evaluated the influence of Physician-factors on "patient-centered" medical services from 4 major dimensions: physician-patient cooperation, decision-making of diagnosis & treatment programs, diagnosis & treatment methods and preventive health care; the main contents include: (1) continuity throughout the treatment process; (2) physician's equal attitude and treatment of patients; (3) sufficient physician-patient communication; (4)

patient's involvement in the decision-making process; (5) satisfaction of patient's needs in decision-making process (6)appropriate and reasonable provision of medical care; (7) diversified therapies diversity (systemic therapy); (8) medical team's involvement in the development of therapies; (9) public health awareness (of the physician); (10) preventive health care knowledge education for patients and their families. Factor analysis showed that, physicians' communication skills, health education, and understanding of patients have great impact on the "patient-centered" clinical process and patients' overall satisfaction, indicating that the improvements of physicians' service quality and communication skills can effectively achieve “patient-centered " clinical process, and improve patient satisfaction.

6.1.2 Nurse-Factors' impact on "patient-centered" medical services

Traditional nursing process focuses primarily passive execution of Physician Orders, and informing the patient of some information and precautions on procedures. Due to various reasons, the patient's psychological needs and the interaction with the patient are ignored. The relevant researches at home and abroad show that, good nurse-patient communication is conducive to patient treatment and rehabilitation, the positive impact lies mainly in enhanced mutual trust between nurses and patients, helping nurses to stand in the shoes of the patient, correcting the patient's misunderstanding on preventive care, helping patients' self-regulation, creating a good nurse-patient relationship, raising higher requirements for nursing skills, prompting the nurse to keep on learning, so as to improve service quality. In the present study, the author evaluated Nurse-Factor's impact on "patient-centered" medical services from 2 major dimensions: nurse-patient interaction and nursing skills, the main contents include: (1) explicit explanation of the patient status to patients and their families; (2) provision of good guidance and help to the patient; (3) accorded expectations with the patient; (4) respect, care and attention to the patient;(5) fast response to the patient needs; (6) standard operation procedures; (7) quick care; (8) personalized care. Factor analysis showed that nurses'

communication skills and humane care have a great impact on "patient-centered" clinical process, indicating that the enhancements of the quality of nursing services, communication, as well as nurse-patient emotional interaction can effectively achieve the "patient-centered" clinical process; nurse communication skills are also an important factor to enhance patient satisfaction.

6.1.3 Patient-Factors' impact on "patient-centered" clinical process

In the "patient-centered" clinical process, the patient factors can also have an impact, since the authenticity of "Patient-centeredness" is, ultimately and most directly, judged by the patient's experience. Different patients have different needs and diversified attitudes toward diseases, the same is true for their compliance to Physician Orders, hospital visits habits, and health management capabilities. In the present study, the author evaluate Patient-Factors' impact on "patient-centered" clinical process from 3 major dimensions: easy access of medical services, participation in the diagnosis & treatment process, and co-decision-making, the main contents include: 1. freedom of choice of physicians; 2. access to physician's medical quality information while choosing a physician; 3. Feasibility of immediate treatment; 4. Access to physicians help even help after work; 5. Attentions for health self-management;6 .Active participation in treatment programs discussion; 7. compliance to Physician Orders; 8. involvement in the decision-making process and trust in physicians, etc. Factor analysis showed that patients' health literacy, degree of cooperation and attention for health have great impact on "patient-centered" clinical process, health literacy and the degree of physician-patient cooperation also have an impact on patient satisfaction.

6.1.4 Influence of Hospital Management on "patient-centered" clinical process

"Patient-centered" clinical process not only denotes the physician's considerations for the patient in the diagnosis & treatment process, but also connotes the realization of "Patient-centeredness" in all aspects of management of the entire health service providers. This requires the health care management departments to

provide support and guidance to "patient-centered" medical services; and medical institutions to infiltrate the "Patient-centeredness" philosophy into all aspects of management for the establishment of "patient-centered" management model. In the present study, the author evaluated medical institutions' "patient-centered" management model from 4 dimensions: management processes, management team, management environment and hospital Value Outlook, the main contents include:(1) convenient and quick patient visits procedures; (2) Existence of multidisciplinary health care team; (3) hospital facility and environment conducive to the patients (clear hospital guide signals); (4) multidimensional evaluation of the hospital staff (for medical personnel); (5) the hospital's implementation of Publicity of patient-centered concepts and knowledge; (6) medical staff's proper understanding of patient-centeredness; (7) surveys conducted over patient satisfaction. Factor analysis showed that patients' medical experience and convenience of hospital visits can have an impact on "patient-centered" clinical process and patient satisfaction.

