ISCTE IUL

Instituto Universitário de Lisboa

Human Resource Management Strategies for Increasing Hospital Employee Satisfaction and Engagement

HE Jing

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

Doctor of Management

Supervisor:

Prof. Aristides I. Ferreira, Assistant Professor,

ISCTE University Institute of Lisbon

September, 2018

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Abstract

Purpose: This study aims to understand medical workers' perceptions of hospitals' human resource management and the respective influences on the workers' job satisfaction and job engagement. It also discusses the workers' intrinsic relationships in order to present human resource management strategies and suggestions for increasing the job satisfaction and engagement of hospital employees.

Methods: The simple random sampling method was adopted, with on-the-job employees of Shenzhen Maternal and Child Health Hospital sampled as respondents. A questionnaire survey was then used to obtain relevant data. The questionnaire consists of four parts: (1) basic information of the respondents, including gender, length of service, marital status, monthly income, position, professional title, age, etc.; (2) human resource management situation, using high-performance work systems (HPWS) for evaluation; (3) employee job satisfaction, using the Minnesota Satisfaction Questionnaire (MSQ) for evaluation; and (4) employee job engagement, using Gallup Q12 and Utrecht Work Engagement Scale-9 for evaluation. A total of 445 valid questionnaires were recovered, with an effective rate of 91.92 per cent. Analysis methods such as correlation analysis, multi-factor linear regression and factor analysis were then adopted for statistical analysis.

Results:

1. After reliability and validity analysis adjustment, the HPWS scale includes a total of 16 items, divided into three dimensions: recruitment and selection, promotion and training, and performance appraisal and salary management. The Cronbach's α is 0.901 and the total score of human resource management perception was 87.91±12.31 points. There were statistical differences (p<0.05) in the human resource management perception between medical workers of different educational attainments, positions and monthly income.

2. After reliability and validity analysis adjustment, the MSQ scale includes a total of 14 items existing on one dimension. The Cronbach's α is 0.94 and the total score of the job satisfaction of respondents was 38.67±10.26 points. There were statistical differences (p<0.05) in the job satisfaction between medical workers of different genders, ages, types of marital status, professional titles, positions and lengths of service.

3. After adjustment of reliability and validity analysis, a total of 10 items were left in the

Gallup-Q12 scale, divided into two dimensions consisting of basic job requirements, support from management and joint development. The Cronbach's α is 0.86 and the job engagement-Gallup of respondents was 31.81±9.46 points. General demographic characteristics that affect hospital employees' job engagement-Gallup include age and position ($p<0.05$).

4. After adjusting the reliability and validity analysis, the UWES-9 scale consists of seven items on one dimension, with a Cronbach's α of 0.95. The job engagement-UWES of respondents scored 28.38±11.59 points. There are differences in the job engagement-UWES of medical workers of different educational attainments, professional titles, positions, lengths of service and monthly income ($p<0.05$).

5. The score of each dimension of human resource management perception and their total score were both significantly positively correlated to the score of job satisfaction ($p<0.05$). However, after adjusting the influences of general demographic characteristics (gender, length of service, marital status, monthly income, position, professional title and age), the dimension of recruitment and selection had no correlation with each dimension of job satisfaction and its total score ($p>0.05$), whereas promotion and training, as well as performance appraisal and salary management, had a significantly positive correlation with the score of job satisfaction ($p<0.05$). Similar relationships were found between human resource management perception with job engagement-Gallup and job engagement-UWES ($p<0.05$).

Conclusions: Human resource management perceptions have significant influences on job satisfaction and job engagement. Hospitals should focus on establishing a promotion and training system that helps medical workers improve their quality and professional skills, as well as setting up a reasonable and fair performance appraisal and salary management system in order to increase job satisfaction and job engagement.

Keywords: Human resource management; job satisfaction; job engagement

JEL: M12; M6.

Resumo

Objetivo: Este estudo tem como objetivo compreender as percepções dos profissionais médicos sobre o gestão de recursos humanos nos hospitais e as respectivas influências na satisfação profissional e no envolvimento no trabalho dos trabalhadores. Ele também discute as relações intrínsecas dos trabalhadores a fim de apresentar estratégias de gestão de recursos humanos e sugestões para aumentar a satisfação no trabalho e o envolvimento dos funcionários do hospital.

Métodos: O método de amostragem aleatória simples foi adotado, com funcionários no local de trabalho do Hospital Materno-Infantil de Shenzhen amostrados como respondentes. Um inquérito por questionário foi então usado para obter dados relevantes. O questionário é composto por quatro partes: (1) informações básicas dos entrevistados, incluindo sexo, tempo de serviço, estado civil, renda mensal, cargo, título profissional, idade, etc .; (2) situação de gestão de recursos humanos, utilizando sistemas de trabalho de alto desempenho (HPWS) para avaliação; (3) satisfação no trabalho dos funcionários, usando o Minnesota Satisfaction Questionnaire (MSQ) para avaliação; e (4) engajamento do trabalho dos funcionários, usando o Gallup Q12 e o Utrecht Work Engagement Scale-9 para avaliação. Um total de 445 questionários válidos foram recuperados, com uma taxa efetiva de 91,92%. Métodos de análise como análise de correlação, regressão linear multifatorial e análise fatorial foram então adotados para análise estatística.

Resultados:

1. Após ajuste de confiabilidade e validade, a escala HPWS inclui um total de 16 itens, divididos em três dimensões: recrutamento e seleção, promoção e treinamento, avaliação de desempenho e gestão salarial. O α de Cronbach é 0,901 e a pontuação total da percepção da gestão de recursos humanos foi de 87,91 ± 12,31 pontos. Houve diferenças estatísticas ($p < 0,05$) na percepção da gestão de recursos humanos entre trabalhadores médicos de diferentes níveis de escolaridade, posições e renda mensal.
2. Após o ajuste da análise de confiabilidade e validade, a escala MSQ inclui um total de 14 itens existentes em uma dimensão. O α de Cronbach é 0,94 e o escore total da satisfação no trabalho dos entrevistados foi de 38,67 ± 10,26 pontos. Houve diferenças estatísticas (p

<0,05) na satisfação profissional entre trabalhadores médicos de diferentes gêneros, idades, tipos de estado civil, títulos profissionais, cargos e tempo de serviço.

3. Após o ajuste da análise de confiabilidade e validade, um total de 10 itens foram deixados na escala Gallup-Q12, divididos em duas dimensões, consistindo de requisitos básicos de trabalho, apoio da gerência e desenvolvimento conjunto. O α de Cronbach é 0,086 e o engajamento no trabalho-Gallup dos entrevistados foi de 31,81 ± 9,46 pontos. Características demográficas gerais que afetam o engajamento do trabalho dos funcionários do hospital - O Gallup inclui idade e posição (p <0,05).

4. Após ajustar a análise de confiabilidade e validade, a escala UWES-9 é composta por sete itens em uma dimensão, com α de Cronbach de 0,95. O engajamento no trabalho-UWES dos entrevistados pontuou 28,38 ± 11,59 pontos. Existem diferenças no engajamento do trabalho - UWES de trabalhadores médicos de diferentes realizações educacionais, títulos profissionais, cargos, tempo de serviço e renda mensal (p <0,05).

5. O escore de cada dimensão de percepção de gestão de recursos humanos e seu escore total foram ambos significativamente correlacionados positivamente com o escore de satisfação no trabalho (p <0,05). No entanto, após ajustar as influências das características demográficas gerais (sexo, tempo de serviço, estado civil, renda mensal, cargo, título profissional e idade), a dimensão de recrutamento e seleção não apresentou correlação com cada dimensão de satisfação no trabalho e sua pontuação total. (p> 0,05), enquanto promoção e treinamento, bem como avaliação de desempenho e gestão salarial, tiveram uma correlação significativamente positiva com o escore de satisfação no trabalho (p <0,05). Relacionamentos semelhantes foram encontrados entre a percepção da gestão de recursos humanos com engajamento no trabalho - Gallup e engajamento no trabalho - UWES (p <0,05).

Conclusões: As percepções da gestão de recursos humanos têm influências significativas na satisfação no trabalho e no envolvimento no trabalho. Os hospitais devem concentrar no estabelecimento de um sistema de promoção e treinamento que ajude os trabalhadores médicos a melhorar sua qualidade e habilidades profissionais, bem como a criação de um sistema de avaliação de desempenho razoável e justo para aumentar a satisfação no trabalho e o envolvimento no trabalho.

Palavras-chave: Gestão de recursos humanos; satisfação no trabalho; envolvimento no trabalho

JEL: M12; M6.

摘 要

目的：了解医务人员对医院人力资源管理认知情况、工作满意度、工作敬业度和工作投入度的影响，探讨其内在关系，从而提出提升医院员工满意度和敬业的人力资源管理的对策及建议。

方法：采用简单随机抽样的方法，随机抽取深圳市妇幼保健院在职员工为研究对象。采用问卷调查的方式获取相关数据，调查表内容包括 4 个部分：①调查对象基本信息：包括性别、工龄、婚姻状况、月收入、职务、职称、年龄等；②人力资源管理情况：采用 High-performance work systems（HPWS）量表进行评估；③员工满意度情况：采用明尼苏达满意度量表（MSQ）进行评估；④员工敬业度情况：采用盖洛普 Q12 和 Utrecht-9 工作投入量表（Utrecht Work Engagement Scalte-9，UWES-9）进行评估。最终回收有效问卷 455 份，有效率为 91.92%。采用相关分析、多因素线性回归、因子分析等分析方法进行统计分析。

结果：

1.HPWS 量表经信效度分析调整后，共包括 16 个条目，分为三个维度，包括招聘与选拔、晋升与培训和绩效考核与薪酬管理，Cronhach α 为 0.901。人力资源管理认知总得分为 87.91±12.31 分， 不同学历、岗位和月收入医务人员人力资源管理认知情况存在统计学差异（p<0.05）。

2. MSQ 量表经信效度分析调整后，共包括 14 个条目，存在一个维度，Cronhach α 为 0.94。研究对象工作满意度总分为 38.67±110.26 分，不同性别、年龄、婚姻状况、职称、岗位、工龄员工工作满意度存在统计学差异（p<0.05）。

3.盖洛普-Q12 量表经信效度分析调整后，共包括 10 个条目，分为 2 个维度，包括工作基本需求、管理层支持和共同发展维度，Cronhach α 为 0.886。研究对象工作敬业度总得分为 31.81±9.46 分，影响医院员工工作敬业度的一般人口学特征包括年龄、岗位等（p<0.05）。

4. UWES-9 量表经信效度分析调整后，共包括 7 个条目，存在一个维度，Cronhach α 为 0.95。研究对象工作敬业度总得分为 28.38±11.59 分，不同学历、职称、岗位、工龄、月收入医务人员工作敬业度不同（p<0.05）。

5. 人力资源管理认知情况各维度及总分与工作满意度得分均呈显著正相关（p<0.05），但调整了一般人口学特征（性别、工龄、婚姻状况、月收入、职务、职称、年龄）的影响后，招聘与选拔与选拔维度与工作满意度各维度及总得分无相关性（p>0.05），而晋升与培训和绩效考核与薪酬管理与工作满意度得分显著正相关（p<0.05）。人力资源管理认知情况各维度及总分与工作敬业度相关性与之一致（p<0.05）。

结论：人力资源管理对工作满意度和工作敬业度有显著影响。医院应重点建立提高医务人员素质和专业技能的晋升与培训制度，合理公平的绩效考核和薪酬管理制度，从而提高工作满意度和工作敬业度。

关键词：人力资源管理；工作满意度；工作敬业度

JEL: M12; M6.

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Chapter 1: Introduction

1.1 Research background and research question

As China's medical system reform deepens and the competition in the medical markets of various ownerships becomes fiercer, the reform of public hospitals has sought to uphold public welfare, mobilise initiative, bring tangible benefits to the general public and inspire medical workers (Fang, 2012). Hospital employees play a pivotal and essential role in the provision of medical services because they are required to have extensive knowledge reserves, good educational backgrounds and strong work experience. Furthermore, their work, which has become increasingly sophisticated, requires advanced skills and gives them growing responsibilities relevant to the safety of patients.

Studies in many countries have found that the satisfaction of medical workers is closely linked to the quality and efficiency of medical services, as well as the satisfaction of patients. On one hand, the satisfaction of hospital employees is critical to the success of public hospital reform. This is because employee satisfaction is the pre-factor that influences the satisfaction of clients and is the key to resolving the conflicts between hospitals and patients. Satisfied employees will bring about satisfied clients. The satisfaction of employees remains a key factor linking the internal management and external management of an organisation. It could reflect the internal service quality, affect the loyalty and work efficiency of employees, and influence the satisfaction of customers and the organisational appeal (Li, 2014). As China's medical system reform deepens and the competition in the medical markets of various ownerships becomes increasingly fierce, the reform of public hospitals has sought to uphold public welfare, mobilise initiative, bring tangible benefits to the general public and inspire medical personnel (Wang, 2009). Studies in many countries have indicated that medical workers' satisfaction is closely related to medical service quality, efficiency and patients' satisfaction level (Carter & Tourangeau, 2012). Wang (Wang, 2011) argued that the satisfaction of hospital employees is critical to the success of public hospital reform, while Liu et al. (2011) held that employee satisfaction is the antecedent factor that influences

customer satisfaction and the key to resolving doctor–patient conflicts and that satisfied employees produce satisfied patients. A study carried out by a research group from Harvard University suggests that employee satisfaction is a key factor that connects organisational internal management and external operation. It can reflect the internal service quality and affect employees' loyalty and work efficiency, and also influence customer satisfaction and organisational appeal (Yang & Jiang, 2007).

On the other hand, with the constantly changing needs and expectations of employees, simply increasing customer satisfaction can no longer ensure sustainable and long-term development of an organisation (Liu, 2009). Many experts believe that the engagement of employees has a direct impact on organisational success, and engagement means they want to and do make contributions. Engagement, as an expression of behaviour and attitude, is closer to the term "competence" put forward in the field of human resource management research in recent years and it refers to the extent to which employees "can" make contributions. Committed employees affect organisational performance the most. Some have compared employee engagement to "loving" and organisational commitment to "the willingness to" make contributions.

Given the important role of medical workers' satisfaction and engagement, cultivating and promoting their satisfaction and engagement becomes a crucial issue facing hospital management. Many scholars recently began paying attention to research on applying high-performance work systems (HPWS) within the health-care industry, while focusing on the impact of human-resource practices on organizational performance. The health-care industry is a member of the knowledge-intensive service industry. By adopting HPWS, hospitals can raise job-satisfaction levels of its health-care professionals and enable them to work more proactively, thus improving patient satisfaction. This, in turn, enhances the performance of the medical institution. Furthermore, given the professional nature and complexity of the health-care industry, one must also to introduce a scientific management method to the health-care industry to raise management efficiency, while paying close attention to the job satisfaction rate of its health-care professionals. It is imperative to formulate a best human-resource management strategy to increase employee satisfaction and engagement.

Although HPWS may play a big role in cultivating medical-worker satisfaction and engagement, empirical study is lacking. On the other hand, studies about adopting HPWS in

the health-care industry are still few and far between in China. Specifically, there is little knowledge about how to apply HPWS to promote health-care professionals' satisfaction and work engagement in the health-care industry in the Chinese context. Hospital human-resource management started relatively late, but quickly developed quickly. Studies in relevant fields have made some breakthroughs (Lan, 2012). Conducting employee satisfaction and engagement research is essential for lowering employee turnover rate and increasing enterprises' economic performance. A hospital's purpose is to serve people by healing the wounded and sick. China has carried out four, large-scale, health-service research surveys of mainly patient-satisfaction data. Such surveys have also been carried out many times in Shenzhen. However, these surveys have neglected the importance of satisfying and engaging medical workers. Only when hospital employees' satisfaction with their own jobs increases can there be greater engagement to increase the hospital's service quality. At present, there is still no consensus on the intrinsic relationships between human-resource management and job satisfaction, engagement, employee work levels, and their influencing factors. In light of this situation, this research focuses on health-care professionals' current perception of HPWS and attempts to empirically test its impact on job satisfaction and work engagement.

In light of this situation, this research will focus on the health care professionals' current perception of HPWS and attempts to empirically test its impact on job satisfaction and work engagement.

1.2 Research purpose

Based on the current research status and the actual work needs of hospitals, the present study intends to achieve the following research goals through a cross-sectional survey.

(1) Understand the status of job satisfaction and engagement of hospital employees.

(2) Understand hospital employees' perceptions of hospital human resource management status.

(3) Based on the above research, discuss the correlations and interactions that may exist in the period and formulate the strategies for increasing the job satisfaction and engagement of hospital employees from the perspective of human resource management.

1.3 Research contribution

Results of this research will enrich the literature regarding the job satisfaction and engagement of hospital staff, expand the target variables formulated by human resource management strategies, and provide scientific references for hospital management and decision-making.

1.3.1 Theoretical contribution of this study

Most studies on increasing hospital employee job satisfaction and engagement from the perspective of human-resource management in the Chinese context are independent studies or comparative studies of two cases. Few studies have simultaneously and systematically explored the correlation between job satisfaction, engagement, and hospital employees' perception of human-resource management. This study can enrich existing theories in relevant fields by exploring the effect of human-resource management influence on the job satisfaction and engagement of hospital employees, as well as the interactions between them.

1.3.2 Practical contribution of this study

The results of this study are conducive to: (1) further improving medical workers' job satisfaction and engagement to improve the quality of medical services; (2) improving hospital management to mobilize medical workers' initiative to the maximum extent; (3) improving medical workers' physical and mental health; and (4) facilitating the communication between managers and medical workers to enhance organizational effects.

1.4 Research contents and framework

According to the above research purpose, research significance and research hypotheses, the content and framework of this study are as follows.

Chapter 1: Foreword, which introduces the research background and clarifies the research significance, research content and research ideas.

Chapter 2: Literature review, which reviews relevant domestic and international research progress from such aspects as the concept, influencing factors and improvement strategies of job satisfaction and engagement.

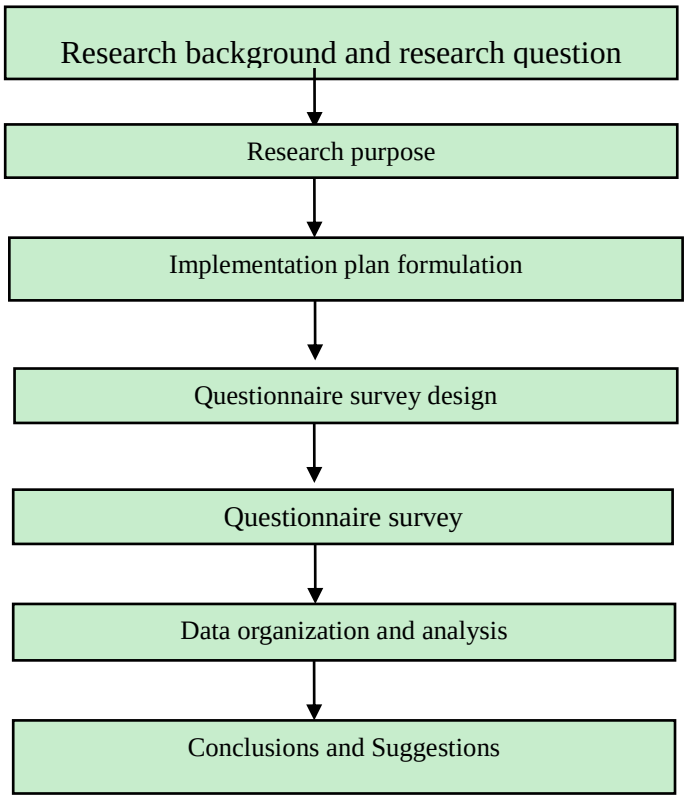
Chapter 3: Research methods, where research subjects, research methods, research tools, quality control, data analysis methods, etc., are introduced.

Chapter 4: Research results, where the results of survey data are described and analysed.

Chapter 5: Research discussions, where the human resource management strategies for improving hospital employee satisfaction and engagement are discussed based on the above research results.

1.5 Technical roadmap

The roadmap of this research is as follows:



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Chapter 2: Literature Review

2.1 The Theory of High Performance Work System

2.1.1 The Concept of High Performance Work System

The High Performance Work System (hereinafter referred to as "HPWS") is a series of human resource management practices intended to raise the organizational performance. By introducing scientific management into its recruitment, promotion and performance assessment, the end goal is for the organization to improve its overall performance. The HPWS can raise the knowledge, the skills and the organizational commitment of the employees and thus turn them into the important source of the core competitive advantage within the organization. On the one hand, HPWS regards the people as its strategic core and integrates the employees into part of the corporate management. This should in turn increase their job engagement and job satisfaction, thus lowering their turnover rate. On the other hand, HPWS can also have an impact on the organization or individual employee through introducing a series of mediator variables such as focusing employee relationship, improving working environment or promoting employee collaboration.

Western academia currently does not have a strict definition of HPWS, as it covers a great deal of ground. There are many variations of the term, such as High Performance Work System, High Participation Work System, High Commitment Work System, Optimal Human Resource Management System, or Flexible Work System. Nadler et al. (1992) stated that HPWS "is an organizational system that can optimize the allocation of various resources while effectively meeting the needs of the market and customers and achieving high performance." Huselid et al. (1997) defined HPWS as "an internally highly unified corporation whose policies and actions serve in the best interest of its corporate strategic goals." Edwards and Wright (2001) believed that concept behind HPWS was: If the organization treated its employees nicely, they would change their working attitude and continue to raise their job satisfaction and commitment. This positive attitude would continue to affect behavior and ultimately help improve organizational performance. Chinese scholars Wu Zefu and Wu Jie both agreed that there is a fundamental difference between the basic model of a fundamentally sound HPWS and the hierarchy model

of a traditional corporation. By optimizing employees' knowledge, skill sets, adaptability and initiative, the HPWS is an effective, coordinated mechanism that can quickly gain competitive advantages in human-resource management practices, working organization structures, and manufacturing operation procedures. It is the organic compound of technical and social systems.

Regarding the composition of HPWS, according to the views of Bailey and Merritt (1992), the HPWS consists of three components and they are human resource practices that provide the employees with the opportunity to participate in making decision while equipping the workforce with the skills and incentive to participate effectively. MacDuffie (1995) also stated that in order for human resource practices to improve organizational performance, they must contain three elements: First, the employees must retain certain knowledge and skills. Second, the human resource management practices must be able to motivate the employees to fully make use of knowledge and skills. Third, the organization must enable its employees to achieve goals for the organization autonomously. Based on this theory, Applebaum (2000) famously introduced the high performance work system named AOM model that regarded organizational performance as a derivative function of organizational core elements. The organizational structure consisted of three main components: employee ability, employee motivation and opportunity to participate. The human resource practices from HPWS should enable the organization to elevate the three aforementioned factors. By reviewing the research conducted on high performance work system in the mid-90s in the United States, Becker and Gerhart (1996) discovered that various researches reached different conclusions on what constituted the best human resource practices that constituted a high performance work system. Scholars did not reach a clear consensus on what specific human resource practices should constitute the high performance work system for corporations (Dekok & DenHartog, 2006; Kintana, Alonso & Olaverri, 2006).

Some scholars studied the composition of a high performance work system as a human resource management practice employed in China that represented Eastern culture. Liu and Zhou (2004) summarized the typical features of a human resource management system that can bring in high organizational performance: in order to raise the ability of the employees, the organization should be meticulous about hiring new staffs and focus on providing employee training and development. In order to motivate employees, the organization should adopt a reward system that is based on staff contribution and pay close attention to its employees' career development as well as their career stability and safety. In order to create more opportunity for

the employees to participate, the organization should strive to enhance the organizational structure, the operation flow and work design. With the emphasis on promoting team culture, customer-oriented, focusing on quality, flexible manufacturing system and arrangements such as ever-improving team process, communication and information sharing mechanism, the organization should encourage its employees to engage in activities that achieve organizational goals proactively. Focusing on Chinese corporations in their research, Zhang Yichi, Huang Tao, and Li Qi conducted exploratory factor analysis on 30 human resource practices that could constitute a high performance work system. In their finding, they discovered the effectiveness of a high performance work system lied on four main criteria such as the foundation of human resource, employee participation, procedural fairness and human resource management. This finding was consistent with similar research conducted abroad that employee participation played a pivotal part in high performance human resource management system.