6.1.5 Information systems' impact on the "patient-centered" clinical process

Hampered by lower level of information, traditional medical services are basically opaque. Patients have difficult access to their personal medical information, and no modern technologies for management of their personal health records. During hospital visits, they were encountered with cumbersome and lengthy diagnosis & treatment process, especially in hospitals with large patient flow, and fell in the abyss of difficult registration, long waiting line, and difficult access to examination results. While the incessant development of health information technology has provided new ways for medical institutions' "patient-centered" medical service, the level of information technology has increasing impact on medical safety, medical accessibility and health insurance levels. Information technology also has its impact, to some extent, upon the degree of realization of "patient-centered" medical services. In the present study, the author evaluated the influence of information technology on "patient-centered" medical services from 2

major dimensions: HIS' impact on safety and privacy, and HIS utilization, the main contents include:(1) assurance to protect the patient's privacy not to be leaked; (2) the ability to effectively reduce the incidence of medical malpractice; (3) regular system maintenance; (4) patient access to personal medical information via the Information System; (5) patient access to the information of medical personnel via the Information System; (6) patient access to self-management of disease via the Information System; (7) to what extent the Information System has shortened the time for patient visits? (8) Information System's support of decision-making. On this basis, the author conducted questionnaire survey and vis-a-vis communication with medical workers and patients. Factor analysis showed that the level of information technology can have an impact on "patient-centered" clinical process and patient satisfaction, at the same time, information technology is of great help to improving the patient's comprehensive experience.

6.2 Contributions to hospital management literature

For a long time, patient-centeredness, as an important concept for hospital management, has been discussed by many scholars. Since its inception, academics have not yet reached a consensus on its definition. Its definition made by United States IOM (Institute of Medicine), though widely cited by scholars, lacks operability. It emphasized the importance of patient involvement in medical services, but failed to provide a clear path for implementation of this concept. On the basis of IOM's definition, this Study proposed the concept of patient-centered clinical processes, to put the concept of patient-centeredness into the most basic and essential interface: clinical processes. Meanwhile, through literature analysis and empirical research, this Study further proposed the core dimensions of patient-centered clinical processes. Two aspects of contributions have been made: on the one hand, this Study provides a complete conceptual framework for patient-centered clinical process; on the other hand, it also provides a theoretical basis for the development of assessment tools for patient-centered clinical process.

In effect, the questionnaires developed on this basis in the study have good reliability and validity, and to some extent, merits further promotion and application.

In addition, this study also revealed empirically the relations of various dimensions of patient-centered clinical processes with the patient perceived value (represented in this study as patient's overall satisfaction). Different dimensions' impacts on patient satisfaction have remarkable statistical significance. The adoption and application of information technology determines the scores of the various dimensions of patient-centered clinical processes. These findings have consistency with previously reported Western papers. But in the unique environment of China's health system, this association is for the first time, validated empirically in this study.

6.3 Contributions to hospital management practice

For most Chinese hospitals, patient-centeredness has been, for a very long period of time, tantamount to an empty slogan and lip service. Until recent years, along with the universal application of information technology to the medical services and their management, hospitals were under dual pressure from the market and the government, therefore a few hospitals spontaneously carried out the practice of patient-centered care. These practices tend to be sporadic an unsystematic, and also in lack of empirical evidence and theoretical guidance from domestic China for a long time. The definition of patient-centered clinical process, dimensions and the corresponding evaluation questionnaire in this study can provide a set of reference tools for Chinese Hospital managers and practitioners. These dimensions can be applied either to pilot projects designed to improve the work flow and enhance patient perceived value, or as a tool to assess the realization of the goals of the projects. The multiple dimensions of patient-centered clinical process developed in this study based on empirical analysis and case studies are scenario-based and operable, and will provide useful guidance to hospital administrators.

6.4 Limitations of the study

6.4.1 Cross-sectional study brings limitations.

This study is based on a cross-sectional research design, all data are collected in a very short period of time, while the consecutive longitudinal changes in the wake of patient-centered process transformation cannot be observed, and therefore comparisons cannot be made with respect to different dimensions and patient outcomes in disease-centered, physician-centered and patient-centered clinical processes. Although the study has, to some extent, revealed the changes brought forth by patient-centered clinical processes through qualitative analysis of interviews, but the limitations of the research design of this study have complicated the establishment of an explicit quantitative causal effect between the associations of changes in different dimensions with patient satisfaction.

6.4.2Limitations of information sample collection

Data collected within one large hospital, it is valid because the unit of the analysis is the stakeholders' perceptual assessment of the extent to a given specific hospital clinical process is patient-centered based on their experiences using the key dimensions developed in this research. But this study does not capture the influences of hospital-level and regional-level variables on the various relationships depicted in the research framework.

6.5 Directions for future research

6.5.1In-depth case studies

Develop in-depth case studies based on historical information to capture the evolutionary paths and differences between the different clinical processes. Both the evolution of patient-centered clinical practice and the attributes of clinical practice itself are intricate and complex enough. To achieve a better understanding of the behaviors of the physicians, nurses, patients, and their interactions during the shifting process from "disease-centered or physician centered" practice to "patient-centered" practice, a well-designed in-depth case study rooted in

appropriate theories is needed. It is essential to include more key informants in the interviews, collect more comprehensive performance data, and adopt more sophisticated quality analysis methods in the study as well.

6.5.2Comparative study in multiple hospitals

The future study need to collect survey data from different hospitals to investigate how the hospital- and regional differences affect the study results. In a rapidly changing economy, there are a lot of varieties among Chinese hospitals from daily clinical services and management, to organizational culture. It cannot be ignored that different social-economic contexts have great impacts on the patient-centered practice in various geographic areas across the country. To understand to which degree and how these macro-factors have impacts on the patient-centered clinical process and the core dimensions, the future study need to include hospitals from areas at different level of development or with unique social-economic features, and focus on the comparative analysis of social, economic, cultural, regional factors and their interactions.

6.6 Conclusions

Given the huge population base and relatively limited health resources, the Chinese government has been trying to maintain a balance between promoting population health outcomes and controlling health costs. Within such a background Chinese hospitals are imposed great pressure from both governmental regulations and market competitions. The central focus is placed on increasing patient's value from multi-perspectives from different stakeholders. Today there is new openness to change the system toward more self-adaptive patient-centered care, enabled by information and communication technologies. However, despite several waves of debate and piecemeal movements of patient-centered health services, the concept and key dimensions of patient-centered clinical process remain ambiguous.

This study adopts a multiple methodological pathway to investigate the key dimensions of patient-centered clinical process, their impacts on patient's outcome,

and the antecedents that determine the dimensions as well. Firstly, the author developed the concept and dimensions of patient-centered clinical process through literature analysis. As a result, a conceptual framework with five dimensions such as diagnosis & treatment, nursing, communication, management, information, was developed. Though our empirical study, those dimensions were found to be significant associated with patient's satisfaction. And the adoption of information technologies was found to be a significant antecedent that determines these core dimensions of patient-centered clinical process.

This Study provides both theoretical and practical contributions. A complete conceptual framework for patient-centered clinical process provides a theoretical basis for the development of assessment tools for patient-centered clinical process. These dimensions can be applied either to pilot projects designed to improve the work flow and enhance patient perceived value, or as a tool to assess the realization of the goals of the projects. However, the extrapolation of this study would be careful due to the limitations of small survey sample and cross-sectional observations.