Zheng, et al. (2006) conducted research on 74 small- to medium-sized Chinese enterprises and discovered that the high-performance human-resource management practices included measures such as performance-based compensation, decision-making opportunities, free-market selection, and performance assessment. These four human-resource practices not only improved human-resource management, but also enhanced overall organizational performance. They also discovered that a high degree of employee commitment was a significant human-resource management factor in raising organizational performance.

Although scholars have yet to reach a clear consensus on the composition of human-resource practices within a HPWS, most believe. that meticulous recruitment and selection processes, broad development and training activities, employee participation and empowerment, and performance-based reward systems were critical components of a high-performance, human-resource management system (Beckher & Huselid, 198l Bjorkman & Fan, 2002; Kintana, Alonso & Olaverri, 2006).

2.1.2 Research on High Performance Work Systems in Hospitals

In recent years, many scholars began paying attention to applying HPWS within a specific industry while focusing on the effect of human-resource practices on organizational performance. Since Western research on HPWS originated within the manufacturing sector, scholars in China started by applying it to the manufacturing industry. As the tertiary industry continues to grow, HPWS has been incorporated into traditional service industries such as retail

and hotel, as well as knowledge-intensive service industries such as banking, securities, and insurance. Studies on these industries have shown that HPWS can raise employee performance and organizational performance to some extent. In the service industries, when customers interact with the employees, they generate instant response and feedback to the corporate service that they receive. This subjective feedback not only reflects the service that the employees provide, but also relates to the customers' degree of trust and loyalty to the corporation. Health-care is a knowledge-intensive service industry. The relationship between hospitals and patients is similar to that between employee and customer relationship in most other service industries. That means health-care professionals represent the image of the organization. When patients directly interact with health-care professionals, they not only generate feedback on the health care that they receive, but they also generate a response to the medical institution they visit. If the patients are satisfied with the service provided by their health-care professionals, they would also view the medical institution in a favorable light. If hospitals can raise health-care professionals' job satisfaction and enable them to work more proactively by adopting HPWS, thereby improving patient satisfaction, this will enhance the performance of the medical institution. Given the professional nature and the complexity of the health-care industry, a scientific management method must be introduced to raise management efficiency, while paying close attention to the job satisfaction rate of its health-care professionals. These measures will ultimately improve hospital management and be conducive to better patient health.

Recently, Siah et al (2013) used a multi-level analysis of a sample of 193 employees, matched to 58 managers, in a regional Australian hospital to examine the effects of management and employee perceptions of HPWS on human-resource outcomes. These relationships were examined across four distinct occupational groups. Their findings suggest that only when management's implementation of HPWS is similar to employees' espoused human-resource practices can HPWS be translated into greater engagement, job satisfaction, effective commitment, and less intention to leave. The results have implications for managing employees in the health-care sector and implementing HPWS for different occupations within an organization. Mihail et al. (2016) followed an employee-centric approach, based on the social and economic exchange theories, to examine the effects of HPWS on employees' work-related well-being, such as emotional exhaustion, work engagement, and job satisfaction. They used partial least squares (PLS) structural equation modeling (SEM) on a sample of 297 clinicians (doctors and nurses) across seven Greek regional hospitals. Their findings

demonstrated that HPWS effects on employee outcomes can be influenced by how they perceived the nature of the exchange relationship with their employers. Specifically, emotional exhaustion tended to decrease if employees perceived their relationship with the hospitals as a social exchange. On the other hand, an economic exchange relationship decreased the possibility that HPWS led to work engagement. More important, they found that employees' job satisfaction was negatively associated with emotional exhaustion and positively associated with work engagement.

More recent research focused on Chinese hospitals' human-resource management. Zhang and colleagues (2013) addressed the recent call to restore employees' well-being to the center of HPWS research through investigating its effects on the major dimensions of work-related well-being, such as emotional exhaustion, work engagement, and job satisfaction. Based on data collected from a sample of 207 clinicians (medical practitioners and nurses) and administration staff in six Chinese hospitals, Zhang et al. introduced the perceived nature of the employee-employer relationship as a moderator to understand the complex mechanisms through which HPWS may influence employee well-being. Given that China's health-care system is one of the most market-orientated in the world, they argued that it is an ideal site for studying the implications of human-resources practices on employees. The findings demonstrated that HPWS may lead to work engagement or emotional exhaustion, depending on employee perceptions about the nature of the employee-employer relationship. The economic-exchange perception increases the possibility that HPWS leads to emotional exhaustion, while the social exchange perception decreases the possibility that HPWS leads to employee work engagement. Their findings have significant practical implications for hospital management.

Although there are several studies focusing on Chinese hospitals studies about the adoption of HPWS in the health-care industry are still few and far between in China. For that reason, future research should focus on the application of HPWS in the health-care industry, especially on the mechanism that monitors job satisfaction of health-care professionals. In light of this situation, this research will focus on health-care professionals' current perception of HPWS and attempt to analyze its impact on job satisfaction and work engagement. It will also propose feasible ideas to improve hospital management.

2.2 Research Progress in Employee Satisfaction

2.2.1 Definition of employee satisfaction

The first study of employees' job satisfaction was conducted in the 1930s. Definitions of the term vary due to the difference in research objects, purposes and the adopted theoretical framework. The Taiwanese scholar Xu Guangzhong (1977) classified the numerous definitions of job satisfaction into three kinds. Firstly, a comprehensive definition provides a general explanation of job satisfaction, focusing on the attitude of an individual towards his or her job and relevant environments (Hoppock, 1935). This definition is characterised by the perspective of job satisfaction as a single concept, with no relation to the aspects of job satisfaction as well as the reasons for and process of its formation. Secondly, definition of expectation gap, which regards job satisfaction as the level of individual satisfaction and the gap between the expected value and the actually obtained value in specific work environments. The third definition is that of reference framework, which refers to the results obtained after the explanation of job features by individuals according to the reference framework. It focuses on individuals' emotional reactions towards the work reference dimension (Chiok Foong Loke, 2001).

The above three definitions of job satisfaction are significantly different from each other. The comprehensive definition, which highlights workers' ability to achieve overall satisfaction after self-balancing, refers to the process of individuals' psychological changes towards job satisfaction, which is difficult to accurately measure with existing methods. Besides, this concept is a unitary one, in disregard of the influences brought about by the shifts of relevant job-related factors. In comparison, the definition of expectation gap highlights the gap between job rewards and expectations, without considering the satisfaction that the job itself brings to workers. Finally, the definition of reference framework considers the individual satisfaction following the comparison and explanation of job characteristics by factors such as personal consideration and the job itself.

2.2.2 The theoretical framework of job satisfaction

Theories on job satisfaction mainly fall into one of three categories. The first is content-based theories, such as Maslow's hierarchy of needs and Herzberg's two-factor theory. These theories presume that satisfying needs and obtaining values will produce job

satisfaction. The second category contains process-based theories, such as Ferrum's expectancy theory and Adams' social comparison theory (equity theory). These theories assume that job satisfaction can be explained by studying the interactions between such variables as expectations, values, and needs. The third category covers environmental model theory, such as Quarstein et al.'s (1992) environmental event theory and Gission and Durick's (1988) prediction period theory. These theories assume that the interactions between task, organizational, and individual characteristics influence job satisfaction (Tang & Gilbert, 1995; Vroom, 1964).

The focus of job satisfaction evaluation lies in individuals' emotional reactions to job reference dimensions. This reflects the modern human-resource management philosophy of "putting people first" (Chen, 2008). The turnover intention or decisions of employees with low satisfaction creates strong instability in the organizational structure. Job satisfaction is a good indicator for predicting life expectancy. The health of employees with low satisfaction is not good. The pressure caused by job dissatisfaction may significantly increase the risk of illness and further increase the possibility of sick leave or ill-health retirement, thereby reducing the organization's initiative. Employees with high job satisfaction can bring positive effects to society. Therefore, it is very difficult to provide customers with satisfactory services without having satisfied employees. Without satisfied medical personnel, it is very difficult to create optimal treatment environments for patients. Medical personnel with high job satisfaction can actively improve their way of life and their attitude toward the lives of patients, and improve the relationship between doctors and patients.

2.2.3 Employee satisfaction measurement methods

Some instruments cannot directly measure job satisfaction, which refers to an individual's intrinsic attitudes. Different understandings of job satisfaction will also lead to different measurement methods. Job satisfaction can be measured with qualitative or quantitative methods, each of which can adopt such tools as interviews, questionnaires, and critical incidents. The questionnaire is the most common method.

A questionnaire survey mainly comes in two forms. The first is a single global rating, which only asks one question: "After overall consideration, are you satisfied with your job?" Respondents are then graded quantitatively, according to a five-point scoring standard (Chen, 2008). This measurement method is theoretically inclusive, but is not conducive to further detailed analysis, so is not commonly used in China. The most commonly used

job-satisfaction scales include the Minnesota Satisfaction Questionnaire (MSQ), the Job Diagnosis Scale (JDS), the Job Descriptive Index (JDI), the Job Satisfaction Questionnaire (JSQ), the SAR Employee Questionnaire, and self-designed scales of various studies. These scoring methods are all relatively complicated. First, the key factors influencing job satisfaction must be determined. Respondents are then asked about their feelings toward these factors, which are evaluated according to the standard scale. Finally, the total score of job satisfaction is determined through calculation (Hackman & Oldham, 1975; Martins & Proença, 2012; Spector, 1997).

Studies on the job satisfaction of hospital employees can be divided into three categories: Studies of job satisfaction and its influencing factors; studies of the result variables of job satisfaction; and studies of strategies for improving employee satisfaction.

2.2.4 Factors influencing job satisfaction

Results of extant research show that such factors as age, gender, position, educational attainment, length of service and professional title can all influence job satisfaction (Ranz, Stueve, & McQuistion, 2001). Ranz et al. (2001) conducted a survey of 286 psychiatrists and found that job satisfaction decreases as age increases. Sibbald et al. carried out three surveys among British general practitioners in 1987, 1990 and 1998, respectively, and found through comparisons that job satisfaction differs between different genders (Sibbald, Bojke, & Gravelle, 2003). Ma and Chen (2005) found through investigations among the medical staff in a hospital in Dalian City, China that salary is the most dissatisfactory aspect among employees and that satisfaction is strongly related to positions and employees of different positions have different requirements for satisfaction ((Ma & Chen, 2005). Cao and Yu (2000) surveyed the nurses of the First Clinical Medical College of China Medical University and found that there is no difference in job satisfaction between nurses of different posts, different departments, different shifts and with different purposes. Tang et al.'s (2002) investigation of medical workers in hospitals of different levels in Chengdu found that job satisfaction differs among employees with different lengths of service, educational attainments, professional titles and positions. Gao et al. (2009) discovered that there is no difference in the overall satisfaction between employees of different ages, seniority, lengths of service in the hospital and professional titles (Gao, Wang, & Zhang, 2009). Tong and Luo (2003) showed that the job satisfaction of doctors with different professional titles differs in different dimensions. The

studies by (Dowell, Westcott, McLeod, & Hamilton, 2001) and Shah (Shah, 1993) all indicated that satisfaction differs between different positions. In short, there is a correlation between general demographic characteristics and job satisfaction. However, due to differences in measurement methods, measurement tools, research locations and sociocultural levels, there are differences in the relationship strength and direction between the same person's characteristics and his/her job satisfaction. Thus, further study is necessary.

Studies have also shown that hospital human resource management might affect hospital performance through affecting the job satisfaction of the medical staff. Sound hospital human resource management policies, regulations and timetables can increase the satisfaction of medical staff and thus improve hospital overall performance. Pfaff (Pfaff, 1987) showed that the factors that influence nurses' job satisfaction are recognition, responsibility, success, progress and the job itself. Konrad et al. (1999) argued that factors affecting doctors' job satisfaction include independence, relationships between colleagues, relationships between doctors and patients, salary, resources and social status. Studies among nurses suggest that such factors will affect nurses' job satisfaction as the sense of fulfilment, job competence, recognition, positive feedback, hard-earned results being appreciated by others, engaged work being professionally challenging, sound relationships between colleagues, guarantee for salary, interests and job stability, fair working hours and a reasonable shift system. Scholars within China have also carried out relevant explorations. Tong and Luo (2003) conducted an investigation through self-designed questionnaires and found that such factors as social status, work atmosphere, workload, relative returns, work environment, job risks and job prospects may affect the job satisfaction of medical workers. Yuan and Li (2003) found, through an investigation among nurses in special medical service organisations, that the factors affecting job satisfaction include few personal development opportunities, poor compensation packages, excessive workload and few professional exchange opportunities, and the influences of each factor decrease from strong to weak (Yuan & Li, 2003). A study of grassroots health service personnel in community health service centres showed that such factors as remuneration, fairness, working conditions, social status, occupational environment and exertion of incompetence will influence job satisfaction ((Yin, Wang, & Fu, 2003; Li & Wang, 2004). Among medical personal in Level 3 hospitals, remuneration, collective cohesion and democratic management are the main factors affecting job satisfaction ((Yang, Chang, Li, Peng, & Shen, 2006). Ma and Huang (1993) and Hu et al. (1999) believed that the leaders' ways of management are highly relevant to job satisfaction.

Therefore, it is of great importance to study the inner link between strengthening hospital human resource management and the job satisfaction of medical workers (Townsend & Wilkinson, 2010).

2.2.5 Factors influencing the satisfaction of hospital employees

Among the studies conducted outside China, Konrad et al. (1999) argued that the factors influencing doctors include: Autonomy, relationships between colleagues, doctor-patient relationships, salary, resources, and social status. Piko (2003) found that nurses registered in Hungary are most dissatisfied with the salary system aspect of their work. McAlearney et al.'s (2011) study found that nurses registered in South Carolina, in the US, are most dissatisfied with the aspect of recognition/appreciation. A study among senior registered nurses in New South Wales, Australia carried out by Cowin (2002) indicated that they are most dissatisfied with job demands, followed by salary. Upenieks (2003) found that nurses are most dissatisfied with professional development opportunities. Dowell et al. (2001) and Shah (1993) suggest that employees at different positions vary in job satisfaction. Chiok Foong Loke (2001) showed that job satisfaction of hospital employees is significantly correlated to leadership behavior of the organization. A survey conducted by Ranz et al. (2001) of 286 psychiatrists showed that job satisfaction decreases as age increases. Sibbald et al. (2003) carried out three surveys among British general practitioners in 1987, 1990, and 1998. They found that job satisfaction differs between genders.

Most domestic studies have indicated that satisfaction with income distribution and benefit packages is the lowest, followed by communication and information-sharing, growth and promotion opportunities, and the staffing system. Tong and Luo (2003) argued that such factors as "social status, work atmosphere, workload, relative remuneration, work environment, job risks and job prospects" are the main aspects that influence medical workers' job satisfaction. Yang et al.'s (2006) study of medical employees in a 3A hospital in Beijing revealed that compensation packages, group cohesion, and democratic management are the main factors that influence job satisfaction. Ma and Chen (2005) surveyed medical staff in a hospital in Dalian City and found that salary is the most unsatisfactory aspect among employees and that satisfaction is strongly related to posts. Furthermore, employees at different posts have different requirements for satisfaction. Cao and Yu (2000) surveyed nurses of the First Clinical Medical College of China Medical University and found no difference in job satisfaction between nurses at different posts, departments, or shifts, and with different purposes. Tang et

al.'s (2002) investigation of medical personnel in hospitals of different levels in Chengdu revealed that job satisfaction differs among employees with different lengths of service, educational attainments, professional titles, and positions. Gao et al. (2009) discovered that there is no difference in overall satisfaction between employees of different ages, seniority, lengths of service and professional titles, while there are differences in overall satisfaction between employees with different genders, educational attainments, job positions, types of job, duties and monthly income. A study among grassroots health-care personnel in community health centers showed that factors such as remuneration, fairness, working conditions, social status, occupational environment and showing competence influence job satisfaction (Li & Wang, 2004; Yin, Wang & Fu, 2003). Ma and Huang (1993), and Hu et al. (1999) determined that management styles are highly relevant to job satisfaction.

Based on conclusions from numerous studies, the factors that influence the job satisfaction of hospital employees can be summarized into six aspects. The first is the job itself; namely, employees' interest in the job, as well as the challenges, learning opportunities, and success opportunities. The second is remuneration, not only the quantity but also about the fairness and rationality of the remuneration. The third is promotion opportunities, which motivates employees to make progress and is a reward and recognition of their efforts. The fourth factor is leadership style. While employees care if the leadership style is autocratic or democratic, they are also concerned if the leaders care for the employees themselves, as well as about production. The fifth factor is interpersonal relationships, including those between employees and their colleagues, employees and their leaders, and employees and their family. The sixth and final factor is working conditions. A good environment makes employees comfortable, advanced facilities help increase efficiency and reduce workload, and employees feel respected if their work hours and intensity follow labor laws and regulations (Gao, 2009; Ma & Chen, 2005).

Since employee satisfaction is the result of the comprehensive effect of multiple factors, research results may differ from one study to another, and employee satisfaction scores are not necessarily positively correlated to hospital performance, for several reasons. First, there are differences between hospitals because they have different employee satisfaction models and satisfaction survey standards. Second, employees' expectations change as the environment and time change. Third, hospital, patient, and employee values backgrounds vary. For example, factors such as repetitive work, shift system, absence of overtime work and work or cooperation partners with common interest are important for some individuals. For others, participation in

decision-making, flexible timetables, and good incentive rewards are the most prominent values. Fourth, some scholars hold that job satisfaction consists of positive job satisfaction and submissive job satisfaction, and that only positive job satisfaction can produce positive effects (Yin, Wang & Fu, 2003).

2.2.6 The outcome variables of hospital employee satisfaction

The effect of employee satisfaction on turnover has long been a hot research topic, but study conclusions have not been consistent. The three following views predominate. First, job satisfaction is not significantly correlated to turnover intention. Second, job satisfaction interacts with individual characteristics and organizational commitment to affect turnover intention. Third, job satisfaction directly affects turnover intention. In a meta-analysis of 58 relevant domestic and international research papers over the past decade, Liu and Qiao (2010) found that overall job satisfaction was significantly negatively correlated to turnover intention. However, each dimension of job satisfaction had different influences on manager and employee turnover. The promotion and training mechanism, interpersonal relationships, and leadership management were the most important factors for managers, but the compensation package was the most important factor for employees. Most current studies on the relationship between satisfaction and turnover intention of hospital employees focus on nurses, who believe that the compensation package exerts strong influences.

The influences of employee satisfaction on job performance have been quite controversial. Some scholars hold that satisfaction can directly provide for job performance, while others believe that performance leads to satisfaction. (Xia & Huang, 2002). Experts have proposed that employee engagement is the indicator that truly affects an enterprise's performance. In China, there have been few studies of satisfaction and job performance. Wang (2008) conducted a study of young nurses in seven 3A hospitals directly administered by the provincial government in Shijiazhuang City. Job satisfaction was positively correlated to job performance and could, to some extent, predict individual performance. On the other hand the indirect effect of job satisfaction on job performance was greater than the direct effect.

2.3 Research progress in employee engagement

"Any company that wishes to win through competition must ensure that every employee is engaged" (Macey & Schneider, 2008). Engagement refers to a kind of commitment and

dedication in emotional and knowledge aspects that employees make to the enterprise. With employees' constantly changing needs and expectations, simply increasing their satisfaction can no longer ensure sustainable and long-term development of the organization. Many experts believe that engaging employees is an important, direct factor that results in organizational success. Engaged employees have the greatest effect on organizational performance. Some experts have compared employee satisfaction to the concept of liking and organizational commitment to wanting to make contributions. On the other hand, engagement means employees want to and do make contributions. Engagement, as an expression of behavior and attitude, is closer to the term competence put forward in the recent research field of human-resource management. In this context, engagement refers to the extent to which employees can make contributions.

2.3.1 The concept and definition of engagement

Schaufeli et al. (2002) defined employee engagement as a work-related, positive, fulfilling, and complete emotional and cognitive state, which is characterized by energy, dedication, and concentration. They further noted that engagement is not an instantaneous state, but a continuous and penetrating emotional and cognitive state. It is not limited to particular affairs, events or behaviors (Schaufeli et al., 2002). The definition of employee engagement can be elaborated upon from different perspectives. According to the Gallup Organization, engagement is about enabling each employee to develop a sense of belonging and "a sense of responsibility as the master" (Rath, 2011) on the basis of creating a sound environment for employees to bring out their strengths. According to Hewitt Associates, employee engagement refers to the degree of employees' willingness to stay in the company and strive to serve the company. It is mainly reflected in three aspects: (1) Say, where employees continue to speak positively of the organisation to coworkers, potential colleagues and especially customers and they describe their organisation, coworkers and jobs with positive language under any circumstances; (2) stay, where employees have an intense sense of belonging, desire to be part of the organisation, and wish to stay in the company in the long run instead of regarding the current job as a temporary transition; and (3) strive, where employees are motivated and exert efforts toward success in their job and for the company.

With regard to different concepts of engagement, researchers have put forward corresponding ways of measurement. The essence of the various ways of measurement all lie in indicating grassroots management in latitude from two aspects: measurement and actions. In

other words, measurement is used as the basis and from measurement to management, every manager is required to take responsibility for their grassroots work environment and atmosphere. Through targeted counselling and interventions related to the measurement results, grassroots managers and employees are initiated to actively participate in improving the work environment so as to effectively increase the engagement of all employees (Xiao-hua, 2006). The present study has adopted the most widely recognised Gallup Q12 Scale and UWES-9 Scale (Utrecht work engagement scale-9) to measure employee engagement.

According to Gallup Organisation, engagement is about enabling each employee to develop a sense of belonging and "a sense of responsibility as the master" on the basis of creating a sound environment for employees to bring out their strengths. The Gallup Employee Engagement Survey formulated by researchers from Gallup Organisation, known as Gallup Q12 for short, is not a simple measurement tool. More accurately, it is a management system. GWA-Q12 was developed over a long period of 70 years based on the data collected from 12 different industries, 24 companies and over 2500 business departments, via measurement through scientific methods and in consideration of the analysis of the opinions, attitudes and behaviours of voters, consumers and employees. Its essence lies in projecting grassroots management onto latitude. In other words, measurement is regarded as the basis before the focus goes back to management from measurement. Each manager is required to be responsible for his/her own grassroots work environment and atmosphere. Through targeted guidance and interventions in connection with the measurement results, grassroots managers and employees are mobilised to participate actively in improving work environment so as to effectively increase the engagement of all staff (Xiao-hua, 2006). The questionnaire is the measurement standard for employee engagement and work environment. It is also a tool for measuring and managing a grassroots work environment. Besides, targeted interventions can be made based on the measurement results. With human-based management as its core idea, the questionnaire can reflect employees' four indicators: retention, profits, efficiency and customer satisfaction (Huang, 2012).

However, all of these models are inspirational and descriptive frameworks instead of theoretical and explanatory ones. Therefore, other theories are needed to explain the mechanisms of action behind them (Wang, 2014). At present, the main research models are as follows. (1) The key mental state model, which has its theoretical basis in role theory. It puts forward that engagement can produce three associated mental states – a sense of meaning, a sense of security and a sense of accessibility – of which the relevance of the sense of meaning is

the highest. May et al. (2004) found that work richness, job–role matching, relationship between colleagues, relationship with directors, norms between colleagues, self-awareness, resources and external activities are the main factors affecting the key mental state. (2) The innate psychological needs model, which has self-determination theory as its theoretical basis. Broeck et al. (2008) established the model, indicating that in meeting psychological needs, job resources can play a role in increasing satisfaction, whereas job requirements play a role in decreasing satisfaction. Employees determine their job engagement exactly according to the level of satisfaction. (3) The emotional transformation model, which has its theoretical basis in the self-regulation theory put forward by Bledow et al. (2011). This model assumes that employee engagement is produced as a result of the interactions under the dynamic transformation between positive and negative emotions. The Utrecht Work Engagement Scale (UWES) developed by Schaufeli et al. is the most widely used in empirical studies on employee engagement.

As seen above, engagement is a multi-dimensional construct, but there is still no consensus on which dimensions it includes or the specific connotation of each dimension. Furthermore, the research on relevant mechanisms of action is not mature. Only a few empirical studies have been conducted by Chinese scholars regarding employee engagement in China. Further research on its structure and measurement must be carried out.

2.3.2 Measurement of job engagement

2.3.2.1 Gallup-Q12 scale

The Gallup Employee Engagement Survey formulated by researchers from the Gallup Organisation (known as Gallup Q12 for short) is not a simple measurement tool; more accurately, it is a management system. Gallup established a “Gallup path” model, according to which the growth of enterprises’ fundamental profits facilitates the appreciation of shares. On this basis, sustainable growth promotes the growth of actual interests. Afterwards, customer loyalty pushes forward sustainable development, which ultimately results in continuous increase in employee engagement under the leadership of the enterprise’s management. The aim is to enable every employee to develop a sense of belonging and form a “sense of ownership”. In recent years, the Gallup Q12 Scale has been applied in the field of hospital management.

2.3.2.2 Utrecht work engagement scale (UWES)

The UWES Scale developed by Schaufeli et al. in 2002, which conducts evaluation from the perspective of job engagement, has been most widely applied in empirical studies on employee engagement. Currently, the universally recognised definition of job engagement refers to a job-related, enduring and pervasive, positive and fulfilling mental state, which is expressed in three dimensions: vitality, dedication and concentration. Vitality is the high-level mentality and psychology expressed in work. People with vitality are willing to actively engage in work, have no fear of difficult and hard work. Dedication refers to a full understanding of the meaning of work, as well as having passion for work and the willingness to invest more time and energy therein. Concentration refers to focusing attention on and being fully dedicated to work without distractions. This definition pays more attention to individuals' advantages and a sound occupational state, which is opposite to occupational burnout.

Given the increasingly tense doctor–patient relations in China, the requirements for hospital staff's job engagement, especially concentration, have grown in order to avoid malpractice and provide patients with better medical services.

Among the other scales are Hewitt's Model of Employee Engagement (formulated by Hewitt Associates), which includes 47 items under four dimensions: work, physical and mental health, individuals and atmosphere and overall returns. Each item is also called an engagement driver. According to the score ratio, these items are categorised into the dangerous zone, problem zone, stable zone and high-performance zone.

2.3.3 Relevant theories on employee engagement

In the current stage, most studies on employee engagement are carried out from the empirical aspect. Studies on employee engagement are mainly based on contract theory, motivation theory and equity theory.

Contract theory: The relationships between either enterprises or hospitals and their employees are, in essence, contract relationships. In other words, enterprises and hospitals can be understood as the combination of a set of contract relationships and a market contract between human capital and physical capital. The difference between the property characteristics of human capital and physical capital is that human capital belongs to the workers themselves (Jensen & Meckling, 1976). In the labour relationships within enterprises, there are not only economic exchanges, but also exchanges at the psychological level. In the former case, enterprises use money to exchange with workers' labour, which is specifically represented as a "labour contract". The latter case is about the mutual trust between enterprises

and workers and such trust can enable the two parties to get psychological satisfaction, which is specifically represented as a "psychological contract". The exchanges involved therein are hard to calculate and measure. The labour contract refers to the labour contract signed between the owner of key factors of labour with the enterprise, and the former exchanges the right to use such labour to the enterprise and devotes such labour to the work content specified in the contract. In contrast, a psychological contract refers to the expectations both parties have for each other that are agreed upon between the organisation and its employees in advance but are not explicitly stated (Zhu, 2008). In other words, a psychological contract has implicitness and its essential content is expectations. It is strongly subjective and is an intangible contract formed on the basis of mutual trust. It is employees' perception of the mutual responsibilities between themselves and their organisation and can have a huge influence on both the enterprise and employees. To be specific, enterprises should understand and satisfy employees' needs and expectations. Besides, it is only when employees believe that the enterprise can meet their own needs and expectations that they will be willing to make all efforts for the development of the enterprise. In a word, under the premise of the formation of a labour contract, the psychological contract will significantly affect employee engagement. After employees' psychological contracts are satisfied, their sense of identification with the enterprise will also increase and they will internalise their enterprise's development objective into the objective of their own efforts.

Motivation theory: Some scholars hold that intrinsic motivation and extrinsic motivation have strong effects on the formation of employee engagement (Zhou, 2013).

Intrinsic satisfaction theory is also called the Hierarchy of Needs Theory. It was first put forward by the American psychologist Abraham Maslow (Koltko-Rivera, 2006; Wang & Sheng, 2003). According to this theory, people's needs can be divided into five hierarchies, which are, from low to high: physiological needs (most basic needs for human existence), need for safety (personal, psychological and workplace safety), need for love/belonging (exchanges with people), need for esteem (the wish to gain one's own and other people's respect), and need for self-actualisation (the need for self-development). In general, it is only after the needs at the lower level have been met that people can pursue the needs at the higher level. However, when the realisation of the needs at higher levels will not reduce the needs at lower levels, in some sense the needs at lower levels will produce continuous effects on individuals' needs. The five different levels of needs can be roughly divided into needs at lower level and needs at higher levels. The needs at lower levels can be satisfied though external conditions, including

physiological, safety and emotional needs, whereas the needs at higher levels can only be met to some extent through internal factors, including the needs for esteem and self-actualisation. In the same period, individuals might have multiple needs, but generally, one type of needs would be at the core and the degree of that need is the strongest and will guide individual behaviours and play a dominating role. Therefore, the satisfaction of needs has significant influence on employees' job engagement. Employees can only engage in work better with increased job engagement in the course of pursuing the realisation of needs. By paying attention to employees' needs, understanding the satisfaction of employees' needs, and reasonably meeting employees' needs in light of the actual situation, enterprises can increase employees' job engagement in the course of employees' continuous pursuit and satisfaction of needs.

Extrinsic motivation theory, which refers to Two-factor Theory, was first put forward by the American behavioural scientist Frederick Herzberg and is also known as "incentive-health factor theory". The theory suggests that the factors that make employees feel satisfied generally have to do with work content and the work itself. These factors are incentive factors, and the opposite are health factors. When employees' health factors go unmet, they will have dissatisfaction with their work. But when the needs for health factors are met, efforts can only be made to eliminate employees' dissatisfaction with work. This may not only induce employees to feel satisfied with their work but also mean that their attitudes towards work are still not active. According to this theory, in order to increase employees' initiative at work, it is necessary to satisfy their needs for incentive factors and increase their satisfaction with work, and thus increase their engagement. Nevertheless, Two-factor Theory mainly judges employees' initiative with satisfaction and dissatisfaction as the criteria and such judgment are quite subjective.

Equity theory: This theory was put forward by the American psychologist Adams from the human perspective. According to this theory, everyone compares their remunerations and efforts with others' or their own past. There are three kinds of comparison results. First, their own remuneration and efforts are greater than others' or their gains from job engagement in the past, represented in that employees gain more remuneration or make less effort than in the past. In order to eliminate this kind of psychological imbalance, employees will generally take more initiative at work and devote more time, energy and effort at work; in other words, increased engagement. The second type is where remuneration and efforts are equal; in this situation, employees would regard the remunerations as fair and their initiative and engagement will not be affected. The third type is where remuneration and efforts are smaller; in this case,

employees will feel unfair and unsatisfied, causing both their initiative and engagement to decrease. Therefore, what affects the incentive effects are not only the absolute value of remunerations but also the relative values of remunerations. Thus, when enterprises and managers give rewards to employees, fairness and reasonability are very important in order to maintain the psychological balance of employees.

2.3.4 Factors influencing employee engagement

A study by Hewitt Associates found seven factors that affect employee engagement: culture and objective, growth opportunities, overall salary, quality of life, job content, relationship with leaders and interpersonal relations. Towers Perrin prioritised the factors that affected engagement as follows: care for employee benefits from senior management, job challenges, decision-making power, customer focus, career development opportunities, the company's reputation, team coordination, necessary resources for work completion, work input in the company's decision-making, and senior management's vision for future development, among others. Saks (2006) found that job engagement is significantly correlated to job characteristics; perceived organisational support is also significantly correlated to organisational engagement. Besides, job engagement is significantly correlated to job satisfaction and organisational engagement is significantly correlated to organisational commitment, turnover intention and organisational citizenship behaviour (Wang, 2008). In the meantime, factors such as demographic variables and personality traits also have some influence on engagement (Wang, Wang, & Liu, 2017). Langelaan et al. (2006) found that the engagement of extroverted employees receives higher scores, whereas that of neurotic, fractious and impatient employees gets lower scores. Hallberg et al. (2007) determined that although engagement is irrelevant to intrinsic motivation, it has a positive correlation to achievement orientation, individual initiative and thirst for knowledge.

You's (2017) investigation of medical workers in Fujian mountainous township health centres found that steps such as increasing grassroots medical personnel's sense of fulfilment, sense of belonging and professional happiness, widening their career development scope, establishing a reasonable salary system and strengthening native identity are conducive to increasing job engagement. Studies have shown that different posts and different shift systems might affect work input level (Xu, 2016a). For example, if the patients in an ICU are in critical condition and their conditions change rapidly together with a high occurrence rate of emergencies, nurses will be faced with huge pressure and high mental stress for a long time. If

such a situation continues, the nurses' work input level will be at medium or low levels. Also, a system of frequent night shifts prevents employees from getting enough sleep, which will further result in their decreased resistance, lack of concentration and failure for their work input level to reach the optimal state (Roberts & Davenport, 2010; Fang, Wang, & Li, 2013). Furthermore, investigations targeted at operating theatre nurses reveal that the nursing environment felt by nurses working on night shifts and those in the operating theatres (including participation in hospital affairs, abundance of human resource and material resources, high-quality nursing service basis, the ability and leadership style of nursing managers, cooperation between doctors and nurses) can directly affect their work input level (Jin, Hao, Sun, Xiao, & Li, 2017).

Xu et al. (2017) used the Hewitt Engagement Evaluation Model to investigate the medical personnel in 3A hospitals and found that, among the engagement drivers, the main factors contributing to increased engagement are team management ability, the strategic vision of the senior leadership, good patient reputation, care from immediate superiors and a harmonious atmosphere between colleagues (Xu, Du, Ruan, & Shao, 2017). Towers Perrin prioritised the factors affecting engagement as follows: care for employee benefits from senior management, job challenges, decision-making power, customer focus, career development opportunities, the company's possession of a sound reputation, team coordination, necessary resources for work completion, work input in the company's decision-making, the senior management's vision for future development, etc. Saks (2006) argued that job engagement is significantly correlated to job characteristics and that perceived organisational support is also significantly correlated to organisational engagement. Besides, job engagement is significantly correlated to job satisfaction and organisational engagement is significantly correlated to organisational commitment, turnover intention and organisational citizenship behaviour. Some experts hold that psychological effectiveness can increase employee engagement.

In the meantime, factors such as demographic variables and personality traits also have some influences on engagement. Langelaan et al. (2006) found that extroverted employee engagement receives higher scores whereas neurotic, fractious and impatient employees receive lower scores. Hallberg et al. (2007) showed that although engagement is not correlated to intrinsic motivation, it has a positive correlation with achievement orientation, individual imitative and thirst for knowledge. Wang et al. (2017) found that nurses' age, department and work environment can influence their engagement.

Engagement is a multi-dimensional construct, but there is still no consensus about which

dimensions it includes and the specific connotation of each dimension. Also, the research on relevant mechanisms of action is not mature. Few empirical studies have been carried out by Chinese scholars regarding employee engagement in China. Further research is also required to determine whether it is possible to put forward corresponding strategies from the perspective of human resource management so as to increase the engagement of hospital staff to the maximum extent.

With regard to the outcome variables of employee engagement, many studies hold that employee engagement is related to organisational performance. Harter et al. analysed 7939 business units in 36 companies and found that the employee engagement of different companies is significantly correlated to customer loyalty, profit margin, productivity, staff turnover rate and safe production behaviours. Moreover, the correlation of employee engagement to these factors is higher than the correlation of the employees' overall satisfaction to them (Harter, Schmidt, & Keyes, 2003).

2.3.5 Strategic study on increasing employee engagement

All three above-mentioned aspects – individual factors, organisational factors and social factors – affect employee engagement. Joint efforts need to be made from these three aspects to increase employee engagement (Bai, 2010; Feng, 2009; Kong, 2012; Li & Mu, 2014; Liu, Feng & Zheng, 2016; Zhou, 2013).

(1) Personal factors are the key to employee engagement

Employees need to strengthen their personal cultivation and increase engagement. They should read books and listen to music that cultivate their taste and refine their personal cultivation. They need to understand that work is not just to meet their basic material needs. But, more importantly, it is for their own long-term development, a more enriched life and realisation of their own life values. At work, they should have a positive mind-set, put themselves in other people's shoes and view their own work status from the perspective of hospital development (Feng & Zheng, 2016).

Employees need to adjust their own mind-sets and increase their sense of responsibility. In particular, when they encounter and unfair and unreasonable situation, they should learn to adjust their mind-sets and actively look for problems in themselves. Even though they have emotions, they must also take reasonable measures to channel them away without affecting work progress. In particular, hospital employees, who face patients and solve problems related

to patients' life and health, need to increase their sense of responsibility towards work and think about problems from the perspectives of the hospital and patients and realise the social responsibilities undertaken by their own jobs (Feng, 2009). Furthermore, employees should increase their sense of responsibility towards the organisation and be aware that obtaining their own material benefits and realising and enhancing their own values are inseparable from the successful operation and development of the hospital. In addition, the interests brought about by employees' work results are enjoyed not only by the hospital but also by employees. Therefore, hospital employees must have a strong sense of responsibility for their own jobs and complete their work with both quality and quantity (Zhou, 2013).

Employees need to continuously enhance their own knowledge and skills. Being fully equipped with the knowledge and skills relevant to work is the basic premise for engaging in work. With the development of the times as well as scientific and technological progress, knowledge of disciplines such as medicine changes continuously. Only by constantly completing their own knowledge structure and mastering new technologies and skills can employees better increasing their own work capacity, adapt to their own job roles and complete job tasks well. In the meantime, employees can also constantly maintain their own competitiveness and increase engagement (Li & Mu, 2014).

(2) Organisational factors are the guarantee for increasing engagement

Managers should foster a sound corporate culture. Corporate culture has a strong influence on employees' ideas and behaviours. Culture refers to the values and behaviour patterns that are gradually formed in the long development process of an enterprise and jointly followed by employees (Ma, 2014; Zhang, 2009). If an organisation has a culture of justice and trust, it may enable employees to form feelings of security, trust, belonging and responsibility. Employees will be enthusiastic about engaging in work with high enthusiasm, and their engagement will increase accordingly. An enterprise can carry out positive promotion and guidance among employees through various means to increase employees' sense of fairness, mutual support and sense of trust and give rewards and support to such behaviours in order to better develop its corporate culture.

Improving the management level can significantly increase employee engagement. This can be achieved by three means. The first is emotional management, in which managers' emotions are mainly relied on. Through communication, managers get to know their employees' needs for actualisation, understand and care for employees and foster a sound work

atmosphere. The second means is recognition of employees' work value, which is an important motivation for an employee to continue working hard. Paying attention to employees' progress and performance and recognising their contributions can increase their confidence and enable them to understand their important roles in hospital development, increase their identification with the organisation and thus achieve the purpose of motivating them. The third means is to provide a reasonable and effective feedback channel to ensure the effective communication between leaders and employees so that leaders can learn the problems employees face at work and discuss solutions with them. It can also enable employees to learn about the real-time updates of the enterprise, develop a sense of ownership, increase participation in various hospital work, take a more active part in their own work and increase their job engagement (Kong, 2012).

Employees should be assigned to posts reasonably, based on their ability. Wasting a person's talents on a petty job will waste human resources and may lead an employee to regard their job content as unchallenging and feel a reduced sense of fulfilment and satisfaction after achieving success (Bai, 2010). This will produce inertia, lowered initiative and decreased employee engagement. On the other hand, assigning someone to a post beyond his/her capacity might cause other problems as a result of their incompetence. Also, job content should not be too monotonous or repetitive. Rich and diverse job content can reduce job burnout and increase employee engagement.

Providing training and further study opportunities for employees and increasing job skills are ways to increase employee engagement. Training programmes with systematic objectives and detailed plans that suit the enterprise development orientation should be formulated based on employee traits to train employees and ensure both quality and quantity. Apart from increasing employees' knowledge and skills, this can also increase their adaptability to job posts, increase their confidence at work, and thus increase their job initiative, enthusiasm and engagement.

A sound salary and welfare system will satisfy employees' material needs. By increasing employees' overall salary and their sense of identification with their jobs can employee initiative be increased. According to the equity theory, salary and welfare should be kept just and fair so that employees will be willing to devote themselves wholeheartedly to their work (Pritchard, 1969). Incentive functions also need to be taken into consideration when setting up a salary system. Respective salary levels and level differences as well as the relative values between different posts should be determined according to the actual development needs of the

enterprise. For example, a performance-based salary system can be implemented to give employees respective salary remunerations according to their performance; this will motivate those employees who take the initiative at work while making the employees who adopt a negative attitude intuitively realise their gap with others and thus work harder.

Managers should formulate targeted career planning for employees. After new employees join an organisation, their employee engagement will undoubtedly increase if their career prospects and room for development can be clearly defined. Based on employees' own skills, willingness and development potential, formulating reasonable career development planning for them can increase their job motivation, clear the direction of their efforts and increase their drive for their work; this will motivate them to work hard to realise their career objectives, which will transform into increased job engagement.

(3) Social factors are the basis for increasing job engagement

The level of employee engagement is separate from the current social morality and atmosphere. A sound social environment plays a subtly dominating role in employee engagement (Shi, 2008; Wu, 2010; Wu, 2010).

Managers can increase the propaganda efforts for dedication by adopting propagandising the models of dedication that have made contributions to their posts. While increasing the influence of these methods on people, more efforts should be made to publicise the actual effects and play a positive role in motivating people to learn dedication (Chen, 2015).

The leading role of the models of dedication should be brought into full play (Zhou, 2013). In particular, government departments, especially the relevant functional departments of public service that have frequent exchanges with the public, should underline the representation of dedication. In this way, the engagement of the whole society will be increased as a result of the positive influences from the engagement of civil servants.

The state and government should strictly regulate systems and provide sound policy guidance (Yang, 2009). In addition to soft public opinion guidance, a hard regulatory system should also be established so that laws, regulations and policies can be used to regulate enterprise and employee behaviours. Unreasonable behaviours should be detected in a timely manner and reasonable means should be adopted in order to provide correct guidance that increases employees' recognition and understanding of the enterprise and enables them to fully dedicate to work with increased engagement.

Compared to hospital employee satisfaction, few studies have been conducted on hospital

employee engagement in China and most of the ones that have are concentrated on nurses' engagement. There are even fewer studies on the factors influencing engagement and satisfaction.

The reform of public hospitals should focus not only on employee satisfaction but also employee engagement. First of all, a more systematic organisation of the factors influencing engagement should be made. On the individual level, it is necessary to verify the correlation between individual differences and various dimensions of engagement. On the organisational level, organisation type, organisational structure and organisational culture can be combined to further discuss what kind of organisational environment is more conducive to cultivating and increasing employee engagement. Further research on job satisfaction, organisational commitment, job engagement as well as the relationship between employee engagement and job performance also needs to be carried out to understand the formation of employee engagement, strengthen the empirical research on improving engagement strategies and effectively apply relevant research results to serve practices.

Therefore, the present study aims to explore the relationships of HPWS and hospital employee's satisfaction and engagement in China. The research will make contributions to have a better understanding in increasing the satisfaction and engagement of hospital employees from the perspective of human resource management strategies.

2.4 The relationship between HPWS and employee job satisfaction and engagement

2.4.1 The effect of HPWS on hospital employees' job satisfaction

The concept of *job satisfaction* reveals an employee's overall view of their occupation. It is influenced by the employee's internal factors and external environmental factors. Whether or not the employee is satisfied with their job depends on their attitude about various aspects of the occupation. In general, job satisfaction rates can affect various issues such as team cohesion, leadership and turnover rate. Job satisfaction reflects the employee's attitude about their working situation and reveals their psychological and physical response to the working environment. It is reflected in the job's nature, compensation, and the relationship between managers and their workers.

Based on the perspective of social exchange, Miao Rentao introduced the theory of

interactional justice. He treated HPWS as an independent variable, while leaving *employee attitude* (broken down into *job satisfaction*, *organizational commitment*, and *organizational trust*) as a dependent variable, and explored the former variable's effect on the latter. He discovered that the HPWS increased trust between the corporation and its employees, generating a mutually beneficial reciprocal model that helps develop a psychological bond. Meanwhile, the HPWS can indirectly reverse the relationship between managers and workers, strengthening the positive effect on employees' attitude. The interactional justice can considerably improve the relationship between the HPWS and both managers and their employees. Some research has shown that increased job satisfaction will effectively lead to a rise in organizational performance, given employee job satisfaction as the mediator variable in constructing an HPWS.

At the moment, most of the research conducted on HPWS is restricted to the corporate sector. Very little relevant research has been done within the health-care sector. Given the unique environment of the health-care industry, and the complexity of tasks carried out by health-care professionals, job satisfaction not only affects health-care professionals' own health and career development, but also affects their relationships with their patients. It also affects the health of their patients and the development of the health-care industry. When analyzing the correlations between job satisfaction of health-care professionals working in emergency hospitals, the quality of their health care and their team work, a healthy relationship among the medical staff was conducive to better health-care quality and lower health-care costs. There is very little research dedicated to this topic abroad. Scholars like Mihail and Kloutsiniotis reviewed how HPWS affected the job satisfaction of 297 doctors and nurses working in seven Greek hospitals in Greece. They divided the systems into seven metrics, starting with *recruitment*, *hiring*, *training* and *career development*. They then divided the metric of *job happiness* into three categories: *Job burnout*, *work engagement*, and *job satisfaction*. They discovered a positive correlation between HPWS and work engagement, as well as with job satisfaction. The health-care professionals' perception of their relationship with their hospitals (social exchange and economic exchange) has a significant effect on how HPWS influences job involvement and job satisfaction.

Based on the above findings, this research will investigate the relationship between HPWS and hospital employees' job satisfaction.

2.4.2 The impact of high performance work system on hospital employee's work engagement

William Kahn was the first to introduce the concept of *employee engagement*. When employees have high work engagement, they exert more energy into their work roles and show the best version of themselves. Conversely, employees distance themselves from their work roles and are unwilling to perform at the level required from their roles when they have low work engagement. They might even want to quit their jobs. Some scholars have classified employee engagement into three main categories that include *energy*, i*nvolvement*, and *efficacy*. Wilmar Schaufeli interviewed many employees with high job engagement and defined it as a positive and enriched psychological state that included three metrics: *Vigor*, *dedication*, and *absorption*.

Research related to employee engagement has found that the main source of engagement comes from the employee's discovery of job incentive. The employee's internal job incentive directly affects if they can fit into, or detach from, their role at work. Past research that tried to explain how HPWS affected employee engagement often used the theoretical framework of social exchange and ignored the system's motivating effect on the employee's discovery of job incentive. As an autonomous incentive, the internal job incentive emphasized how individuals voluntarily act out of internal satisfaction. The self-determination theory suggests that when employees' emotional needs are fully satisfied from being autonomous and capable at work, their job incentive adjustment mechanism would lean toward coming from within. The employee empowerment and participation policy (such as job autonomy and opportunities to make decisions) from the HPWS would enable them to fully experience free will and strengthen the experience of exerting self-control and psychological freedom at work. Meanwhile, the policy and practice aimed at improving employee skills (such as providing extensive training) from the HPWS not only can improve employee knowledge and skills, but also raise their confidence and sense of efficacy. This should ensure the employees fully realize their potentials and enable them to experience the sense of can-do. Additionally, the employee-motivational policy and practice (such as result-oriented performance assessment and career development) not only reveal the organization's recognition and appreciation of employees' work, but also foster a stronger relationship. The employees will find a strong sense of belonging in this inspiring, harmonious environment. Based on the self-determination theory, in which the employees' emotional needs are fully satisfied from being autonomous and

capable at work, this would generate a direct incentive to inspire internal job motivation. In doing so, employees would find their work interesting and important, better fit into their roles at work, and show more dedication. Furthermore, research shows that employees who are motivated by internal factors tend to be more perceptive and diligent at work. They work more proactively and remain focused over time. Based on the discussion above, we can deduce that the series of policies and practices from HPWS can enable employees to express themselves through work and fully realize their potentials. As a result, they are fully compatible with their roles at work and display much higher job engagement.