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Appendix Patient-centered treatment process questionnaire

Part I: Background Information

Please provide the following information about your background:

1. Your Occupation (√ check one):

__Government Employee __Enterprise Employee __ Self-employed __ Farmer

__ Others

2. Level of professions (√ check one):

__Junior __Intermediate __Pre senior __Senior __ Undefined

3. Highest degree earned and year (√ check one):

__PhD __ Masters __ Bachelor __Associate __ Polytechnic _Other: ____

Year of Highest degree earned (E.g. 2005): _____

4. Which unit you got treatment this time: _____

5. How many times you visit our hospital: _____

6. How many times you visit this unit: _____

7. The meeting time you meet the physician is approximately _____ minutes

8. The first time you used all-purpose card/ attendance card (E.g. June. 2010): _____

9. The average time that you use computer:

a. _____at least once every day

b. _____at least once every week

c. _____at least once every month

d. _____never use computer

10 Your Gender: ___ Male ___ Female

11 Your Age: ___ years old

Part II: The main dimensions to measure patient-centered treatment process

Depending on your personal experience, real feelings and indirect observations, please cycle a number of each degree to represent your attitude of declarative consent (1 represents strongest disagreement, 7 represents strongest agreement). Ratings do not have an answer or objective criteria. Please use judgments or estimates based on your own knowledge and observation. Please answer all questions.

2.1 Physician

During the meeting time with patients,

a.	Physicians fully understand all patients' medical history	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	Physician fully understand patients' health care needs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	Physician concern how patient's health condition affect their personal life (E.g. family relationship)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	Physician spend time to talk about patient's anxiety /phobia which caused by their health problems	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	Physician will ask about the patient's options of treatment voluntarily.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	Physician has compassion of patient's feeling	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	Physician show respect, care and attention to patients	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h.	Physician can respond to needs of patient quickly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i.	Physician treats patients with an attitude of equal respect	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j.	Physician in the clinic is not pushing patient, and each patient will have enough time to think or make decisions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k.	Physician can adapt in the way of patient's communication	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l.	Physician can properly handle patient's negative emotion	**1**	**2**	**3**	**4**	**5**	**6**	**7**
m.	Physician could explain clearly to patient about all matters of diagnosis and treatment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
n.	Physician concern how patient's health condition affect their	**1**	**2**	**3**	**4**	**5**	**6**	**7**

	daily routines (such as self-care, work)							
o.	Patients can always understand physician's explanation about the diagnosis and treatment accurately	**1**	**2**	**3**	**4**	**5**	**6**	**7**
p.	Physician encourage patients to ask questions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
q.	Physician will consider the patient's health information privacy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
r.	Physician listens carefully to the patient's concern	**1**	**2**	**3**	**4**	**5**	**6**	**7**
s.	Communication between physician and patient is very receptive by patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**
t.	Physician answer patient questions seriously	**1**	**2**	**3**	**4**	**5**	**6**	**7**
u.	Physician can let patients feel relax and comfortable when talking about new signs and symptoms	**1**	**2**	**3**	**4**	**5**	**6**	**7**
v.	While prescribing, physician will consider factors other than the patient's disease (such as psychological and daily routine)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
w	Physician involve patient in the decision-making process voluntarily	**1**	**2**	**3**	**4**	**5**	**6**	**7**
x.	Before the meeting, the physician will fully prepare the specific treatment-related agenda for patent	**1**	**2**	**3**	**4**	**5**	**6**	**7**
y.	Physician emphasize importance of disease prevention for patients (Community Health)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
z.	Physician will spend time to explain how to prevent disease and reduce risk factors.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
aa	Physician will provide knowledge that improve quality of life for patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**
bb	Physician will suggest patient to change their unhealthy habits (such as diet or exercise), in order to promote healthier lifestyle	**1**	**2**	**3**	**4**	**5**	**6**	**7**

2.2 Nurse

a.	Nurse could clearly explain patient's situation to patient and their families	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	Nurse could give patient good guidance and assistance	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	Nurse can understand the patient's emotion	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	Nurse and patient share same expectations	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	Nurse showing respect, care and attention to patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	Nurse can respond to needs of patient quickly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	Nurse can adapt in the way of patient's communication	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h.	Nurse can properly handle patient's negative emotion	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i.	Nurse encourage patients to ask questions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j.	Nurse listen carefully to the patient concern	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k.	Nurse will consider the patient's health information privacy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l.	Nurse answer patient questions seriously	**1**	**2**	**3**	**4**	**5**	**6**	**7**
m.	communication between nurse and patient is very receptive by patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**
n.	nurse operate quickly	**1**	**2**	**3**	**4**	**5**	**6**	**7**