Based on the above findings, this research will investigate the relationship between HPWS and hospital employees' work engagement.

2.5 The impact of demographic variables on hospital employee's job satisfaction and work engagement

2.5.1 The impact of demographic variables on hospital employee's job satisfaction

Some existing research show that such factors as age, gender, position, educational attainment, length of service and professional title can all influence job satisfaction (Ranz, Stueve, & McQuistion, 2001). Ranz et al. (2001) conducted a survey of 286 psychiatrists and found that job satisfaction decreases as age increases. Sibbald et al. carried out three surveys among British general practitioners in 1987, 1990 and 1998, respectively, and found through comparisons that job satisfaction differs between different genders (Sibbald, Bojke & Gravelle, 2003). Tang et al.'s (2002) investigation of medical workers in hospitals of different levels in Chengdu found that job satisfaction differs among employees with different lengths of service, educational attainments, professional titles and positions.

Thus, this research will investigate the relationship between the demographic variables such as position, sex, marital status, and education background and hospital employee's job satisfaction.

2.5.2 The impact of demographic variables on hospital employee's work engagement

Factors such as demographic variables and personality traits also influence engagement (Wang, Wang & Liu, 2017). Langelaan et al. (2006) found that engaging extroverted employees receives higher scores, whereas engaging neurotic, fractious, and impatient employees gets

lower scores. Hallberg et al. (2007) determined that, although engagement is irrelevant to intrinsic motivation, it positively correlates to achievement orientation, individual initiative, and thirst for knowledge. You's (2017) investigation of medical workers in the Fujian mountainous township's health centers found that steps, such as increasing grassroots medical personnel's sense of fulfillment, belonging and professional happiness; widening their career development scope; establishing a reasonable salary system; and strengthening native identity were conducive to increasing job engagement. Studies have shown that different posts and different shift systems might affect work input level (Xu, 2016b). For example, if the patients in an ICU are in critical condition that rapidly changes, with a high occurrence rate of emergencies, nurses are faced with huge pressure and high mental stress for a long time. If such a situation continues, their work input levels will be at medium or low levels. A system of frequent night shifts also prevents employees from getting enough sleep, which will further result in decreased resistance, lack of concentration, and failure of work input levels to reach the optimal state (Fang, Wang & Li, 2013; Roberts & Davenport, 2010). Furthermore, investigations targeted at operating room nurses show that the environment for nurses working on night shifts and those in the operating room (including participation in hospital affairs, abundance of human and material resources, high-quality nursing service basis, the ability and leadership style of nursing managers, and cooperation between doctors and nurses) can directly affect work input levels (Jin et al., 2017). Therefore, this research will investigate the relationship between demographic variables, such as position, sex, marital status, and educational background, and hospital employees' work engagement.

2.6 Hospital management and the HRM of hospital in China

2.6.1 Hospital management in China

The changes in the Chinese hospital sector have been remarkable over the past 40 years (Sarah, et al, 2014). In the late 1970s, local governments were given the responsibility for health care, resulting in financing public facilities from user fees for medicine and services. In the late 1980s, public hospitals were permitted to retain profits from selling medicine and services for investments and operational costs, although the government still controlled staffing numbers and beds. The reforms during this period primarily aimed to limit government financial input into the health-care system. By 2003, higher levels of government input were

needed to ensure access to basic public-health and essential services. In 2009, the Chinese government implemented comprehensive health-care reforms nationwide to achieve universal coverage by 2020 (Communist Party of China Central Committee and the State Council 2009a). Between 2009 and 2011, reforms focused on expanding health insurance and the social safety net, access to essential medicines, reconstructing the primary care system, equal access to public-health services, and changes in the organization and financing of public hospitals on a pilot basis (Communist Party of China Central Committee and the State Council 2009b).

However, policies regarding hospital organization face certain limitations and constraints in China. Although hospitals now enjoy considerable autonomy in their use of private revenues, their governance continues to follow the traditional public-sector model. The government still allocates and controls hospital funds. Personnel management is still subject to central public-sector controls over staffing structures and grades. Intervention from higher levels of government continues, despite autonomous status. There is a lack of plurality in hospital provision. In many areas, there is little competition among providers. Many hospitals face a wide variety of problems, including:

(1) Lack of training of hospital management in ways to improve leadership and management skills such as communication, facilitation, problem-solving;

(2) Increasing number of administrative units having ambiguous functions, thereby burdening management structure;

(3) Unclear delineation of personal responsibility and lack of participative work style among some staff;

(4) Lack of specialized training of hospital management in quality management;

(5) Lack of collaboration with hospitals both in the country and abroad.

Because of these problems, the hospitals are not well-run. For example, some staff did not perform actively or effectively, and a few come to the hospital to pass the time, rather than to work. Ambiguity in the roles of some departments often led to interdepartmental conflicts and widened the gap between management and medical professionals. As a result, there have been occasions when a decision of the hospital committee, however good, could not be satisfactorily implemented, or simply wasn’t implemented at all. In addition, there has been little awareness of the need for better quality management. For example, there have been instances of duplicate medical equipment purchases. All these factors have resulted in substantial waste of both human and financial resources.

In 2017, the Chinese government released a guideline on establishing a modern hospital

management system to deal with these issues. According to the guideline, the new system should focus on serving people's diversified needs in health care with affordable, fair, and inclusive services. Meanwhile, public hospitals should maintain their nonprofit status under the direction and supervision of governments. It is projected that by 2020, a modern hospital management system with clear responsibilities, scientific management, efficient operation and effective supervision will be established. To upgrade the current management system, every hospital should formulate its own charter to clarify its nature, direction, funding sources, and rights and liabilities of its employees. The decision-making mechanism should also be improved, with hospital directors responsible for all matters related to medical care, education, scientific research and administration, while decisions should be made through work meetings.

In addition, the management of medical care safety and human resources should be improved with better finances, assets management, and performance assessment in place. Talent training and scientific research are also highlighted in the guideline to raise competitiveness and treatment. According to the guideline, governments should exercise power in governance, development, key decision-making, assets, and other major matters, while allowing hospitals to decide their organizational structure, recruitment, and other operational affairs. Governments should also enhance supervision of medical care quality, fees, prescription drugs, and illegal behaviors. Meanwhile, hospitals must enhance their self-discipline, and release information on quality, safety, pricing, financial status, performance assessment, and other key matters for public supervision.

2.6.2 The HRM of hospital in China

Hospitals are key elements of health-care systems, not only because they acquire the largest portion of public finances allocated for health-care providers, but also because they deliver services that cannot be provided by other entities, such as emergency care (McKee & Healy, 2002). Furthermore, hospitals employ the largest part of medical personnel that is engaged in the health-care system, especially physicians and nurses (Eurostat, 2016). Human-resource management takes on special meaning within hospitals, as personnel have a direct impact on the quality and effectiveness of medical services. Obviously, the quantitative aspect of human resources – the number of staff employed in the medical sphere with the qualifications vital for providing medical services – is not without significance.

Against the background of increasing competitive intensity and financial austerity, hospitals in China are confronted with the dual challenge of improving quality and reducing

costs. At the same time, many hospitals are plagued by a shortage of clinical staff and increased work intensity, making an effective response to such challenges all the more difficult. Practitioners and scholars have turned their attention to human-resource management to enable hospitals to better deal with the issues they face (Casimir & Fraser 2007). Several years ago, the National Health Personnel Conference put forward a goal of health-system personnel reform. The policy aimed for the public health-care sector to establish a new administrative system, supervised by the government, which will include: increased autonomy of health organizations to manage personnel; free selection of work units by individuals; open labor recruitment and dismissal; performance-based promotion and remuneration; and organizational autonomy in relation to establishing staff. Two key features of Chinese hospital human-resource management are listed below:

(1) Staff remuneration. Staff remuneration in Chinese hospitals generally includes the basic salary, bonus payments and social welfare benefits such as housing and medical care. The basic salary depends on a person's professional title or grade and experience according to standards which are set by the central government. Some hospitals can now pay workers bonuses on top of their state-determined salaries. There are three main features of the bonus system: first, there is no upper limit on bonus payments; second, bonus payments are not uniform across the hospital but depend on the revenue-raising capabilities of individual departments; and third, bonus payments are not automatic, staff who are not seen as hard working or who work in departments which do not earn much revenue will not necessarily receive bonus payments. The responsibility of the work of medical staff compared with other professions is much greater, but traditionally they have actually earned less because basic salaries are so low. To rectify this situation hospitals have elected to pay relatively large bonuses linked to work performance with a view to creating stronger work incentives. Bonuses have become a large part of salaries in the health sector (in some cases twice the basic salary) and the bonus system has become a major form of staff motivation in Chinese hospitals. The bonus system aroused the initial enthusiasm of hospital staff as it allowed them to receive a much higher total income, and the principle of bonus payments linked to work performance was supported particularly by departmental managers. However, under this motivation, some medical workers may seek economic gain at the expense of their professional responsibility and medical ethics. They invested their energy and time in considering ways to maximise their incomes rather than providing high quality medical care or upgrading their professional skills.

(2) Staffing issues. Government personnel authorities, until recently, retained close

control over staffing decisions in the health sector. Hospitals had a fixed quota for staff establishment and hiring and firing had to be authorised by the local personnel bureau and the health bureau. Every year, in addition to accepting college and university graduates, hospitals were required to take personnel from other organisations and retired soldiers. Also, hospitals are still responsible for the whole of life and family welfare of their employees; not only paying their salaries, but also providing accommodation, social welfare and medical care. The size and makeup of the staff establishment was a related issue. Although managers were responsible for expenditure they had no control over how many staff they employed or the proportion of medical to administrative staff. Hospitals were allocated a fixed number of staffs by the responsible government bureau. They were not permitted to discharge staff even if they were over-staffed nor could they recruit new staff if they were short-staffed.

In sum, China has a major capacity-building task as it moves away from direct government administration of personnel functions in the health sector to vesting these responsibilities within the health care organisations themselves. Developing effective human resource management within the health system will involve new procedures, rules and norms in human resource planning and personnel management including staff recruitment and termination. This will involve not just documenting and announcing a new set of procedures, but cultivating respect for the efficiency, fairness and accountability of the new arrangements and a general commitment to playing by these new rules. Clearly human resource management techniques and approaches have much to offer in terms of creating a high performance workplace. A move to improved HRM practices and personnel reform in Chinese hospitals is to be welcomed but it needs to be done in a framework that sets directions centrally, while allowing flexibility at the local level.

Chapter 3: Research Design and Research Methods

3.1 Research aims and objectives

Based on the research gap found in the literature review and the current situation identified in human-resource management in Chinese hospitals (especially in Shenzhen), the study aims to examine how human-resource management strategy affects employees' job satisfaction and work engagement. Consequently, human-resource management should implement the best management strategy to improve medical staff's job satisfaction and work engagement, provide quality services to patients, and ultimately improve patients' and their families' satisfaction with the hospital.

Objectives:

(1) To investigate the current status of employees' job satisfaction and work engagement in the hospital;

(2) To understand employees' attitudes and perceptions of the human resource management in the hospital;

(3) Based on the results of this study predicates the possible relationship among human resource management strategy, employees' job satisfaction and work engagement. Implement strategies to improve employee' job satisfaction and work engagement from the perspective of human resource management.

3.2 Samples and participants

Employees of Shenzhen Maternal and Child Health Hospital were the respondents for this study. Five types of positions were surveyed: Doctors, nurses, medical technicians, management personnel, and logistics workers. The inclusion criteria were (1) on-the-job employees of the hospital and (2) those who signed the informed consent. The exclusion criteria were (1) employees who were on sick, personal, or maternal leave during the period of investigation;, (2) employees who were receiving training or doing an internship in the hospital during the period of investigation; and (3) those who did not sign the informed consent.

3.2.1 An overview of the Shenzhen maternity and child healthcare hospital

Founded in 1979, the Shenzhen Maternity and Child Healthcare Hospital is a sub-provincial level institution that specializes in maternity and child healthcare, health care, prevention, scientific research and education. Certified by the government to be a Grade 3 Class A maternity and child healthcare institution in 2011, it occupies total floor area of 35,000 ㎡ and its buildings cover a total area of 75,000 ㎡. The hospital boasts 600 beds but actually operates 656 beds with a usage rate of over 110%. By the end of 2017, the Shenzhen Maternity and Child Healthcare Hospital had 1683 health care professionals, 906 of them were on the regular payroll, which accounted for 53% of the total headcount, 777 of them were temporary staff, which accounted for 47% of the total headcount. The breakdown of the employees is as follows:

(1) Breakdown of educational background: 307 staffs with postgraduate degree, 18% of total headcount, 605 staffs with bachelor degree, 36% of total headcount, 771 staffs with associate degree or below, 46% of total headcount, and 54% of employees with bachelor degree or above.

(2) Breakdown of positions: For the health care staff, 1510 health professionals are specialized professionals, 90% of total headcount, 35 staffs are management, 2% of total headcount, 131 employees are workers, 8% of the total headcount.

For the 1510 specialized professionals, 553 of them are doctors, which accounts for 37% of the total. 711 staff are nurses, which accounts for 47% of the total. 66 staff are pharmacists, which accounts for 4% of the total. 165 staff are medical assistants, which accounts for 11% of the total. 15 staff are other technical professionals, which accounts for 1% of the total.

By the end of 2017, the Shenzhen Maternity and Child Healthcare Hospital's outpatient and emergency department received 1.749197 million visits in 2017. 51,469 patients have been discharged from the hospital, 32,081 surgeries (5,567 surgeries are tier 3-4 surgeries) have been performed at the hospital. The total number of days used for bed totalled 292,630. The usage rate of bed was 1.22% and the turnover rate of bed was 78.

3.2.2 The human resource management practices of the Shenzhen maternity and child healthcare hospital

(1) *Position management*. In 2008, the hospital underwent a thorough review of all the job positions and specified the relationship between each position's job responsibilities. It also

optimized the entire workflow.

(2) *Set up of recruitment system*. Recruitment is one of the main tasks of the hospital's human resource department. Based on the needs of the hospital's development, the human resource department carefully reviews all the positions that need to be filled and draw up relevant qualifications. They propose the criteria in terms of education background, skills and qualifications and roll out recruitment terms and conditions. They are also responsible for disseminating recruitment notices and ensuring that the positions are filled with the right candidates.

(3) *Selection and recruitment system.* Managing the hospital is a coordinated effort between all the functional departments and professional departments. For that reason, the hospital regards the heads of these departments as middle management. Selecting these department heads depends on the features of these departments, so the hospital should designate relevant criteria to pick the best candidates to lead these departments. On the one hand, the hospital can ensure smooth operation by selecting top-notch individuals. On the other hand, when employees are rewarded for taking more responsibility, they would show their true value and derive more job satisfaction.

(4) *Managing appointing professional rank.* In order to reflect the attributes of the professional staff, the hospital should designate relevant criteria of qualifications, based on the technical features of each professional field; so that the health-care professionals can receive the professional rank they deserve and receive compensation accordingly. This would enable the employees to show the true value of their professional expertise.

(5) *Employee training system*. There are two types of on-the-job employee training that the hospital provides, either for new or current employees. When new employees study the rules and regulations of the hospital, they become familiar with the hospital's operation more quickly. They also build confidence more quickly by receiving on-the job professional training. Current employees should take internal courses and overseas study programs, and organize academic conferences to improve their professional skills, work efficiency, and management ability. When employees can show their true value, they will be pleased with their self-development.

(6) *Performance management*. Based on the requests of the management team and the characteristics of each department, the hospital should set overall goals for each department and use them as guides to assess performance.

(7) *Remuneration management*. Remuneration management basically covers the position

salary, salary scale, performance-based salary, allowance, and subsidy. The position salary consists of 13 tiers within the professional positions. The administrative management position consists of 10 tiers, whereas the worker position consists of 5 tiers. The ordinary worker position does not have any tier classification. As for the salary scale, the professional and administrative management positions both have 65 tiers, while the worker position has 40 tiers. The standard for nurses' salary scale was revised upward by 10%.

In particular, performance-based salary management is based on each department accomplishing their goals and allocating certain funds for each department to distribute. For this portion, each department decides the portion each staff can receive, based on their contribution. This should reflect the parity of more work equals more reward. The allowance and subsidy are given to the employee, based on relevant state policy.

3.2.3 The human resource management challenge faced by the Shenzhen maternity and child healthcare hospital

(1) Current dilemma

First, the hospital has always specialized in gynecology and obstetrics, as well as pediatrics. The gynecology and obstetrics department undertakes some of the riskier tasks in the health-care industry, and the total number of deliveries there is within the top 3 in the nation. The enormous amount of workload means that clinical staff is under massive pressure. Second, the gynecology and obstetrics, and pediatrics departments have trouble recruiting employees. Third, employees show little initiative to engage in advanced studies. Fourth, the performance-based compensation system is relatively outdated. Fifth, the application of human resources is unbalanced.

(2) Existing issues

Massive amount of health care workload. The enormous workload requires more human resources and more allocated space. Since the national birth-control policy has been revised, many more women and children have demand for the hospital's services. According to Shenzhen Statistic Bureau (2017), the birth rate in Shenzhen reached a peak in 2016 as a result of the second child policy. The current number of staff and office space can no longer meet the rising demand. Second, the original information-technology (IT) infrastructure cannot keep up with the development of the hospital's new IT system. The clinical work is affected and cannot

meet the demands of modernized hospital management. The human-resource management measures are also constrained by this limitation. Third, the policy lags behind attracting top-class professionals. As the hospital continues to expand, it needs to attract more top-class professionals to fill the spaces on its payroll. Since the government does not provide compelling policy support, health-care professionals have practical issues to solve, such as housing accommodation, education for their children, and finding jobs for their partners. As a result, the hospital has a hard time recruiting new staff.

3.3 Investigation method

3.3.1 Sampling method

Guided by Alan Dutka's sample size predication model, with a 5 % margin of error and a 95 % confidence interval (Wang and Gao, 2005), at least 385 participants should be included to represent the whole group. Considering that the response would not be 100 percent, an 80 percent response rate was used to calculate the sample size. Therefore, the estimated sample size would be 481. Finally, the names of 500 on-the-job employees were drawn as the respondents for this study. To reduce potential bias and increase study credibility, a random sampling would be convincing for generalizing the result (Houser, 2007). Therefore, this research adopted a complete random sampling for a general survey by entering all the on-the-job employees into a random number generator with the help of statistician at the hospital. A name list of the randomized selected employees was generated.

3.3.2 Access

The study received ethical approval from the Ethical Committee of Shenzhen Maternity and Child Healthcare Hospital. Informed consent was given during the process of recruitment.

3.3.3 Recruitment and data collection

The researcher divided randomized selected employees into groups, according to their working department. Before the survey started, they had sound communication with relevant leaders of the hospital to gain their support and assistance. The hospital then issued a notice informing all departments of relevant matters, and gained the support and assistance of all

respondents. The researcher contacted the manager of each department and appointed a time to distribute questionnaires at the morning shift meeting, when most of the medical staff was available. The investigators, who had received standardized training, were fully aware of the content and purpose of this research. After the training, they mastered the basic, questionnaire survey techniques to assure they conducted the survey in a standardized manner. This research applied an online questionnaire survey to obtain relevant data with the help of Survey Star, a free online software program that has been widely used in recent years to create online surveys. By downloading the scan code or the uniform resource locator and sharing with participants, it is easy to share the questionnaire with study participants.

Before the distribution of the questionnaire, the purpose of this study was explained to participants who were selected by the generator. To control the quality of the survey, each IP address was restricted to submit the questionnaire only once. Each questionnaire was automatically coded with a number. Participant names could not be identified from the questionnaire. Participants' demographic information was collected as potential factors to analyze the correlation among job satisfaction and work engagement and perceptions toward human-resource management. The completion of the questionnaire was regarded as the agreement of informed consent

3.4 Questionnaire formulation

The questionnaire contains 4 parts: (1) basic information of the respondents, including gender, length of service, marital status, monthly income, position, professional title, age, etc.; (2) human resource management situation: high-performance work systems (HPWS) were adopted for evaluation; (3) employee satisfaction: the Minnesota Satisfaction Questionnaire (MSQ) was used for evaluation; (4) employee engagement: Gallup Q12 and Utrecht-9 Work Engagement Scalte-9 (UWES-9) were employed to make evaluation.

3.4.1 High-performance work systems (HPWS)

HPWS contains a set of independent and inter-related human resource management practices aimed at strengthening employees' skills and job engagement, mainly involving aspects such as flexible job, assignments, rigorous and selective staffing, extensive training and development, developmental and merit-based performance appraisal, competitive compensation, and extensive benefits. This system has been widely applied in relevant fields

(Huselid, 1995; Way, 2002; Datta, Guthrie, & Wright, 2005). Existing studies suggest that there is a positive correlation between the HPWS system and organisational performance. Under the situation of reasonable utilisation, the inter-relation can transfer human resources into competitive advantages and continuously improve enterprises' productivity and product quality. It can develop into a work system characterised by high trust, high employee engagement and high commitment so as to develop competitive advantages for the long-term and sustainable development of enterprises (Arthur, 1994; Huselid, 1995; Batt, 2002; Way, 2002; Zacharatos, Barling, & Iverson, 2005).

HPWS is a human resource management model that is commonly adopted by domestic and international hospitals. The model highlights the characteristics of employee development, skills training, organisational commitment, job quality and full realisation of people's potential and carries out scientific management of all links of the organisation, including recruitment, promotion, performance appraisal and salary so as to achieve the ultimate aim of improving organisational performance (Jiang & Liu, 2015). HPWS – which regards people in the organisation as the strategic core, guides employees to participate in enterprise management in an orderly manner and increases their job engagement and satisfaction – refers to a highly consistent series of policies and activities in the hospital to ensure that the human resources serve the organisation's strategic objectives (Dong, Lin, Liu, & Zhang, 2015; Fang, Huang, & Du, 2017).

The present research uses the hospital employees' understanding of hospital human resources to measure the hospital's human resource management level. Following a literature study, the HPWS developed by Takeuchi et al. was selected (Takeuchi, Lepak, Wang, & Takeuchi, 2007), which is targeted at employees' HPWS perception among Japanese people to evaluate employees' evaluation of a certain hospital's human resource management status. The scale contains 21 items, involving recruitment and selection, training and promotion, participation in decision-making, performance appraisal, job duties and teamwork. It uses a seven-level scoring evaluation. The greater the value is, the higher conformity the hospital has with regard to the content under the item (strongly disagree = 1; disagree = 2; slightly disagree = 3; neither disagree nor agree = 4; slightly agree = 5; agree = 6; strongly agree = 7). The overall reliability of the scale Cronbach's coefficient is 0.90.

The specific items include:

Q1. Employees are involved in job rotation.

Q2. Employees are empowered to make decisions.

Q3. Jobs are designed around their individual skills and capabilities.

Q4. Selection is comprehensive (uses interviews, tests, etc.).

Q5. Selection emphasises their ability to collaborate and work in teams.

Q6. Selection involves screening many job candidates.

Q7. Selection focuses on selecting the best all-around candidate, regardless of the specific job.

Q8. Selection emphasises promotion from within.

Q9. Selection places priority on their potential to learn (e.g., aptitude).

Q10. Training is continuous.

Q11. Training programmes are comprehensive.

Q12. Training programmes strive to develop firm-specific skills and knowledge.

Q13. The training programmes emphasise on-the-job experiences.

Q14. Performance is based on objective, quantifiable results.

Q15. Performance appraisals include management by objective with mutual goal setting.

Q16. Performance appraisals include developmental feedback.

Q17. Incentives are based on team performance.

Q18. Compensation packages include an extensive benefits package.

Q19. Compensation includes high wages.

Q20. The incentive system is tied to skill-based pay.

Q21. Compensation is contingent on performance.

The scale contains 21 items in total, involving such dimensions as recruitment and selection, training and promotion, participation in decision-making, performance appraisal, job responsibilities, and teamwork. However, the original literature did not provide the definitions and classification method for different dimensions. Therefore, the present study adopts the factor analysis method and carries out a structural validity test based on the survey data of this research.

3.4.2 Minnesota satisfaction questionnaire (MSQ)

The MSQ was formulated by Weiss et al. in 1967 to measure employees' overall job satisfaction. This research adopts a short-form MSQ to evaluate employee satisfaction (Weiss, Dawis, & England, 1967; Martins & Proença, 2012) and can measure the integrity of job satisfaction completely. Every question of MSQ described one reinforce in the work

environment, whereas the samples point out the respondent's degree of satisfaction with reinforce. Likert's five-level scoring method was adopted, where the score ranges from 1 to 5. Specifically, 1 ="I am very dissatisfied with this aspect of my job", 2 = "I am dissatisfied with this aspect of my job", 3 = "I am neither dissatisfied nor satisfied with this aspect of my job", 4 = "I am satisfied with this aspect of my job", and 5 = "I am very satisfied with this aspect of my job". The questionnaire, which boasts high reliability and validity, is an internationally recognised common tool for measuring job satisfaction (Zhao, 2008; Dong et al., 2017).

The questionnaire contains 20 items under four dimensions. The first dimension is intrinsic satisfaction, which refers to the degree of satisfaction with the social nature of the job, covering the satisfaction with the moral value of the job itself, the service nature, relationships among colleagues and praises received due to job performance. The higher the score, the higher intrinsic satisfaction employees have with their jobs. This dimension consists of questions 1, 2, 4, 11, 19 and 20. The second dimension is extrinsic satisfaction, which consists of seven items and refers to the degree of satisfaction with job performance and evaluation. The higher the score, the higher satisfaction employees have with the jobs themselves. This dimension consists of questions 5, 6, 12, 13, 17 and 18. Third is job autonomy, which consists of four items and refers to the opportunities to try to use own one's methods to deal with things or the opportunity to freely use one's own judgment or the opportunity to serve others as well as the degree of unlikeliness to violate moral principles. The higher the score, the higher job autonomy opportunities employees have. This dimension consists of questions 7, 9, 15 and 16. The fourth and final dimension is job development prospects, which consist of four items and refers to the satisfaction with the current stability of the job and the future development of the job. The higher the score, the greater the satisfaction employees have with their job development prospects. The Chinese version of MSQ has been widely used. Zeng (2007) employed MSQ to detect clinical doctors' job satisfaction in urban, public hospitals in Shandong. Liu (2015) also used MSQ to evaluate doctors' job satisfaction in a tertiary hospital in Guangzhou. These studies suggest that MSQ is a valid scale to measure employees' job satisfaction in hospitals in a Chinese context. This dimension consists of questions 3, 8, 10 and 14.

The specific items are as follows:

Q1. Being able to keep busy all the time.

Q2. The chance to work alone on the job.

Q3. The chance to do different things from time to time.

Q4. The chance to be "somebody" in the community.

Q5. The way my boss handles his/her workers.

Q6. The competence of my supervisor in making decisions.

Q7. Being able to do things that don't go against my conscience.

Q8. The way my job provides for steady employment.

Q9. The chance to do things for other people.

Q10. The chance to tell people what to do.

Q11. The chance to do something that makes use of my abilities.

Q12. The way company policies are put into practice.

Q13. My pay and the amount of work I do.

Q14. The chances for advancement on this job.

Q15. The freedom to use my own judgment.

Q16. The chance to try my own methods of doing the job.

Q17. The working conditions.

Q18. The way my co-workers get along with each other.

Q19. The praise I get for doing a good job.

Q20. The feeling of accomplishment I get from the job.

3.4.3 Gallup workplace audit-Q12 (GWA-Q12)

GWA-Q12 was developed by the American Gallup Organisation over 70 years based on the data collected from 12 different industries, 24 companies and over 2500 business departments, via measurement through scientific methods and in consideration of the analysis of the opinions, attitudes and behaviours of voters, consumers and employees. The questionnaire is the measurement standard for employee engagement and work environment. It is also a tool for measuring and managing a grassroots work environment. Besides, targeted interventions can be made based on the measurement results. With human-based management as its core idea, the questionnaire can reflect employees' four tough indicators, which are retention, profits, efficiency and customer satisfaction (Huang, 2012).

The present study used a questionnaire to evaluate employee engagement. In total, the questionnaire contained 12 items under four dimensions: (1) basic job requirements: Questions 1 and 2; (2) support from management: Questions 3, 4, 5 and 6; (3) teamwork: Questions 7, 8, 9 and 10; and (4) joint development: Questions 11 and 12. All items use the five-level scoring method of Likert's attitude scale. The five levels are "strongly dissatisfied", "dissatisfied", "basically satisfied", "satisfied" and "strongly satisfied", which are scored 1 to 5 points,

respectively. The higher the score, the higher the recognition of the item (Vale, 2011).

The specific items are:

Q1. I know what is expected of me at work.

Q2. I have the materials and equipment I need to do my work right.

Q3. At work, I have the opportunity to do what I do best every day.

Q4. In the last seven days, I have received recognition or praise for doing good work.

Q5. My supervisor, or someone at work, seems to care about me as a person.

Q6. There is someone at work who encourages my development.

Q7. At work, my opinions seem to count.

Q8. The mission or purpose of my company makes me feel my job is important.

Q9.My associates or fellow employees are committed to doing quality work.

Q10. I have a best friend at work.

Q11. In the last six months, someone at work has talked to me about my progress.

Q12. This last year, I have had opportunities at work to learn and grow.

3.4.4 Utrecht work engagement scale-9 (UWES-9)

UWES-9 was selected in the present study to evaluate employees' job engagement from another perspective. The scale consists of three sub-scales: vitality, dedication and concentration. Each sub-scale consists of three items, adding up to nine items in total. The overall reliability of the scale Cronbach's coefficient is 0.869. The items are presented in the form of statements. Respondents are required to give a seven-level rating of the items based on their emotions and attitudes: 0 means "never" and six means "yes, everyday" (Schaufeli, Bakker, & Salanova, 2016). The scale has been widely applied in the work engagement investigation among doctors and nurses (Li et al.; Xu, 2016b).

The nine specific items are:

Q1. At my work, I feel bursting with energy.

Q2. At my job, I feel strong and vigorous.

Q3. I am enthusiastic about my job.

Q4. My job inspires me.

Q5. When I get up in the morning, I feel like going to work.

Q6. I feel happy when I am working intensely.

Q7. I am proud of the work that I do.

Q8. I am immersed in my work.

Q9. I get carried away when I'm working.

3.5 Quality control

In order to ensure the scientific integrity and rigor of the research methods, as well as the reliability of the research results, strict quality control was exercised in the key links of the research.

3.5.1 Questionnaire design quality control

Questionnaires are the main tool for data collection of the research. The quality of questionnaires determines the quality of the data and results of this research. Through a literature study, the domestically and internationally recognised applicable and mature scale was identified as the basis. All questionnaires have been widely used in the Chinese background with well-reported reliability and validity. In addition, the reliability and validity of the scales has been retested in the study. Thus, the credibility of the study is well controlled.

3.5.2 Quality control in the data collection process

In the course of data collection of this research, there was good communication with hospital leaders to gain the support from hospitals, and hospital administrative means were adopted to gain the understanding and help of doctors. In the meantime, the uniformly trained investigators completed the questionnaire survey free from inductive questions, which maximised the authenticity of the data provided by doctors. After the questionnaires were recovered, logical errors were corrected, copies were reviewed, and missing items were filled in. In the end, the database for analysis was formed.

3.5.3 Data analysis quality control

In the process of statistical analysis, apart from studying literature, statistical experts were consulted to ensure that the adopted analytical methods and result explanations are correct.

3.6 Ethical considerations

Confidentiality

Participants' confidentiality was guaranteed. No personal information could be identified,

since questionnaire was coded without names on it. Online data of questionnaire was accessed only to the researcher. Results of the questionnaire were only used for the purpose of this study.

Autonomy

The aim of the study was explained clearly to the participant. They took part in the study voluntarily. A declaration was announced that there was no correlation between the information they disclosed with their performance appraisal. They could withdraw the study at any time during the survey.

Beneficence and Nonmalenificence

Items of the questionnaire were thought to be acceptable in the pilot study, and there were no potential harms to the participants. Results of this study will inform the problems existed in the hospital, and promote better human resource management strategies for the leaders of the hospital, hence the employees will benefit from the possible implementations in the future.

3.7 Data organisation and analysis

3.7.1 Data organization

After the questionnaires were recovered, Epidata 3.2 was used to enter data, verification documents were created to conduct logical review, and 2 per cent of the copies were selected for re-examination. Those with obvious mistakes or too many unanswered items were eliminated.

3.7.2 Factor analysis

Factor analysis is a method that uses dimensionality reduction to extract several unrelated and abstract comprehensive indicators from multiple measured variables. First, KMO statistics and Bartlett's sphericity test were used to verify whether the questionnaire is suitable for factor analysis. It is generally considered most effective when KMO statistics are greater than 0.9, moderately effective when they are greater than 0.7, not effective at 0.6 and unsuitable for factor analysis when less than 0.5. Bartlett's sphericity test mainly tests whether relevant matrixes are identity matrixes; that is, whether each variable is independent. If the variables are independent, then prudence is needed for factor analysis.

The present study used principal component analysis to extract initial factors. Varimax orthogonal rotation was conducted to better explain the actual significance of each factor.

3.7.3 Data description

Employee satisfaction, job engagement and human resource management perception among different demographic characteristics (gender, length of service, marital status, monthly income, position, professional title, age) were described to analyse the differences. The measurement data were described with mean ± standard deviation and comparison between groups was analysed with t test or variance. Enumeration data were described with percentage or composition ratio and comparison between groups was tested with χ^2.

3.7.4 Relevance analysis

Aimed to identify the factors influencing satisfaction, engagement and human resource management perception and analyse the relevance between employee satisfaction and engagement. The statistical methods adopted were Spearman's rank correlation analysis and Multiple Linear Regression. All the statistical analyses were completed with SPSS 20.0 analysis software. Two-sided test was used and the test level was α=0.05.

Chapter 4: Results

After adjusting the reliability and validity of HPWS, MSQ, UWES-9 and Gallup-12 scales by principal component analysis, I analysed the relationships between perception of HPWS human resource management and job satisfaction and engagement. The results are discussed below.

4.1 Description of the demographic Information of the participants

In total, 500 questionnaires were distributed, 495 of which were recovered, with a recovery rate of 99 per cent. The questionnaires with answers demonstrating strong consistency – those with over 10 per cent of missing questions in scale and those with more than two items of personal information missing – were removed. Finally, 455 valid questionnaires were recovered, with an effective rate of 91.92 per cent. Table 4-1 shows the general demographic characteristics of respondents in this survey.

Those 455 people were investigated and their general demographic characteristics are shown in Table 1. There are 363 female employees (79.78 per cent of the total), with an age of 33.60±7.66 years old (age range of 19–56).

A slight majority of employees (229, or 50.33 per cent) were aged 30–40, and the lowest number (22, or 4.84 per cent) were over 50 years of age. One hundred and thirty respondents (28.57 per cent) are unmarried.

Respondents with junior college education, four-year college education, and those with a master's degree or above account for 23.08 per cent, 63.30 per cent and 12.31 per cent of respondents, respectively.

Forty-nine respondents currently have no professional titles, 41.76 per cent have junior titles, 32.09 per cent have intermediate titles, 10.77 per cent have deputy senior titles and 4.62 per cent have senior titles.

Clinical doctors, nurses, medical technicians, administrative staff and logistics staff account for 14.95 per cent, 48.13 per cent, 27.47 per cent, 4.62 per cent and 4.84 per cent of respondents, respectively.

The average length of service is 11.38 ± 8.04 years, with the longest being 37 years and the

shortest (newcomer) being less than one year.

Nearly one-quarter (23.74 per cent) have a length of service shorter than five years and those with lengths of service of 6–10 years, 11–15 years, and above 15 years account for 34.07 per cent, 21.10 per cent and 21.10 per cent, respectively.

Respondents with an average monthly income of ¥5,000–¥8,000, ¥8,001–¥12,000 and above ¥12,000 account for 20.88 per cent, 42.64 per cent and 28.35 per cent of respondents, respectively.

Those not required to work night shifts represent 41.54 per cent of respondents, while 35.16 per cent are required to work night shifts once a week.

Table 4-1 The general demographic characteristics of respondents

	Characteristics	Number of people (N)	Composition ratio (%)
Sex	Male	92	20.22
	Female	363	79.78
Age (year)	Under 30	144	31.65
	30–40	229	50.33
	40–50	60	13.19
	Above 50	22	4.84
Marital status	Not married	130	28.57
	Married	325	71.43
Educational attainments	High school or lower	6	1.32
	College	105	23.08
	Bachelor	288	63.30
	Master	56	12.31
Title	None	49	10.77
	Junior	190	41.76
	Intermediate	146	32.09
	Deputy senior	49	10.77
	Senior	21	4.62
Position	Clinical doctor	68	14.95
	Nurse	219	48.13
	Medical technician	125	27.47
	Administrative Staff	21	4.62
	Logistics staff	22	4.84
Length of service	0–5 years	108	23.74
	6–10 years	155	34.07
	11–15 years	96	21.10
	Above 15 years	96	21.10
Monthly income (yuan)	Below 3000	18	3.96
	3000–5000	19	4.18
	5001–8000	95	20.88
	8001–12,000	194	42.64
	above 12,000	129	28.35
Number of weekly night	0	189	41.54
	1	160	35.16
	2	45	9.89
	3	16	3.52
	4	45	9.89

4.2 Perception of HPWS hospital human resource management

Before principal component analysis of HPWS scale, KMO measure and Bartlett test of entry were carried out. According to the test results, KMO value is 0.931 and Bartlett's spherical test $p<0.0001$, indicating that this data satisfies exploratory factor analysis conditions. Principal component analysis was used to extract three factors with characteristic values greater than 1, and the cumulative interpretation variance of three common factors was 56.53 per cent (greater than 50 per cent). According to Ford et al., the load on the factors must be greater than 0.40 and there can be no obvious principle of cross-factor loading. Table 4-2 shows item factor loads contained in the three factors of HPWS scale, and five items (Q1, Q14-Q17) that do not meet the above standards need to be eliminated.

Table 4-2 Rotation factor loading of HPWS scale

Item	common factor1	common factor2	common factor3
Q1	0.28	0.331	0.062
Q2	-0.102	0.722	0.192
Q3	0.214	0.615	0.316
Q4	0.346	0.742	0.157
Q5	0.354	0.717	0.125
Q6	0.387	0.728	0.118
Q7	0.27	0.497	0.223
Q8	0.563	0.065	0.178
Q9	0.524	0.339	0.374
Q10	0.748	0.25	0.147
Q11	0.792	0.302	0.14
Q12	0.709	0.276	0.262
Q13	0.627	0.248	0.271
Q14	0.593	0.267	0.442
Q15	0.537	0.183	0.591
Q16	0.564	0.236	0.547
Q17	0.519	0.272	0.506
Q18	0.24	0.229	0.555
Q19	0.031	0.087	0.746
Q20	0.263	0.269	0.665
Q21	0.264	0.131	0.721

The remaining items were explored again for factor analysis. The factor load of each objective factor was greater than 0.4, indicating that the scale had good structural validity.

The results show that the Cronbach's α analysis of the 16 reserved items is 0.901, indicating that the scale has good internal consistency.

In this case, although the resulting factors are orthogonal (no correlation), they are not easily named. In order to facilitate the interpretation of factors, the maximum variance orthogonal rotation method was adopted to make the factor loading divided into ±1. The name of each dimension is based on the entry with a large factor load on the common factor. Rotation

factor load matrix was as shown in Table 4-3, three common factors including 16 items can be divided into three groups, according to the scale items, will be three common factors: recruitment and selection (including Q2 to Q7), promotion and training (including Q8 ~ Q13), and performance appraisal and salary management (including Q18 ~ Q21).

Table 4-3 Rotation factor load matrix adjusted by HPWS scale

Item	recruitment and selection	promotion and training	performance appraisal and salary management
Q2	-0.107	0.73	0.173
Q3	0.236	0.618	0.303
Q4	0.338	0.758	0.118
Q5	0.372	0.715	0.109
Q6	0.387	0.729	0.098
Q7	0.27	0.511	0.189
Q8	0.611	0.023	0.226
Q9	0.542	0.354	0.348
Q10	0.755	0.253	0.138
Q11	0.798	0.304	0.129
Q12	0.728	0.275	0.263
Q13	0.638	0.256	0.261
Q18	0.29	0.21	0.594
Q19	0.057	0.096	0.765
Q20	0.291	0.258	0.693
Q21	0.276	0.145	0.724

Scores of dimensions of perception of HPWS hospital human resource management are shown in Table 4-4. The scores of recruitment and selection, promotion and training and performance appraisal and salary management are 34.01±5.26 points, 33.08±5.11 points and 20.82±4.11 points, respectively. The total score is 87.91±12.31 points.

Table 4-4 Scores of each dimension of HPWS hospital human resource management perception

Dimension	Score (points, mean ±standard deviation)
Recruitment and selection	34.01±5.26
Promotion and training	33.08±5.11
Performance appraisal and salary management	20.82±4.11
Total score	87.91±12.31

Table 4-5 shows the scores of each dimension of the perception of HPWS hospital human resource management by employees of different genders. Regarding the dimensions of

recruitment and selection (t=0.16, p=0.87) and promotion and training (t=1.57, p=0.12), there is no difference between male and female employees. Regarding the dimension of performance appraisal and salary management, male employees score 21.66±4.58 points, which is markedly higher than their female counterparts; the difference is statistically significant (t=2.20, p=0.04). Regarding the total score of the perception of human resource management at HPWS hospital, male employees score much higher than their female counterparts (89.71±15.78 points vs. 87.46±11.24 points; t=1.29, p=0.20).

Table 4-5 shows the scores of each dimensions of the perception of HPWS hospital human resource management by employees of different age groups. There is no statistically significant difference (p>0.05) in the scores of recruitment and selection, promotion and training, and performance appraisal and salary management, as well as the total score by employees of different age groups.

Table 4-5 shows scores of each dimension of HPWS hospital human resource management perception by employees of different types of marital status. The findings indicate that there is no statistically significant difference in the scores of recruitment and selection, promotion and training, performance appraisal and salary management and the total score by employees of different types of marital status (p>0.05).

Table 4-5 also shows the scores of each dimension of HPWS hospital human resource management perception by employees with different educational attainments. Regarding the dimension of recruitment and selection, employees with senior high school education or lower score the lowest, at 25.17±11.70 points, and those with a master's degree or above have the highest score of 35.25±6.51points. With the promotion of educational attainments, scores gradually increase by degrees (F=7.63, p<0.0001). Regarding the dimension of promotion and training, employees with senior high school education or lower score the lowest, at 25.67±12.91 points, while those with a master's degree or above have the highest score, with 34.79±4.93 points. With the promotion of educational attainments, scores gradually increase by degrees (F=6.63, p=0.0002). Regarding the dimension of performance appraisal and salary management, employees with senior high school education or lower score the lowest at 17.33±9.54 points, while those with a master's degree or above have the highest score, with 22.32±3.71 points. With the promotion of educational attainments, scores gradually increase by degrees (F=4.59, p=0.004). Regarding the total score of HPWS hospital human resource management perception, employees with senior high school education or lower score the lowest at 68.17±32.27 points, while those with a master's degree or above have the highest

score of 92.36±13.08 points. With the promotion of educational attainments, scores gradually increase by degrees (F=8.30, p<0.0001).

Table 4-5 also shows scores of dimensions of HPWS hospital human resource management perception by employees with different professional titles. There is no statistically significant difference (p>0.05) in the scores of recruitment and selection, promotion and training, performance appraisal and salary management and the total score by employees with different professional titles.

Table 4-5 Scores of each dimension of HPWS hospital human resource management perception by employees of different genders, age groups, marital status, educational background and professional titles

	Recruitment and selection	Promotion and training	Performance appraisal and salary management	Total score
Gender				
Male	34.11±6.87	33.93±6.08	21.66±4.58	89.71±15.78
Female	33.40±4.77	32.86±4.81	20.62±20.20	87.46±11.24
t	0.16	1.57	2.20	1.29
p	0.87	0.12	0.04	0.20
Age group				
Under 30	33.40±5.68	32.39±6.02	20.33±4.52	86.13±13.88
from 30 to 40	34.19±5.12	33.37±4.43	21.00±3.39	88.56±11.24
from 40 to 50	34.23±4.99	33.27±5.04	21.20±3.70	88.90±12.33
above 50	45.59±4.20	34.00±5.26	20.64±4.18	90.23±11.34
F	1.43	1.39	1.23	1.62
p	0.23	0.24	0.30	0.18
Marital status				
Unmarried	33.66±5.31	32.52±5.51	20.44±4.33	86.62±12.92
Married	34.16±5.24	33.30±4.93	20.98±4.02	88.43±12.03
t	0.90	1.48	1.27	1.43
p	0.37	0.14	0.21	0.15
Educational attainment				
High school	25.17±11.	25.67±12.	17.33±9.54	68.17±32.27
College	33.38±4.88	33.02±5.34	20.30±4.40	86.70±12.44
Bachelor	34.19±4.74	32.92±4.65	20.79±3.83	87.90±10.95
Master	35.25±6.51	34.79±4.93	22.32±3.71	92.36±13.08
F	7.63	6.63	4.59	8.30
p	<0.0001	0.0002	0.004	<0.0001
Professional title				
None	33.69±4.89	33.06±5.27	20.78±4.42	87.53±12.03
Primary	33.77±5.21	32.73±5.42	20.32±4.15	86.88±12.52
intermediate	33.72±5.74	32.93±4.94	20.04±4.22	87.69±62.74
Secondary	35.17±4.46	33.90±4.22	21.86±3.34	90.90±10.54
Senior	36.38±4.10	35.38±4.53	21.62±3.49	90.38±9.97
F	1.91	1.65	1.81	2.18
p	0.12	0.16	0.13	0.07

Table 4-6 shows the scores of each dimension of HPWS hospital human resource management perception by employees in different positions. Regarding the dimension of

recruitment and selection, there is no statistically significant difference in the scores of this dimension by employees at different positions (F=2.15, p=0.07). Regarding the dimension of promotion and training, nurses score the lowest at 32.37±5.51 points, while administrative staff have the highest score of 34.57±3.74 points. There is a statistically significant difference in scores of this dimension by employees at different positions (F=3.00, p=0.02). Regarding the dimension of performance appraisal and salary management, nurses score the lowest at 20.41±4.27 points, and clinical doctors have the highest score of 21.75±3.82 points. There is no statistically significant difference in scores of this dimension by employees at different positions (F=1.79, p=0.13). Regarding the total score of HPWS hospital human resource management perception, nurses score the lowest at 86.50±12.97 points, and clinical doctors have the highest score of 91.97±10.80 points. There is a statistically significant difference in the total score by employees at different positions (F=2.69, p=0.03).

Table 4-6 shows the scores of each dimension of HPWS hospital human resource management perception by employees with different lengths of service. There is no statistically significant difference in the scores of dimensions of recruitment and selection, promotion and training, and performance appraisal and salary management, and the total score by employees with different lengths of service (p>0.05).

Table 4-6 also shows the scores of each dimension of HPWS hospital human resource management perception by employees with different monthly incomes. Regarding the dimension of recruitment and selection, employees with a monthly income of ¥3000~¥5000 score the lowest at 31.21±8.21 points, while those with a monthly income of above ¥12,000 have the highest score of 34.93±4.67 points. There is a statistically significant difference in the scores of this dimension by employees with different monthly income (F=2.67, p=0.03). Regarding the dimension of promotion and training, employees with a monthly income of ¥3000~¥5000 score the lowest at 30.74±7.99 points and those with a monthly income of above ¥12,000 have the highest score of 34.34±4.17 points. There is a statistically significant difference in scores of this dimension by employees with different monthly incomes (F=3.81, p=0.005). Regarding the dimension of performance appraisal and salary management, employees with a monthly income of below ¥3000 score the lowest at 20.11±4.59 points and employees with a monthly income of above ¥12,000 have the highest score of 21.78±3.66 points. There is no statistically significant difference in scores of this dimension by employees with different monthly income (F=2.49, p=0.04). Regarding the total score of HPWS hospital human resource management perception, employees with a monthly income of ¥3000~¥5000

score the lowest at 82.68±19.28 points and those with a monthly income of above ¥12,000 have the highest score of 91.05±10.48 points. There is a statistically significant difference in the total score by employees with different monthly incomes (F=3.74, p=0.005).