2.3 Patient

a.	I can choose their favorite physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	I can schedule appointment as needed on the day	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	I can make appointment through the internet	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	I can still get the help after physician's office hour.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	I can view my medical records through the Internet	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	When choosing a physician, I can preview the evaluation of each physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	I can participated voluntarily to discuss the treatment options with physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h.	I will seek other information related to their health voluntarily	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i.	I voluntarily participate to learn about prophylactic treatment	**1**	**2**	**3**	**4**	**5**	**6**	**7**

	information							
j.	I can follow up and complete all the needed treatment after discharge.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k.	I can cooperate and help physician to diagnosis their health condition	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l.	I can participate in the decision making process related to their treatment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
m.	I insist once or more health screen annually	**1**	**2**	**3**	**4**	**5**	**6**	**7**
n.	I trust physician's diagnosis	**1**	**2**	**3**	**4**	**5**	**6**	**7**
o.	I trust physician's professional standard	**1**	**2**	**3**	**4**	**5**	**6**	**7**

2.4 treatment process

a.	It is easy for patient to make an appointment in the hospital	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	The signal of floors and units are clear, patients can easily find the unit that they need to go	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	The hospital's environment and facilities are very beneficial to patients, which can reduce the patient's phobia in the hospital	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	Restroom maintain good hygiene, patient feels comfortable	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	It is convenient for patient to meet with physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	There is no stop during the meeting	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	The hospital's communicate atmosphere is very relaxed	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Result in patient-centered clinical process: Part III

Depending on your personal experience, real feelings and indirect observations, please cycle a number of each degree to represent your attitude of declarative consent (1 represents strongest disagreement, 7 represents strongest agreement). Ratings do not have an answer or objective criteria. Please use judgments or estimates based on your own knowledge and observation. Please answer all questions.

3.1 Patient meeting process

a.	The hospital provide the necessary information to patients and their families to keep them participating in the treatment process	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	The hospital do home visit based on the patient's preference	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	Patient and their families complain about the slow response of physicians	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	Patient and their families complain about the slow response of nurses.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	The hospital provide targeted self-education resources (such as self-management of body weight, provide education materials about overweight, dietary advice and exercise programs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	I will insist on insist on medical advice in diet, exercise, medication, and self-screening	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	Overall, I am satisfied with the treatment and care in the hospital.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h.	Overall, I am satisfied with physician's attitude	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i.	Overall, I am satisfied with physician's quality	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j.	Overall, I am satisfied with the waiting time before meeting physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**

3.2 The effectiveness of how medical information technology change treatment

If you have several meeting and treatment experiences in this hospital, please provide following information: compare to the treatment process before the hospital apply new information technology (E.g. all-purposed card, electoral medical record, prescription system)

a.	Applied information technology changed the way physician treat patient	**1**	**2**	**3**	**4**	**5**	**6**	**7**
b.	Applied information technology changed the way physician make prescription	**1**	**2**	**3**	**4**	**5**	**6**	**7**
c.	Applied information technology improved efficiency of clinic	**1**	**2**	**3**	**4**	**5**	**6**	**7**
d.	Applied information technology improved quality of clinic	**1**	**2**	**3**	**4**	**5**	**6**	**7**
e.	Applied information technology decreased the time for patient to appoint time with physician	**1**	**2**	**3**	**4**	**5**	**6**	**7**
f.	Applied information technology decreased time of appointment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
g.	Applied information technology decreased patient's time of waiting	**1**	**2**	**3**	**4**	**5**	**6**	**7**
h.	Applied information technology decreased patient's time in pharmacy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
i.	Applied information technology decreased patient's time in waiting lab result	**1**	**2**	**3**	**4**	**5**	**6**	**7**
j.	Applied information technology decreased patient's time in payment	**1**	**2**	**3**	**4**	**5**	**6**	**7**
k.	Applied information technology decreased patient's clinic cost	**1**	**2**	**3**	**4**	**5**	**6**	**7**
l.	Applied information technology improved patient's satisfaction	**1**	**2**	**3**	**4**	**5**	**6**	**7**