Table 4-6 also shows the scores of each dimension of HPWS hospital human resource management perception by employees with different weekly night shifts. There is no statistically significant difference in scores of the dimensions of recruitment and selection, promotion and training and performance appraisal and salary management and the total score by employees with different weekly night shifts (p>0.05).

Table 4-6 Scores of each dimension of HPWS hospital human resource management perception by employees with different positions, lengths of service, monthly income, weekly night shifts

	Recruitment and selection	Promotion and training	Performance appraisal and salary management	Total score
Positions				
Clinical doctor	35.72±4.38	34.50±4.13	21.75±3.82	91.97±10.80
Nurse	33.73±5.47	32.37±5.51	20.41±4.27	86.50±12.97
Medical	33.77±4.77	33.36±4.42	20.81±3.82	87.94±10.93
Administrative	33.52±6.22	34.57±3.74	21.33±3.00	89.43±8.52
Logistics staff	33.45±6.57	32.73±7.19	21.73±5.37	87.91±18.04
F	2.15	3.00	1.79	2.69
p	0.07	0.02	0.13	0.03
Length of				
<5 years	33.71±5.39	32.82±5.57	20.47±4.31	87.01±13.18
6–10 years	33.47±5.59	32.43±5.04	20.65±4.09	86.54±12.14
11–15 years	34.72±4.55	33.77±4.63	21.01±4.17	89.50±11.07
Above 15 years	34.52±5.17	33.71±5.05	21.32±3.87	89.55±12.55
F	1.55	2	0.90	1.94
P	0.18	0.11	0.44	0.12
Monthly income				
Below 3000	32.83±5.19	31.67±5.49	20.11±4.59	86.61±12.01
3000–5000	31.21±8.21	30.74±7.99	20.74±4.60	82.68±19.28
5001–8000	33.97±5.18	33.04±5.41	20.44±4.58	87.45±12.75
8001–12,000	33.81±5.23	32.61±5.00	20.45±4.00	86.88±12.06
Above 12,000	34.93±4.67	34.34±4.17	21.78±3.66	91.05±10.48
F	2.67	3.81	2.49	3.74
p	0.03	0.005	0.04	0.005
Weekly night				
0	34.20±4.90	33.74±4.44	21.25±3.53	89.19±10.57
1	33.94±5.68	32.31±5.70	20.30±4.65	86.55±14.09
2	33.69±5.04	33.07±5.86	20.80±4.24	87.56±13.01
3	35.13±4.99	33.25±4.71	21.56±4.26	89.94±12.37
4	33.44±5.57	32.96±4.68	20.67±4.11	87.07±11.43
F	0.42	1.71	1.30	1.17
p	0.80	0.15	0.27	0.32

4.3 Hospital employees' job satisfaction

Before principal component analysis of MSQ scale, KMO measure and Bartlett sphere test of items were carried out. According to the test results, KMO value was 0.940 and Bartlett's test for globular shape $p< 0.0001$, indicating that the data met exploratory factor analysis conditions. Principal component analysis was used to extract three factors with characteristic values greater than 1, and the cumulative interpretation variance of three common factors was 64.33 per cent, which is greater than 50 per cent. According to Ford et al., the load on the factors must be greater than 0.40 and there can be no obvious principle of cross-factor loading. Table 4-7 shows item factor loads contained in three factors of MSQ scale, and six items (Q2–Q4, Q7–Q9) that do not meet the above standards need to be eliminated.

Table 4-7 Rotation factor loading of MSQ scale

Item	common factor1	common factor2	common factor3
Q1	0.487	0.385	-0.299
Q2	0.504	0.629	0.077
Q3	0.557	0.632	-0.003
Q4	0.604	0.518	0.043
Q5	0.781	-0.161	0.013
Q6	0.764	-0.202	0.008
Q7	0.497	-0.01	0.593
Q8	0.674	-0.07	0.477
Q9	0.701	0.14	0.521
Q10	0.724	0.258	0.39
Q11	0.779	0.221	0.291
Q12	0.744	0.044	-0.097
Q13	0.727	0.007	-0.269
Q14	0.751	-0.016	-0.23
Q15	0.828	0.032	0.011
Q16	0.781	0.094	0.058
Q17	0.802	-0.004	-0.162
Q18	0.641	-0.088	0.181
Q19	0.814	-0.083	-0.106
Q20	0.827	0.058	0.018

The remaining items were explored again for factor analysis, and a factor with a characteristic value greater than 1 was extracted using the principal component analysis method. The accumulated interpretation variance of single common factor was 56.85 per cent.

The factor load is shown in Table 4-8. Each factor load was greater than 0.4, indicating that the scale had good structural validity.

Table 4-8 Factor load after adjustment of MSQ scale

Item	Job satisfaction
Q1	0.51
Q5	0.761
Q6	0.739
Q10	0.752
Q11	0.806
Q12	0.751
Q13	0.722
Q14	0.743
Q15	0.828
Q16	0.794
Q17	0.804
Q18	0.641
Q19	0.807
Q20	0.834

For the Cronbach's α analysis of reserved 14 items, results show that the Cronbach's α is 0.94, indicating that the scale has good internal consistency.

The adjusted job satisfaction scale only contains one dimension, a total of 14 items, still named job satisfaction. According to the statistics, the job satisfaction score of the study subjects was 38.67 ± 10.26 points.

Table 4-9 shows the score of job satisfaction of employees with different gender, age, marital status, education level and professional title. Male employees' job satisfaction scores were 41.39±12.29, which is higher than that of female employees (37.99±9.58), with statistically significant differences (t=2.47, p=0.02). The score of job satisfaction of employees under 30 years old was the highest, 40.57±11.06, while that of 30–40-year-olds was the lowest at 37.47±9.84. The difference was statistically significant (t= 2.72, p= 0.05). The score of job satisfaction of unmarried employees was 40.20±11.48, which was higher than that of married employees 38.06±9.69. The difference was statistically significant (t= 2.01, p= 0.04). The highest score of job satisfaction was 43.17±8.93 for employees with high school education and

below, and the lowest score was 37.65±10.41 for those with a bachelor's degree, but the difference was not statistically significant (t= 3.67, p= 0.12). The score of job satisfaction was the lowest among the staff with an associate senior title, which was 35.53±9.00. The score of the staff with senior title was the highest, which was 44.76±8.83. The difference was statistically significant (F= 4.78, p< 0.001). The total score of job satisfaction decreased firstly and then increased with the promotion of job titles.

Table 4-9 Scores of each job satisfaction dimension of employees at different genders, age groups, marital status, educational background and professional titles

	Job Satisfaction	***t/F***	***p***
Gender		2.47	0.002
Male	41.39±12.29		
Female	37.99±9.58		
Age		2.72	0.05
Under 30	40.57±11.06		
30–40	37.47±9.84		
40–50	38.72±9.02		
Above 50	38.73±11.11		
Marital status		2.01	0.04
Single	40.20±11.48		
Married	38.06±9.69		
Education level		3.67	0.12
High school or lower	43.17±8.93		
College	39.38±9.94		
Bachelor	37.65±10.41		
Master	42.13±9.42		
Professional title		4.78	<0.001
None	41.94±10.68		
Primary	38.78±10.04		
Intermediate	37.62±10.48		
Secondary Senior	35.53±9.00		
Senior	44.76±8.83		

Table 4-10 shows the job satisfaction scores of employees in different positions, working years, monthly income and weekly night shift. The highest score was from management personnel, 46.05±9.84, while the lowest score was from medical staff: 37.28±9.70. The difference was statistically significant (t=4.85, p<0.001).

The lowest score of job satisfaction was from employees with 11–15 years of work

service, 37.05±9.95. The highest score was from employees with less than five years of service, 40.81±10.52. The difference was statistically significant (F= 2.78, p= 0.04). The score of job satisfaction decreases first and then increases with the extension of service age.

No statistically significant difference was found in the job satisfaction scores of employees with different monthly incomes (p>0.05). No statistical difference was found in the work satisfaction scores of employees with different numbers of night shift (p>0.05).

Table 4-10 Scores of each job satisfaction dimension of employees at different positions, lengths of service, monthly income, weekly night shifts

	Job Satisfaction	*t/F*	*p*
Positions		4.85	<0.001
Clinical doctor	38.99±10.42		
Nurse	38.17±10.10		
Medical technician	37.28±9.70		
Administrative Staff	46.05±9.84		
Logistics staff	43.59±11.43		
Length of service		2.78	0.04
<5 years	40.81±10.52		
6–10 years	37.87±10.57		
11–15 years	37.05±9.95		
Above 15 years	39.20±9.46		
Monthly income (¥)		0.49	0.75
Below 3000	38.83±11.39		
3000–5000	38.79±7.66		
5001–8000	37.93±9.95		
8001–12,000	38.35±10.28		
Above 12,000	39.68±10.70		
Weekly night shifts		0.45	0.78
0	39.34±10.00		
1	38.51±10.88		
2	38.00±10.36		
3	37.75±9.97		
4	37.47±9.28		

4.4 Job engagement of employees – Gallup Scale

Before principal component analysis of Gallup-Q12 scale, we carried out the KMO measure and Bartlett test of entry. According to the test results, KMO value is 0.907 and Bartlett's spherical test p< 0.0001, indicating that this data satisfies exploratory factor analysis conditions. Two factors with characteristic values greater than 1 were extracted by principal

component analysis, and the variance of the three common factors accumulatively explained was 60.12 per cent, which is greater than 50 per cent. According to Ford et al., the load on the factors must be greater than 0.40 and there can be no obvious principle of cross-factor loading. Table 4-11 shows the item factor load contained in the two factors of HPWS scale. Two items (Q8 and Q9) that do not meet the above standards need to be eliminated.

Table 4-11 Rotation Factor Loading of Gallup-Q12 Scale

Item	common factor1	common factor2
Q1	0.128	0.741
Q2	0.126	0.827
Q3	0.268	0.688
Q4	0.759	0.169
Q5	0.782	0.26
Q6	0.777	0.316
Q7	0.786	0.32
Q8	0.528	0.578
Q9	0.479	0.535
Q10	0.428	0.351
Q11	0.833	0.119
Q12	0.72	0.189

The remaining items were explored again for factor analysis. The factor load of each objective factor was greater than 0.4, indicating that the scale had good structural validity.

The Cronbach's α of the 16 reserved items is 0.886, indicating that the scale has good internal consistency.

In this case, although the resulting factors are orthogonal (no correlation), they are not easily named. In order to facilitate the interpretation of factors, the maximum variance orthogonal rotation method was adopted to make the factor loading divided into±1. The dimensions are named according to the items on the common factor that have a large factor load. The factor loading after rotation with the maximum variance is shown in Table 4-11. The two common factors extracted can divide 10 items into two categories. According to the content of the scale, the two common factors are basic work requirements (Q1–Q3), management support and common development (Q4–Q7, Q10–Q12).

Table 4-12 Rotation factor load matrix adjusted by Gallup-Q12 scale

Item	Basic work requirements	Management support and common development
Q1	0.163	0.747
Q2	0.164	0.851
Q3	0.299	0.723
Q4	0.765	0.181
Q5	0.793	0.245
Q6	0.792	0.308
Q7	0.797	0.282
Q10	0.454	0.278
Q11	0.838	0.086
Q12	0.733	0.161

The basic work requirements, management support and common development of hospital staff were 10.55±2.47 and 21.25±7.95, respectively, and the total score is 31.81±9.46.

The scores of work engagement-Gallup dimensions of different genders are shown in Table 4-12. There was no significant difference (t=1.47, p=0.14) between male employees (10.89±2.46) and female employees (10.47±2.47). In the dimension of management support and co-development, male employees scored 21.53±7.94 and female employees scored 21.18±7.96, with no significant difference (t=0.37, p=0.71). The total score of work engagement-Gallup was 32.42±9.44 for male employees and 31.65±9.47 for female employees, with no statistical difference (t= 0.70, p= 0.49).

Table 4-13 shows the scores of work engagement-Gallup dimensions of employees at different ages. In the dimension of job basic demand, 30–40-year-old employees scored the lowest, 10.34±2.43, and those under 30 years old scored the highest (10.89±2.54), but the difference was not significant (F=1.51, p=0.21). In the dimension of management support and common development, employees over 50 years old scored the lowest (16.55±8.34) and those under 30 years old scored the highest (22.20±7.75); in this case the difference was statistically significant (F=3.34, p=0.02). The total score of work engagement-Gallup was the lowest among employees over 50 years old, which was 27.00±10.43. The highest score was 31.53±9.30 among employees aged 30–40 years old and the difference was statistically

significant (F=2.89, p=0.04).

The scores of work engagement-Gallup dimensions in different marital status are shown in Table 4-12. The score of unmarried employees was 10.96±2.35, which was higher than that of married employees (10.39±2.50), and the difference was statistically significant (*t*=2.24, *p*=0.03). In the dimension of management support and co-development, the score of unmarried employees was 21.81±7.75, which was higher than that of married employees (21.03±8.03), but there was no statistically significant difference (*t*=0.94, *p*=0.35). The total score of work engagement-Gallup of unmarried employees was 32.77±9.19, which was significantly higher than that of married employees 31.42±9.55, but again the difference was not statistically significant (t=1.37, p=0.17).

Table 4-13 also shows the scores of work engagement-Gallup dimensions of different educational levels. In the dimension of job basic demand, the score of undergraduate staff was the lowest at 10.30±2.61, while that of high school and below was the highest, which was 11.17±1.17; the difference was statistically significant (F=2.85, p=0.04). There was no significant difference in management support, co-development dimension and total job engagement-Gallup among employees with different educational levels (p>0.05).

The scores of job engagement-Gallup dimensions of employees with different titles are also shown in Table 4-13. There was no significant difference (p>0.05) in the scores of basic work needs, management support, common development and total work engagement-Gallup among employees with different professional titles.

Table 4-13 Scores of each job engagement-Gallup dimension of employees at different genders, age groups, marital status, educational background and professional titles

	Basic job requirement	Support from management and joint development	Total Score
Gender			
Male	10.89±2.46	21.53±7.94	32.42±9.44
Female	10.47±2.47	21.18±7.96	31.65±9.47
t	1.47	0.37	0.70
p	0.14	0.71	0.49
Age			
under 30	10.89±2.54	22.20±7.75	33.09±3.93
30–40	10.34±2.43	21.20±7.87	31.53±9.30
40–50	10.62±2.21	20.93±8.15	31.55±9.41
Above 50	10.45±2.96	16.55±8.34	27.00±10.43
F	1.51	3.34	2.89
P	0.21	0.02	0.04
Marital status			
Single	10.96±2.35	21.81±7.75	32.77±9.19
Married	10.39±2.50	21.03±8.03	31.42±9.55
t	2.24	0.94	1.37
p	0.03	0.35	0.17
Educational level			
High school or lower	11.17±1.17	21.17±6.82	32.33±7.53
College	10.96±2.01	21.34±7.97	32.30±8.96
Bachelor	10.30±2.61	21.13±7.99	31.42±9.67
Master	11.04±2.47	21.77±8.00	32.80±9.46
F	2.85	0.11	0.47
p	0.04	0.96	0.71
Professional title			
None	11.20±1.97	21.55±7.88	32.76±9.10
Primary	10.59±2.64	21.93±7.477	32.52±9.05
Intermediate	10.38±2.37	20.94±8.59	31.32±10.02
Secondary senior	10.16±2.22	19.37±7.51	29.53±8.87
Senior	10.81±2.98	21.10±8.69	31.90±10.99
F	1.42	1.11	1.20
p	0.23	0.35	0.31

Table 4-14 shows the scores of each dimension of job engagement-Gallup by employees at different positions. Regarding basic job requirements, clinical doctors score the lowest at 10.40±2.80 points, while administrative staff have the highest score, with 11.81±2.02 points.

There is a statistically significant difference (F=2.61, p=0.04). Regarding support from management and co-development, clinical doctors score the lowest at 19.63±8.96 points, while administrative staff have the highest score, with 25.81±8.12 points. There is statistically significant difference (F=3.13, p=0.01). Regarding the total score of job engagement-Gallup, clinical doctors score the lowest at 30.03±10.72 points, and administrative staff have the highest score of 37.62±9.53 points; the difference is statistically significant (F=2.99, p=0.02).

Table 4-14 also shows the scores of each dimension of job engagement-Gallup by employees with different lengths of service. There is no statistically significant difference regarding the scores of the dimension of basic job requirements, the dimension of support from management as well as the total score of job engagement-Gallup (p>0.05).

The same table shows the scores of each dimension of job engagement-Gallup by employees with different monthly income. There is no statistically significant difference regarding the scores of the dimension of basic job requirements, the dimension of support from management or the total score of job engagement-Gallup (p>0.05).

Table 4-14 also shows the scores of each dimension of job engagement-Gallup by employees with different weekly night shifts. There is no statistically significant difference regarding the scores of the dimension of basic job requirements, the dimension of support from management or the total score of job engagement-Gallup (p>0.05).

4.5 Job engagement of employees-UWES

Before conducting the principal component analysis of UWES-9 scale, we carried out the KMO measure and Bartlett test of the entry. According to the test results, the KMO value is 0.913 and Bartlett's test $p < 0.0001$, indicating that this data satisfies exploratory factor analysis conditions. Factors with a characteristic value greater than 1 were extracted using the principal component analysis method, and the accumulated interpretation variance of a single common factor was 77.47 per cent; that is, greater than 50 per cent. According to Ford et al., the load on the factors must be greater than 0.40 and there can be no obvious principle of cross-factor loading. Table 4-15 shows the item factor load contained in a single factor of UWES-9 scale. Two items that do not meet the above standards (Q7 and Q8) had to be eliminated.

Table 4-14 Scores of each job satisfaction engagement-Gallup of employees at different positions, lengths of service, monthly income, weekly night shifts

	Basic job requirements	Support from management	Total score
Position			
Clinical doctor	10.40±2.80	19.63±8.96	30.03±10.72
Nurse	10.45±2.45	21.83±7.43	32.28±8.97
Medical technician	10.42±2.42	20.60±7.78	31.02±9.22
Administrative Staff	11.81±2.02	25.81±8.12	37.62±9.53
Logistics staff	11.59±1.76	19.95±8.93	31.55±9.63
F	2.61	3.13	2.99
p	0.04	0.01	0.02
Length of service			
Under 5 years	10.68±2.78	21.06±8.47	31.73±10.26
6–10 years	10.42±2.54	21.60±7.93	32.02±9.53
11–15 years	10.47±2.30	21.32±7.47	31.79±8.886
Above 15 years	10.72±2.16	20.85±7.95	31.57±9.11
F	0.42	0.20	0.05
p	0.77	0.89	0.99
Monthly income (¥)			
Below 3000	10.44±3.07	18.56±7.56	29.00±8.65
3000–5000	10.89±2.64	22.63±6.778	33.53±8.89
5001–8000	10.91±2.32	20.87±8.68	31.78±10.04
8001–12,000	10.38±2.56	21.41±7.79	31.80±9.40
Above 12,000	10.52±2.34	21.47±7.86	31.99±9.36
F	0.82	0.76	0.56
p	0.51	0.55	0.69
Weekly night shifts			
0	10.67±2.44	20.72±8.45	31.39±9.98
1	10.44±2.57	21.83±7.35	32.26±8.95
2	10.38±2.60	21.29±8.06	31.67±9.86
3	10.75±2.44	22.69±7.52	33.44±9.31
4	10.60±2.20	20.93±8.04	31.53±8.90
F	0.27	0.57	0.32
p	0.90	0.69	0.87

Table 4-15 UWES-9 Scale Rotation Factor Loading

Item	Job engagement-UWES
Q1	0.829
Q2	0.913
Q3	0.856
Q4	0.903
Q5	0.911
Q6	0.858
Q7	0.496
Q8	0.493
Q9	0.873

The remaining items were explored again for factor analysis and the factor load is detailed in Table 4-16. The factor load of each objective factor was greater than 0.4, indicating that the scale has good structural validity.

Table 4-16 Factor loading after adjustment of UWES-9 scale

Item	Job engagement-UWES
Q1	0.813
Q2	0.907
Q3	0.851
Q4	0.909
Q5	0.918
Q6	0.867
Q7	0.89
Q8	0.813
Q9	0.907

The Cronbach's α of the seven reserved items was 0.95, indicating that the scale has good internal consistency.

The adjusted job engagement-UWES scale included only one dimension, with a total of seven items, still named job satisfaction. The study subjects' job satisfaction score was 28.38±11.59.

Table 4-17 shows the scores of different gender, age, marital status, educational level and job engagement-UWES of the staff with different titles. There were no significant differences in job engagement-UWES scores among different genders (p>0.05). The score of job engagement-UWES of employees of different ages was the lowest among 30–40-year-old employees, which was 27.66±11.92. The score of employees over 50 years old was the highest,

at 34.23±8.88, but there was no significant difference (F=2.20, p=0.09). There was no significant differences in job engagement-UWES scores among different marital status (p>0.05). Employees with different educational levels scored the lowest in job engagement-UWES, with a score of 26.50±15.03 for those with high school education or below, and 32.68±9.85 for those with master's degree or above. The difference was statistically significant (F=4.09, p=0.007). The score of job engagement-UWES of employees with different professional titles was the lowest, at 27.22±11.83 for those with primary professional titles and 36.00±7.54 for those with senior professional titles. The difference was statistically significant (F=3.40, p=0.01). With the increase of job title, the total score of work engagement-UWES decreased first and then increased.

Table 4-17 Scores of each job engagement-UWES dimension of employees at different genders, age groups, marital status, educational background and professional titles

	Total score	*t/F*	*p*
Gender		1.58	0.11
Male	30.09±11.23		
Female	27.95±11.65		
Age group		2.20	0.09
Under 30	28.53±11.60		
30–40	27.66±11.92		
40–50	28.67±10.77		
Above 50	34.23±8.88		
Marital status			
Unmarried	28.36±11.84	0.03	0.98
Married	28.39±11.51		
Educational attainments		4.09	0.007
High school	26.50±15.03		
College	29.53±11.27		
Bachelor	27.17±11.76		
Master	32.68±9.85		
Professional titles		3.40	0.01
None	30.59±10.59		
Primary	27.22±11.83		
Intermediate	27.82±11.95		
Secondary	29.12±10.71		
Senior	36.00±7.54		

Table 4-18 shows the scores regarding job engagement-UWES of employees with different positions, length of service, monthly income and number of night shifts per week. The score of job engagement-UWES was the lowest for nurses with professional titles (26.90±11.81) and the highest for managers (34.43±10.01). The difference was statistically significant (F=3.08, p=0.02). The score of work engagement-UWES was the lowest for

workers with 6–10 years of service (26.17±12.64) while the highest score was 30.64±10.47 for workers with over 15 years of service (F=3.84, p=0.01). The score of job engagement-UWES was the lowest among employees whose monthly income ranged from 8001–12,000 yuan (26.96±12.07), and the highest among employees whose monthly income was more than 12,000 yuan (31.47±10.41). The difference was statistically significant (F=3.43, p=0.01). There was no significant difference in job engagement-UWES scores between different night shifts (p>0.05).

Table 4-18 Scores of each job engagement-UWES of employees at different positions, lengths of service, monthly income, weekly night shifts

	Total score	t/F	p
Position		3.08	0.02
Clinical doctor	30.25±10.77		
Nurse	26.90±11.81		
Medical technician	28.52±11.69		
Administrative Staff	34.43±10.01		
Logistics staff	30.86±10.33		
Length of service		3.84	0.01
Under 5 years	29.93±10.31		
6–10 years	26.17±12.64		
11–15 years	27.98±11.74		
Above 15 years	30.64±10.47		
Monthly income (¥)		3.43	0.01
Below 3000	29.00±10.28		
3000–5000	28.05±11.42		
5001–8000	27.04±11.79		
8001–12,000	26.96±12.07		
Above 12,000	31.47±10.41		
Weekly night shifts			
0	30.06±10.75	2.30	0.06
1	27.37±12.05		
2	25.47±12.77		
3	30.50±10.13		
4	27.13±11.93		

4.6 Analysis of the correlation between human resource management perception, job satisfaction and job engagement

4.6.1 Correlation between human resource management perception and job satisfaction

The correlation analysis of human resource management cognition dimensions and job

satisfaction is shown in Table 4-19. The dimensions and total scores of human resource management cognition were positively correlated with the dimensions and total scores of job satisfaction ($p< 0.0001$), and the correlation coefficient was 0.26–0.42.

Table 4-19 Analysis of the correlation between employees' human resource management perceptions and each dimension of job satisfaction (*r*)

Item	job satisfaction	
	r	*p*
Recruitment and selection	0.26	<.0.0001
Promotion and training	0.42	<.0.0001
Performance appraisal and salary management	0.35	<.0.0001
Total score	0.40	<.0.0001

4.6.2 Correlation between human resource management perception and job engagement-Gallup

The correlation analysis of human resource management cognition and job engagement-Gallup dimensions is shown in Table 4-20. There was a significant positive correlation between each dimension and total score of human resource management cognition and each dimension and total score of job engagement-Gallup ($p<0.0001$), and the correlation coefficient was 0.15–0.37.

Table 4-20 Analysis of the correlation between employees' human resource management perception and each dimension of job engagement-Gallup (*r*)

Item	Basic job requirements		Support from management		Total score	
	r	*p*	*r*	*p*	*r*	*p*
Recruitment and selection	0.15	<.0.0001	0.19	<.0.0001	0.19	<.0.0001
Promotion and training	0.32	<.0.0001	0.34	<.0.0001	0.37	<.0.0001
Performance appraisal and salary management	0.30	<.0.0001	0.30	<.0.0001	0.33	<.0.0001
Total score	0.30	<.0.0001	0.32	<.0.0001	0.34	<.0.0001

4.6.3 Correlation between human resource management perception and job engagement-UWES

The correlation analysis between the cognition of human resource management and the dimensions of work engagement-UWES is shown in Table 4-21. There was a significant positive correlation between each dimension and total score of human resource management cognition and each dimension and total score of job engagement-UWES (p<0.0001), and the correlation coefficient was 0.27–0.40.

Table 4-21 Analysis of the correlation between employees' human resource management perception and each dimension of job engagement-UWES (r)

Item	job engagement-UWES	
	r	*p*
Recruitment and selection	0.27	<.0.0001
Promotion and training	0.40	<.0.0001
Performance appraisal and salary management	0.31	<.0.0001
Total score	0.38	<.0.0001

4.6.4 Correlation between each dimension of job satisfaction and each dimension of job engagement-Gallup

The correlation between job satisfaction dimensions and job engagement-Gallup dimensions is shown in Table 4-22. All dimensions and total scores of job satisfaction were positively correlated with each dimension and total score of job engagement-Gallup (p<0.0001), and the correlation coefficient was 0.58–0.64.

Table 4-22 Correlation between each dimension of job satisfaction and each dimension of job engagement-Gallup (r)

Item	job satisfaction-Gallup	
	r	*p*
Basic job requirements	0.58	<.0.0001
Support from management	0.59	<.0.0001
Total score	0.64	<.0.0001

4.6.5 Correlation between each dimension of job satisfaction and each dimension of job engagement-UWES

The correlation analysis between job satisfaction and job engagement-UWES showed that job satisfaction score was positively correlated with job engagement-UWES score (r=0.52, p<0.0001).

4.6.6 Correlation between each dimension of job engagement-Gallup and each dimension of job engagement-UWES

The correlation between job engagement-Gallup dimensions and job engagement-UWES dimensions is shown in Table 4-23. The dimensions and total scores of work engagement-Gallup were positively correlated with the dimensions and total scores of work engagement-UWES (p<0.0001), and the correlation coefficient was 0.33–0.44.

Table 4-23 Correlation between each dimension of job engagement-Gallup and each dimension of job engagement-UWES (r)

Item	job engagement-UWES	
	r	*p*
Basic job requirements	0.33	<.0.0001
Support from management	0.42	<.0.0001
Total score	0.44	<.0.0001

4.7 Multi-factor regression analysis of the influence of each dimension of human resource management perception on job satisfaction and engagement

Taking the cognitive dimensions of human resource management as independent variables and the total scores/dimensions of satisfaction and engagement as dependent variables, the effects of general demographic characteristics (gender, length of service, marital status, monthly income, position, title, age, number of night shifts per week, educational level) were adjusted by multivariate linear regression analysis to explore the correlation between the cognition of human resource management and job satisfaction and engagement.

4.7.1 Multi-factor regression analysis of the influence of human resource management perception on job satisfaction

Table 4-24 shows the multiple linear regression results of job satisfaction with the cognition of human resource management. After adjusting the effects of demographic characteristics (gender, length of service, marital status, monthly income, position, title, age, number of night shifts per week, educational level), there was no significant correlation between recruitment and selection on job satisfaction (p>0.05). Promotion and training had a higher correlation with the total score of job satisfaction (β= 0.67, p<0.0001), followed by performance appraisal and salary management (β= 0.41, p=0.004).

Table 4-24 Multi-factor regression analysis of the influence of human resource management perception on job satisfaction

Dependent variables	Independent variables	β	t	p	R^2	Adjusted R^2
Intrinsic satisfaction	Recruitment and selection	-0.05	0.49	0.63	0.23	0.21
	Promotion and training	0.67	5.67	<0.0001		
	Performance appraisal and salary management	0.41	3.09	0.004		

4.7.2 Multi-factor regression analysis of the influence of human resource management perception on job engagement-Gallup

Table 4-25 shows the multiple linear regression results of human resource management cognition on job engagement-Gallup. After adjusting for the influence of demographic characteristics (gender, length of service, marital status, monthly income, position, title, age, number of night shifts per week, educational level), there was no significant correlation between recruitment and selection on the basic job needs, management support and common development dimensions and the total score of job engagement-Gallup (p>0.05).

The correlation between promotion and training on management support and co-development dimension (β=0.45, p=0.007) was higher than that of the job basic needs dimension (β=0.14, p< 0.0001). The total score of job engagement-Gallup is high (β=0.60, p<0.0001).

The correlation between performance appraisal and salary management on management support and common development dimension was highest (β=0.34, p=0.0001), followed by the correlation with job basic needs dimension (β=0.12, p=0.0003). The total score of job

engagement-Gallup is high (β=0.46, p=0.0002).

Table 4-25 Multi-factor regression analysis of the influence of human resource management perception on job engagement-Gallup

Dependent variables	Independent variables	β	t	p	R^2	Adjusted R^2
Basic job requirement	Recruitment and selection	-0.06	2.21	0.03	0.18	0.16
	Promotion and training	0.14	4.89	<0.0001		
	Performance appraisal and salary management	0.12	3.65	0.0003		
Support from management and joint development	Recruitment and selection	-0.12	1.41	0.16	0.18	0.16
	Promotion and training	0.45	4.78	<0.0001		
	Performance appraisal and salary management	0.34	3.21	0.0001		
Job engagement-Gallup	Recruitment and selection	-0.18	1.79	0.07	0.21	0.19
	Promotion and training	0.60	5.39	<0.0001		
	Performance appraisal and salary management	0.46	3.72	0.0002		

4.7.3 Multi-factor regression analysis of the influence of human resource management perception on job engagement-UWES

Table 4-26 shows the multiple linear regression results of human resource management cognition to work engagement-UWES. After adjusting for the influence of demographic characteristics (gender, length of service, marital status, monthly income, position, title, age, number of night shifts per week, educational level), there was no significant correlation between recruitment and job engagement-UWES p>0.05). Promotion and training were highly correlated with job engagement-UWES scores (β=0.71, p<0.0001). The correlation between performance appraisal and salary management is second behind the total score of work

engagement-UWES (β=0.32, p=0.04).

Table 4-26 Multi-factor regression analysis of the influence of human resource management perception on job engagement-UWES

Dependent variables	Independent variables	β	t	p	R^2	Adjusted R^2
Job engagement-UWES	Recruitment and selection	0.03	0.22	0.83	0.18	0.16
	Promotion and training	0.71	5.13	<0.0001		
	Performance appraisal and salary management	0.32	2.09	0.04		

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Chapter 5: Research Findings and Discussions

5.1 Research findings

Hospitals with high organization performance tend to regard human resources as a key strategic component of its management. This implies that hospital management requires the participation of professional managers. Through management practices, such as valuing communication and interaction with employees, ensuring job safety and providing timely performance assessment, management would empower employees to become owners of the hospital, so they would be willing to contribute to the hospital's continuous development and improvement. At the same time, future research should also take into consideration different development backgrounds of the health-care industry in various countries. Certain HPWS that fit in other countries might not work in China. When Chinese scholars conduct relevant research, they could revise some of the metrics according to the domestic environment. This research has also verified the suitability of applying HPWS in the health-care industry. The system is not only effective for employees in the manufacturing, financial service and corporate franchise industries, but is also effective in predicting the performance of health-care professionals. The HPWS emphasizes a series of human-resource management practices, such as: Providing necessary training to employees; paying close attention to employee job security and safety; encouraging employees to be more autonomous; and providing transparent, fair performance assessments and work-delegation systems. When the organization shows concern and care for its staff, employees would be more willing to dedicate themselves to their work and increase their satisfaction toward their job, working environment, and relationships.

Specifically, the research has the findings as below.

5.1.1 Demographic characteristics have impacts on job satisfaction

After correcting and adjusting the MSQ scale, we evaluated the job satisfaction of the respondents. The total scores of job satisfaction of the respondents are 38.67±10.26 points at the intermediate level. There are differences in the job satisfaction of medical workers of different genders, ages, types of marital status, educational attainments, professional titles, positions and lengths of service.

Relevant studies carried out among medical workers in Tibet showed no difference in job satisfaction between respondents of different genders (Zha et al., 2017). Other studies indicated that the job satisfaction scores of females are higher than those of males; researchers have suggested that this could be because men focus more on career development, devote more energy to work and have higher requirements for organisational environment management than women, which result in their relatively low satisfaction (Hu et al., 2013; Jinjiang et al., 2018). However, the results of the present study contrast to those of earlier studies by showing that the job satisfaction scores of males are higher than those of females. As male medical workers account for only 20.22 per cent in this study, the research results might not be so representative. Instead, the sample size needs to be enlarged to further explore the influences of gender on satisfaction.

Mei et al. (2017) conducted a cross-sectional study of the job satisfaction of medical workers after the new medical reform was carried out. The results showed a correlation between the length of service and job satisfaction. To be specific, with the increase in the length of service, the satisfaction of medical workers exhibited a trend from decrease to increase, which is consistent with the results of this study. With the increase in working hours, the feeling of freshness brought by work gradually gets replaced by repetitive content and the dissatisfaction with job returns and work environment gradually accumulates. Also, due to the influence of family, life, continuous study and other aspects, job satisfaction also decreases. However, with the increased length of service, the work experience of medical workers also continuously accumulates. The degree of recognition and sense of achievement brought by work also increases accordingly, salary increases significantly and the attitude towards job competition gradually disappears. As a result, a turning point appears where job satisfaction gradually increases. This is in line with the results of multiple extant studies (Hu et al., 2013; Xuefeng & Yongjin, 2014; Yang & Li, 2016; Mei et al., 2017; Zha et al., 2017; Jinjiang et al., 2018). Nevertheless, some studies have shown that the job satisfaction of medical personnel gradually decreases with an increase in age without a turning point for increase (Yu et al., 2018).

There is strong co-linearity between professional title and length of service. The results of this study also suggest that the scores of job satisfaction exhibit a trend of decrease before increase. The satisfaction of employees with relatively low professional titles is relatively high, mainly because this group of people undertake a relatively small workload, have relatively light job tasks and suffer from relatively low work stress. This is also related to the disproportional increase in the salaries of their counterparts with a long length of service, high educational

background and high professional titles, as well as employees in clinical departments. This is consistent with the investigation results of other studies (Yang & Li, 2016; Chen et al., 2017; Jinjiang et al., 2018). However, Hu et al. (2013) found no difference in satisfaction between different educational attainment, professional titles and positions using organisational environment management satisfaction as the research content (Hu et al., 2013). Relevant studies carried out among medical personnel in Tibet found that there are differences in the job satisfaction between different professional titles (Zha et al., 2017), which might be attributable to the differences in the professional title composition in different studies. Further research is needed.

The results of the present study suggest that the total scores of job satisfaction of unmarried respondents are significantly higher than those of their married counterparts. Married medical workers undertake more social roles and have lower satisfaction due to the multiple influences form family, society and work (Hu et al., 2013). Yao et al. (2018) analysed the job satisfaction of medical workers of different types of marital status in detail. The results showed that the job satisfaction of unmarried people is higher than that of married ones and the job satisfaction of married ones is higher than that of divorced ones (Jinjiang et al., 2018). However, other studies have pointed out that, among single individuals, divorced and widowed people face more social stress and lack social support and therefore have lower satisfaction (Zha et al., 2017). The inconsistency in the research results is mainly attributable to the inconsistency in the composition of unmarried people. In subsequent studies, the types of marital status can be further divided into married, unmarried, divorced and widowed, based on the enlarged sample size, so as to further explore the influences of different types of marital status on job satisfaction.

The results of this study indicate that the total scores of the satisfaction of employees with high school diplomas or below are the highest, followed by employees with master's degrees or above, with those of employees with bachelor's degrees being the lowest. However, no statistically significant differences have been found. This is consistent with the results of Hu et al.'s (2013) studies on organisational environment management satisfaction. Nevertheless, the results of other studies have found statistically significant differences (Chen et al, 2017; Yang & Li, 2016; Yao et al., 2018). This could be explained by the low level of competitiveness among employees with high school diplomas, which for them to get a job in hospitals. Also, due to their limited professional abilities, they undertake relatively easy tasks, which results in their relatively high job satisfaction. Employees with master's degrees or above, with strong

professional abilities, take important positions in hospitals and enjoy a certain level of status. Their compensation package also improves accordingly. However, employees with bachelor's degrees lie between the former two groups of people. As the main executers of daily work, they have a relatively heavy workload; dealing with daily affairs will consume a lot of their energy, and their speed of promotion and compensation package are not proportional to their job content, etc. All these factors will cause the total scores, and the scores of each dimension, of the job satisfaction of employees to remain at the lowest level. However, the studies carried out among medical workers in Tibet suggest that the job satisfaction of those who have not attended colleges is higher than that of those with college degrees or above (Zha et al., 2017). This could be because very few people in Tibet have master's degrees or above and college degrees or above are already considered high-level qualifications.

The present study has explored the job satisfaction of doctors, nurses, medical technicians, administrative and management staff and logistic staff in detail. The results indicate that the scores of job satisfaction of administrative and management staff all remain at a relatively high level, followed by logistical staff. Doctors remain at the medium level, followed by nurses, with the job satisfaction of medical technicians being the lowest. Administrative and management staff, who are responsible for hospital management affairs, do not directly contact patients; besides, they participate in the formulation of various rules and regulations of the hospital internal operation, which enables them to better understand the meaning of formulating different regulations. In comparison, doctors face more work stress, work risks and job tension. While nurses also face high intensity, high tension and high risks, they lag behind doctors in terms of compensation package, job achievement and sense of respect, which could lead to their relatively low job satisfaction. However, other studies have suggested that the job satisfaction of nurses is higher than that of doctors (Shilong, Pengqian, & Shan, 2013; Yang & Li, 2016; Jinjiang et al., 2018). Further research is necessary.

Some studies have suggested that job satisfaction will increase as monthly salary increases (Yu et al., 2018). However, the present study did not find statistically significant differences in the total scores of job satisfaction between employees with different monthly incomes.

5.1.2 Demographic characteristics have impacts on work engagement

(1) Factors influencing job engagement-Gallup

This study used the adjusted Gallup Q12 scale to evaluate the job engagement-Gallup of

hospital employees, with the total score being 31.81±9.46 points at the intermediate level. The results of this study suggest that the general demographic characteristics that affect the job engagement-Gallup of hospital employees include age, marital status, position, etc.

We found no difference in the job engagement-Gallup between medical workers of different genders, which is consistent with the results of some earlier studies (Li, 2011; Zhu et al., 2015). However, some other studies hold that women tend to put more energy into taking care of their family, which means their engagement is more likely to be increased by family factors (Rothbard, 2001). Therefore, the job engagement of women is generally lower than that of men, and the same phenomenon applies among medical workers (Schaufeli, Martínez, Marques Pinto, Salanova, & Bakker, 2002; Zhou, 2013; Pang, 2014). Xu et al. (2016) conducted a study among emergency room (ER) nurses, finding that the job engagement of female nurses is higher than that of male nurses. This could be because male nurses deem that the nursing profession has low technical content, a low professional status and low social recognition, which further lead to low work vitality and low job engagement (Xudong et al., 2016). Currently, most nurses are female. Some male nurses believe that their job cannot enable them to realise self-value and, as a result, they suffer from a low sense of professional achievement and have low professional attitudes (Hao & Yan, 2013), 2013). This is related to the difference in the professional attitudes and professional recognition of different genders.

The work and family stresses faced by medical workers of different age groups are different, which will inevitably have different influences on their job engagement ((Huang, 2017). Zhou et al.'s (2013) study of medical workers in private hospitals found that the job engagement of employees older than 50 is significantly higher than those at or below 30, which is consistent with other research results (Pang, 2014; Huang, 2017). However, the results of the present study also indicate that the scores of each dimension and the total scores of the job engagement-Gallup of respondents above 50 are relatively low, whereas those of the respondents below 30 are the highest. There are only 22 respondents above 50 in this study, accounting for 4.84 per cent, which might not be representative enough. Thus, the influences of age on job engagement need to be further explored on the basis of an enlarged sample size.

This study found no difference in the job engagement-Gallup of medical workers with different lengths of service. However, Xu et al. (2016) found that, with the increase in the length of service in emergency treatment, ER nurses gradually experience an increase in job engagement. This may be because, with the increase in the length of service, the match between individuals' values and the organisational values gradually increases as individuals get edified

by the organisational culture (Yang, 2010). Besides, while their work experience gradually accumulates, and they have better work proficiency, they gradually enjoy higher positions and salaries. Thus, the sense of achievement and recognition coming from work gradually increases, which is reflected as increased job engagement and sense of responsibility (Xudong et al., 2016). Pang et al. (2014) also found that job engagement increases as the length of service increases, with six years as a threshold. Specifically, the job engagement of employees who have worked for over six years exhibits no statistically significant difference and is significantly higher than that of employees who have worked for fewer than six years (Pang, 2014). This is in line with the results of other studies (Cha, 2007). However, Zhou et al. (2013) found, in a study of medical personnel in private hospitals, that the job engagement of employees who have worked for five years or below is the highest and that job engagement decreases with as the length of service increases. As knowledge-based people, medical workers have received professional education and have clear career objectives. The 3A hospitals have provided them with a strong development platform. Therefore, with the increase in the length of service, their identification with the sense of belonging towards the hospitals will also increase. By comparison, private hospitals may have some deficiencies in development, which may result in decreased job engagement with the increase in the length of service.

This study found no difference in the job engagement-Gallup of medical workers with different professional titles either. Pang et al. (2014) found that, with the increase in professional titles, the job engagement of medical workers increases accordingly. Xu et al. (2012) evaluated the job engagement of medical workers in Shanghai hospitals with Gallup Q12, showing that the job engagement of employees with senior titles is higher than that of employees with intermediate and junior titles. Senior title-holders, who have experienced a long time of theoretical and practical study, have richer theories and more skilled techniques and therefore work with higher proficiency. Due to the special nature of the medical industry, medical workers with senior titles are also the first choice of patients and receive greater respect. Zhu et al. (2015) found that the influences that age, length of service and professional title exert on job engagement are highly consistent. Specifically, with the increase in age, length of service and professional title, job engagement exhibits a “U”-shaped trend of change, characterised by decrease from the high level, followed by subsequent increase. The family stress and job development pressure of employees in the intermediate age group and with intermediate titles are at high levels. As the “backbones” of hospitals, they are in the optimal rising stage of their careers, have high requirements for job returns, and tend to suffer from

unstable job performance and dissatisfaction with their own status, which further affects their job engagement. The present study found that the length of service and professional titles had no influence on job engagement. The reason may be that the research location is in a 3A maternal and child care hospital. Thus, the patients are mainly children and pregnant women whose conditions change rapidly, patient turnover is rapid, and medical workers at different ages, of different professional titles and with different lengths of service must all maintain a high level of engagement.

Hu et al. (2016) found that there are differences in the job engagement of medical personnel with different educational attainments, which is consistent with the results of the present study. However, Pang et al. (2014) found that an increase in educational attainments is associated with an increase in the job engagement of medical workers. Medical workers with high educational background tend to have relatively high requirements for themselves, set clear objectives for their jobs, and have a strong desire to make a difference in their positions. Besides, the longer cultivation period, higher educational background and longer schooling years the medical workers have, the better understanding and higher recognition they will have for the medical and healthcare industry, which will be demonstrated by higher dedication and recognition at work (Pang, 2014; Li-qing et al., 2015; Huang, 2017). Hu et al. (2016) found that there are differences in the job engagement of medical personnel with different educational backgrounds (Hu, Li, Lai, & Yang, 2016).

The results of the present study suggest that unmarried employees only receive clearly higher scores than their married counterparts in the basic job requirements dimension. There is no difference in the other dimensions. This could be because unmarried people lack companions to share their work with, are more likely to seek like-minded friends in the work environment, and can spend more energy on the hospital's teamwork. Several studies have found that there is no difference in the job engagement between medical workers of different types of marital status (Zhou, 2013; Pang, 2014; Hu, Li, Lai, & Yang, 2016). Nevertheless, Li (2011) found that the job engagement of married medical workers is higher than that of their unmarried counterparts. Li argued that this could be because most of the married medical employees, who are relatively old and have established their own families and tend to seek stable jobs, take work seriously; by comparison, unmarried medical employees, who are in the initial period of their career development and may not have any clear career planning, tend to exhibit turnover tendency and adopt a more irresponsible attitude towards work (Li, 2011).

With an increase in income, medical workers also show higher job engagement (Li, 2011;

Pang, 2014). Income is the external demonstration of competence and self-value. Medical workers work long hours and face high stress. If their income is not proportional to their input, their job initiative will be seriously undermined, resulting in decreased job engagement. Besides, most of the high-income medical workers are hospital backbones. Their business proficiency and rich experience enables them to serve patients and earn their respect, which will be reflected as a higher sense of responsibility and increased enterprise. By comparison, low-income medical workers might still need to struggle to earn a living, which to some extent undermines their job-related happiness, resulting in decreased job engagement. Having said that, the present study did not find that monthly income had any influence on the engagement of medical workers.

(2) Factors influencing job engagement-UWES

This study used the adjusted UWES-9 to evaluate the job engagement-UWES of hospital employees, with the total score being 28.38±11.59 points, at the upper-middle level. The results suggest that the job engagement-UWES of hospital employees of different educational attainments, professional titles, positions, lengths of service and monthly income differs.

With the increase in the length of service, job engagement-UWES exhibits a "U"-shape trend of change, characterised by decrease from the high level, followed by subsequent increase. Liu (2014) that the longer medical workers' lengths of service are, the higher their job engagement is. Apart from the low-length-of-service group, two studies found that medial workers' job in engagement gradually increases with the increase in their lengths of service. This might be because the increase in their lengths of service is followed by improved job skills, increased proficiency, and more work being undertaken. The salaries of people in this group also increase accordingly, alleviating their economic burden and lowering their life stress; as they gradually identify more with their work units and careers, they are more willing to invest time and energy at work. In the present study, medical workers with less than five years of work experience are categorised as the low-length-of-service group. Their high job engagement might be because their current employers and local governments have provided a lot of policy support for newly recruited medical workers, such as training and study, salary distribution support, and housing allowances, enabling medical workers with short lengths of service to have fewer concerns while continuously improving their own professional abilities. However, Liu (2014) found that the job engagement of the low-length-of-service group is relatively low, which might be related to the fact that medical workers with short lengths of service, who have

only recently entered the workforce, suffer from psychological gaps between the actual work and their expectations as low work enthusiasm; moreover, as they have just entered the workforce, their career planning is not yet taken shape. Instead, they are still in the exploration stage, which is characterised by strong mobility. Most of the studies on job engagement have been conducted among nurses and have found that, with the increase in nursing age and professional titles, the job engagement of nurses has exhibited an overall downward trend. Newly recruited nurses have enthusiasm and passion for their job and may demonstrate high vitality and dedication at work. Many will have also had a short length of service and face little stress from family, which gives them more time and energy to dedicate to their jobs. However, with the increase in the length of service, the everyday job content changes from new to repetitive and their family burden continues to increase, resulting in a downward trend in their decreased work enthusiasm, time and energy (Liu, Shang, & Zhao, 2013; Gao, Pu, & Zhao, 2015).

Fang et al. (2017) evaluated the job engagement of medical workers in Hangzhou and found that age also exhibits a "U-shape curve" changing trend in job engagement (Fang, Huang, & Du, 2017). Liu (2014) found that the older the medical workers get, the higher their job engagement becomes. This could be because young medical workers might still be in the exploration stage in their early careers. Faced with many external choices, they are not fully dedicated to their jobs. However, as they grow older, their job remuneration, social respect and work experience also increase accordingly. They will have accurate judgment of their positions and values and dedicate themselves fully to work, resulting in significant increase in their job engagement (Liu, 2014). Huang et al. (2012) studied 810 nurses and found that the total score of job engagement as well as the scores of dedication and concentration dimensions are positively correlated to age, whereas the score of vitality dimension decreases before increasing with the increase in age. The overall trends of the scores of job engagement-UWES are basically consistent, and both reach their peak among respondents aged over 50.

Chen's (2016) findings did not suggest any difference in the job engagement of people with different lengths of service and of different ages. However, job engagement differs between people of different genders and with different educational attainments. The present study found difference in the job engagement-UWES between male and female employees, but did find that educational attainment has influences on job engagement. To be specific, the job engagement of medical workers with high school diplomas or below is the lowest, and that of the medical workers with a master's degree or above is the highest. Medical workers with high school diplomas or below mostly engage in simple and repetitive work in the hospital and have

little room for promotion, whereas medical workers with a master's degree or above possess high professional skills and undertake challenging tasks. Medicine is a constantly developing discipline, so workers must continuously put in more time and energy for further education and study in their professional fields; also, most of the medical workers with a master's degree or above are clinical frontline staff. Given the increasingly tense doctor–patient relationships, they need to devote themselves to work in order to minimise possible doctor–patient conflicts (Khatri, Wells, Mckune, & Brewer, 2006; Mamuka, George, George, & George, 2008; Eljardali, Tchaghchagian, & Jamal, 2009; Townsend & Wilkinson, 2010).

The distribution characteristics of the job satisfaction and job engagement of medical workers with different demographic characteristics are different. There are some differences between the results of different studies, which could be caused by differences in research locations. For example, some studies were carried out in such Western regions as Tibet, whereas the present study is based in Shenzhen. Different regions differ from each other in terms of medical and healthcare policies as well as social, cultural and ecological factors; differences in the composition of respondents; and differences in the level of the target hospitals and their scope of service. Thus, the number of samples and the sample collection locations still need to be expanded to further explore the influences of demographic characteristics on the job satisfaction and job engagement of medical workers.

5.1.3 Human resource management have impacts on job satisfaction

This study adopted the adjusted HPWS questionnaire to discuss medical workers' perception of human resource management, with the total scores being 87.91±12.31 points. Through factor analysis, we finally divided the scale into three dimensions: recruitment and selection, promotion and training, as well as performance appraisal and salary management. Furthermore, correlation analysis, multi-factor linear regression and structural equation model were used to discuss the influences of HPWS total score of human resource management and the scores of each dimension on job satisfaction and job engagement.

Through investigation and analysis, the results of this study showed that each dimension of human resource management perception and their total scores are significantly positively correlated to the scores of job satisfaction. However, after adjusting the influences of general demographic characteristics (gender, length of service, marital status, monthly income, position, professional title age), the dimension of recruitment and selection is not correlated to

each dimension of job satisfaction and their total scores, whereas promotion and training, performance appraisal and salary management are significantly positively correlated to each dimension of job satisfaction and their total scores.

The results of studies carried out in many regions in China indicate that salary is the lowest dimension of the satisfaction of medical workers (Hou et al., 2013; Qiu et al., 2012; Yao et al., 2018; Zheng, Li & Zhang, 2014). Most medical workers serve patients and deal with diseases that affect people's life and health, which have the characteristics of high risks and high technicality; medical workers play a decisive role in the process of realising the "Healthy China" initiative. Therefore, in the new era, medical workers should enjoy relatively high status and income. However, in "The World Health Report 2000", the World Health Organization stated that China had provided 22 per cent of the world's population with basic medical services with around 1 per cent of the world's total health expenditure. Such a disparity is mainly the result of cutting down the expenditure on medical workers while catching up with international standards or even surpassing the average standards in foreign countries in terms of medical equipment, pharmaceuticals and devices (Meng et al., 2002). For a long time, due to the public welfare or non-profit nature of public hospitals, the pricing of medical services could not be regulated by the market like other services could. Medical workers have to undertake multiple tasks, including the diagnosis and treatment of common diseases and frequently occurring diseases, emergency rescue and severe cases, emergency medical rescue of sudden public health events, referral for difficult medical conditions as well as training and coaching of subordinates. Their high work intensity and heavy tasks form a contrast to their salaries and income, which significantly undermines their work enthusiasm and further lowers job satisfaction (Wu & Ou, 2014; Yu et al., 2018; Zhaxi et al., 2017).

According to Adams' "equity theory", employees in organisations are concerned not only with whether their efforts are valuable and whether they can gain returns, but also with whether their efforts and remuneration are fair compared to others. Besides, whether their remuneration is distributed according to their performance and whether there is a lack of fairness and rationality are also extremely important in salary distribution (Sewerin, Holmberg & Benner, 2009). The results of the present study have shown that some medical workers believe that salaries are not completely distributed based on performance, causing it to be unfair and unreasonable. This has not only resulted in decreased job satisfaction among medical workers but will also cause "complaints" in work environment and even lead to such overreactions as demotivation or intentional violation of hospital regulations. At present, the salary systems in

hospitals are divided into the salary system for professional and technical personnel, the salary system for management personnel and the salary system for workers, all of which are composed of fixed position (post) standard salary, allowance and service fee. Specifically, the position (post) salary and allowance follow the same salary policies as those of the administrative agencies and are uniformly adjusted and managed by the state government; service fee distribution is mainly based on the income and expenditure of each department, with reference to relevant indicators of economic benefits and in combination with management assessment indicators, without fully considering such factors as the responsibilities, complexity of technical labour, level of risks and amount of workload of different positions (Shen & Chen, 2006). Because of this, the differences in the salaries of personnel at the same levels are still not great, which means that the income of those true experts who can create benefits for hospitals and the society is at the same level as that of the personnel who are only mediocre in their businesses. This will inevitably cause medical personnel to regard salary distribution as unfair and unreasonable (Li & Xiu, 2003; Lu, 2005).

Economic status is the basis and symbol of social status. Without the guarantee provided by economic status, it is impossible to increase the social status of medical personnel. If the economic status and social status of medical personnel is not improved, their job satisfaction will hardly be increased.

With the continuous expansion of scientific research, medical diagnosis and treatment technologies continue to progress. Medical workers must update their knowledge reserve in a timely manner by participating in lectures, training sessions and further education projects so as to adapt to developments and satisfy the growing medical needs of patients. The top priority for hospital development is the development of its people. First, hospital management cannot provide the sustainable and effective external support environment needed for the ideal professional skills development of medical workers. The training content and plans designated by hospitals cannot meet the needs of most people. Medical workers must still spend some time and energy on this. Development of professional skills is regarded as medical workers' personal matters based on their personal qualities, alienating them from hospital development plans. Under the heavy load and high intensity of medical work, most medical workers lack the time and energy necessary to develop their proficiency further. If this situation continues, medical workers' enthusiasm for continuing education will be undermined, which will further lower their job satisfaction. Besides, under the current situation, scientific researches based on hospitals tend to seek quick successes and instant benefits. Scientific research is mostly a

"mandatory requirement" for the promotion of medical workers or hospital evaluation. It has not become a consensus among the vast majority of medical workers. Without time investment, idea guidance and fund support, scientific research will become an obstacle that is difficult for most medical workers to surmount and will lead to decreased job satisfaction among medical workers (Chen, 2008).

5.1.4 Human resource management have impacts on work engagement

(1) Influences of human resource management on job engagement-Gallup

Through investigation and analysis, the present study found that each dimension of human resource management perception and their total scores are all significantly positively correlated to each dimension of job engagement-Gallup and their total score. However, after adjusting the influences of the general demographic characteristics (gender, length of service, marital status, monthly income, position, professional title, age), the dimension of recruitment and selection is not correlated to each dimension of job engagement-Gallup and their total score, whereas promotion and training, performance appraisal and salary management are significantly positively correlated to each dimension of job engagement-Gallup and their total scores.

Salaries and welfare cannot only satisfy medical workers' requirements for basic necessities of life, but also meet their needs for self-respect and self-realisation. A good salary and welfare system can incentivise employees to some extent, strengthen their professional identity, encourage them to work harder and then increase employee engagement. Hospitals try to enhance medical workers' knowledge and skills as well as actively create improvement and promotion platforms and opportunities for them, which will influence their recognition of hospitals and further influence their job engagement.

The nature of hospital work means that medical workers need coordination between different departments in work. Coordination and mutual support between and within departments will directly affect the workers' satisfaction with and engagement in their jobs. Xu et al. (2012) found that team coordination is the second major factor influencing the job engagement of medical personnel. Zhou et al. (2013) found, through a study of private hospitals, that several aspects – the jobs themselves, salaries and welfare, personal growth and career development, organisational management system, leadership and management level and teamwork – are all positively correlated to job engagement. The results of this study indicate that the dimension of promotion and training has the strongest influences on the dimension of

teamwork, and the dimensions of performance appraisal and salary management has significant impacts on the dimension of teamwork, which is consistent with previous research results.

The management methods and abilities of leaders can influence hospital development and directly influence medical workers' satisfaction with and recognition of their organisation, their sense of responsibility and sense of belonging towards the organisation, and further influence employees' job engagement. The studies carried out by Lai et al. (2015) indicated that five factors – professional characteristics, relationship atmosphere, management and development, salary and welfare, and social respect – are significantly correlated to job engagement. Therefore, professional identity might be enhanced through deepening medical workers' understanding of medical work; efforts should be made to care about the relationships between and family lives of hospital colleagues and create a sound work environment for them. Leaders should fully respect employees' willingness and design reasonable career development paths for them in light of each person's situation. A reasonable salary incentive mechanism should be established with flexible and variable welfare measures to demonstrate their abilities and values and reduce the sense of salary unfairness. Finally, measures should be taken to improve doctor–patient relations from various aspects, establish a stable work atmosphere and increase doctors' social respect and recognition so as to increase the job engagement of medical workers.

(2) Influences of human resource management on job engagement-UWES

Through investigation and analysis, this study has discovered that there is a markedly positive correlation between each dimension of human resource management perception and their total score and the scores of job engagement-UWES. However, with the impact of general demographic characteristics (gender, length of service, marital status, monthly income, position, professional title and age) adjusted, the dimension of recruitment and selection is not correlated with each dimension of job engagement-UWES and their total score. Promotion and training, performance appraisal and salary management are markedly correlated with each dimension of job engagement-UWES and their total score.

As a comprehensive human resource management practice, the high-performance job system scientifically manages recruitment, occupational safety, performance appraisal and salary management in an organisation. Through structural equation modelling, Fang et al. (2017) evaluated the impact of a high-performance job system upon job engagement of employees. Their findings suggest that the total effect of perception of high performance job system on job engagement is 0.63, with the direct effect being 0.24; the indirect effect of the

concern about staff atmosphere as a mediator variable is 0.39. In other words, more concern about staff atmosphere may improve employees' sense of belonging and loyalty towards an organisation, which then encourages them to work hard with greater job engagement. This is consistent with the conclusion of Zhang et al. (2013). Liu (2017), from the perspective of psychological capital, explored the relationship between organisational support and job engagement. Their results indicate that organisational support not only has a direct influence on employees' job engagement but also indirectly affects their job engagement through psychological capital. Organisational support refers to concern, care and consideration from material and spiritual aspects shown by an organisation towards subordinates as well as experienced and perceived by individual subordinates (Liu, Song & Chen, 2017). The two above-mentioned studies mention improving and showing concern about employees' surroundings, raising employees' psychological capital, encouraging employees' sense of belonging to a hospital, enhancing a sense of dedication and heightening employees' job engagement. From the perspective of human resource management, the above objectives can be achieved by means of fair and reasonable performance assessment and salary management and tailor-made training and promotion system.

5.2 managerial implications

5.2.1 Implications for the hospital management

(1) Try to sway public opinion and to raise the public recognition of the doctor community

When the sense of professional recognition runs low for the doctor community, this would have an impact on the stability of the doctor team in a hospital. It is important to establish a healthy and reasonable relationship between the doctors and the patients within a community. It is crucial for the society to understand the professional characteristics of the doctors and to enhance their professional dignity. On June 11, 2016, Renjianshi, a health care documentary that was shot in several Grade 3 Class A hospitals in Shanghai, began broadcasting and became very popular. It had a great deal of impact on the public such as reestablishing their respect for the health care professionals and inspiring them to take a hard look at the health care industry. The advice for the relevant government departments and the hospitals is to focus on public opinion, as they should make greater efforts on publicity and release documentaries that reflect

the work and life of the health care professionals working in Shenzhen. This will not only be conducive in establishing a healthy and sound relationship between the health care professionals and the patients in our society, but will also be beneficial to raise the professional recognition of our health care professionals. Moreover, it will raise the profile of health care professionals working in Shenzhen and help health care graduates from other provinces to better understand the health care industry in Shenzhen.

(2) To raise the compensation package for the doctors and to improve the motivation system

The advice is to speed up the human resource system reform in the hospitals and to gradually phase out the difference in employee status. On the basis of maintaining employees' current remuneration and basic benefits, the hospitals should undergo comprehensive reform to the human resource system in public hospitals by introducing meaningful changes to the right to set up new posts, the right for public recruitment, the right to review professional ranks, the right to salary distribution, the right to personnel assignment as well as the employee entry and exit mechanism.

(3) To continue to provide "On-the-job-training" and to initiate overseas study program for doctors, to raise the level of internationalization

Employee training has always been an essential component of human resource management. The government can initiate overseas study program for doctors. By establishing partnerships with well-known medical education institutions abroad, the hospitals can provide more on-the-job-training and build research base for hospital management. The hospitals should also explore professional training models that are in line with international standard in order to raise the job satisfaction of the doctors.

All in all, based on the above findings, as an integrated human resource management system, the high performance work system can effectively raise the job involvement and job satisfaction of health care professionals. The hospital management team should adopt more scientific management approaches by creating a positive organizational climate that respects and cares about its employees, so they would be more willing to bear more responsibility and enjoy their work.

5.2.2 Implications for human resource management department in hospitals

The findings also have implications for human resource management department in hospitals as follows,

(1) Building an HPWS to improve human-resource management practices and raise the standards of hospital management

Parts of high performance work system that are related to recruitment, promotion and performance assessment are conducive to raise the employees' individual performance and organizational performance. This research has found that health care professionals' perception of high performance work system has a positive impact on their job involvement and job satisfaction. For that reason, the hospital management should adopt more scientific hospital management practices. By having fair and transparent recruitment and promotion systems, comprehensive performance assessment schemes, fundamentally sound job security and safe working environment, clear and precise job descriptions, the management team should strive to simplify the management flow and to raise management efficiency so that the health care professionals can devote more energy and efforts into their own work. This will in turn raise the standard of hospital management.

(2) Focus on organizational climate and to nurture a climate that is caring to employees

Work atmosphere describes employees' experience of their working environment. Having a positive work atmosphere would enable employees to grasp the attention and care from the organization. They would then discover their sense of belonging and become more loyal to the organization, while working more proactively. For that reason, the hospital management team should not only focus on improving the knowledge and skills of their health-care professionals, but also treat their employees as the center of their attention to understand what go through their minds and provide emotional support. Management should strive to create an open, warm atmosphere so that each health-care professional considers themselves an owner of the hospital. This is conducive to improving their job involvement and satisfaction.

(3) A reasonable overtime and night shift system

If the hospital is operating smoothly, management should adopt a reasonable overtime and night-shift system that is in line with human-resource and surgical needs. It is inevitable that health-care professionals sometimes must work overtime or night shifts but if they do not

have enough rest, their health is at risk and increases the risk of medical error that is detrimental to the health of their patients. More disputes might arise between the hospital and their patients. Therefore, the hospital should adopt a sound overtime and night-shift system to ensure the hospital runs smoothly and does not jeopardize the health of its staff. When health-care professionals receive adequate rest, they are able to work more efficiently, which should improve patient health.

(4) To take advantage of the leadership and guidance of senior medical staffs

Senior medical staff comprises seasoned professionals who have worked extensively in the hospital and can provide valuable leadership and guidance in the clinical field. However, many hospitals ask senior medical staff to switch to administrative management departments after turning a certain age. Since some might lack professional management experience, they might have trouble coping with this change, as they still need to undertake some of their clinical duties. It is worth exploring if they have sufficient time and energy to cope with this transition. For that reason, management team should consider allowing these senior medical staff members to switch to scientific research positions. This would not only be conducive to their clinical duties, but also be beneficial for administrative management. Ultimately, this would be helpful to overall hospital development.

5.2.3 Implications for human resource management increasing the satisfaction and engagement of hospital employees

Based on the results of this study, I propose the following strategies and suggestions related to human resource management in order to improve employee satisfaction and engagement.

First, correctly define the functions of the human resource management department and improve the professionalism of human resource management personnel. Human resource management, which has become the core resource of hospitals, is the key to a hospital's sustainable development. Compared with traditional ways of personnel management, human resource management in a modern hospital is moving towards corporate labour management, with a wider scope of work as well as increased intelligence and standardization. Human resource management departments need to study and understand new concepts of management in depth, redefine department functions and assume their due responsibilities. A transition from simple arrangement of human resource information to collection and analysis of human

resource information is required. HR departments should also realise that talented personnel are their primary resource and their ability to control and coordinate should be brought.

With the establishment and continuous improvement of China's market economy, division of labour in all social fields is increasingly refined, which makes specialisation of employees in relevant fields a major trend of economic and social development. At present, most of the personnel in charge of a human resource management department and employees are not specialised professionals and lack adequate professional knowledge. For a long time, the medical system has regarded technology as a priority while de-emphasising the importance of management. As competition in the domestic medical market becomes increasingly fierce, higher demands are imposed on hospital managers. Traditionally minded hospital managers are no longer able to deal with the market economy environment, which may even stand in the way of hospital development to some extent. Therefore, hospitals should vigorously introduce specialised managers, promote current employees' re-education and training in management and related fields, professionalise hospital managers, launch HR reform throughout the hospital, stimulate scientific management, fundamentally change popular misunderstandings of HR management, and facilitate reform of the management system and favourable competition (Liu, 2015; Xiao, 2006; Xing, Liu, Ba & Ahehu, 2018). Xu et al. (2012) studied the influence of leadership style on job engagement and found a markedly positive correlation between reform-minded leadership and job engagement. Reform-minded leadership includes the following four aspects: exemplary moral behaviour, vision planning, charismatic leadership and personalised concern. Leaders need to improve their own quality and place high demands on themselves so as to positively motivate hospital employees and stimulate their job engagement through trust and management.

The second strategy is to establish a scientific performance appraisal system and a reasonable salary system. Previous investigations have revealed that the HR management system that medical workers want to improve most is the individual salary system (Han, Fang & Feng, 2013; Wu & Li, 2015). In the current system, people place equal emphasis on the quality of life and work. Even medical workers with high self-realisation motivation also pursue higher income and higher quality of life. Therefore, it is necessary to introduce corresponding policy regulations to vigorously improve the economic status and material benefits of medical workers. Seen from the specific situation of the hospital in the present study, both performance appraisal and salary management are significantly correlated to job satisfaction, job engagement and their correlation to the total score of human resource

management perception is as high as 0.83. Therefore, the Central Government, local governments and hospitals all need to introduce relevant policy regulations to enable medical workers' salary distribution to fully reflect their professional values, improve their salaries, welfare and social status, improve their living and working conditions if they are to increase the job satisfaction and engagement of medical workers in the central region. Financial compensation measures and proportions should be clarified; a new financial compensation mechanism should be established; and the salaries and allowances of medical workers in areas of high consumption should be increased in the form of salary, subsidies, medical insurance and living allowances.

Salary management within a hospital should be fair internally and competitive externally. It is necessary to perfect the current system of salary distribution management by considering the difficulty of specific work, intensity of labour, proportions of risks and responsibilities, as well as quality and quantity of finished work. Besides, different methods of performance distribution should be worked out according to different positions, educational backgrounds and professional titles. At the same time, emphasis should be given to positions that are short-handed, high-risk and have great intensity, and on employees with outstanding performance. The process of salary distribution should be open by publicising criteria in order to encourage healthy competition among employees and increase work initiative and efficiency. In general, a reasonable salary management system should be integral, focusing on various salary elements that may affect performance; serve as an incentive, enabling employees with remarkable performance to receive generous rewards while reducing rewards for those with inadequate performance; be flexible by designing different solutions according to different requirements so as to assist hospitals to adapt more readily to the changing environment and patients' needs; and be strategically forward-looking, which means that depending on the hospitals' strategies and objectives, it must play a good guiding role so as to better support the hospital's strategies and various management measures.

It is necessary to set up a scientific performance appraisal system that reviews such elements as specialty, management and attitude. This standard and procedure must also be publicised to demonstrate transparency. Results of performance appraisals should be linked to salary, promotion, reward and punishment in order to improve the incentive effect, reasonably widen the income gap, and adequately arouse employees' work initiative and potential in order to increase their job satisfaction and job engagement. The setting of indicators for the performance appraisal system should be clearly defined and quantified as much as possible. It

should match with the main responsibilities of employees, without being too high or too low. Besides, it should be adjustable with variations of employees' functions to remain time-effective. In addition, efforts should be made to strengthen the supervision of appraisers in the process of performance appraisal and establish a supervision mechanism to ensure its fairness and justice.

The third strategy is to attach importance to cultivating medical employees. The results of this study show that promotion and training is markedly correlated to each of the other two dimensions (that is, job satisfaction and job engagement), and its correlation with the total score of human resource management perception is as high, at 0.88. Talents are the vital strength for hospital competition. A hospital must increase the value of its medical employees and create an environment conducive to their growth and development if it is to achieve complementarity and mutual progress.

According to Maslow's hierarchy of needs theory, the high-level needs of medical employees should be satisfied as much as possible. These needs depend not only on rich material remuneration, but also foreseeable prospects and the attractiveness of career development. Based on their development strategies, hospitals should help medical employees work out corresponding career development plans so that they can form a community of interests between their professions and hospitals, and make their personal goals consistent with hospital development goals. It is necessary to formulate training plans for employees at different positions and actively recommend, support and encourage medical employees to exchange and study regularly at excellent medical institutions, both at home and abroad, so as to enhance their work abilities and efficiency. In addition, a good internal environment for academic exchange must be fostered to promote academic exchanges among employees, invigorate medical employees and increase their work initiative.

Under the premise that the system for the advancement of professional titles meets the development needs of a hospital, it is advisable to provide a sound competitive environment for on-the-job employees and optimise the mechanism of hierarchical employment. A fair and transparent mechanism of promotion should also be provided and medical workers' enthusiasm and initiative be mobilised through regular competition for employment.

Besides training professional skills of medical employees, attention should also be given to developing hospital culture and values. Medical employees have certain beliefs and values. Human resource management driven by hospital culture should, starting with a recruitment phase, foster education of hospital culture and values, cultivate hospital spirits, encourage

employees to genuinely identify with the hospital culture and identify with the job responsibilities assigned by the hospital. Only in this way can their potential be tapped to the fullest extent to serve the patients with increased job engagement.

In addition, it is necessary to pay attention to the mental state of medical employees. In a work environment with sometimes tense relationships between doctors and patients, medical employees are under high pressure for long periods. From the perspective of positive psychology, Liu (2014) found that the atmosphere of medical employees' psychological and social security functions is a positive factor to their job engagement improvement. Creating a sound environment with psychological and social security in a workplace can mobilise employees' vitality and enthusiasm for work. A harmonious doctor–patient relationship enables medical employees to have a good work atmosphere with sufficient social respect and mental support during their communication with patients. However, an unfavourable doctor–patient relationship will dampen enthusiasm and reduce the job satisfaction of medical employees, and also reduce the quality of medical services; doctor–patient relationships further worsen when patients' demands go unmet, thereby forming a vicious circle (Mo, Xu, Luo & Gai, 2015; Xing, 2016). The results of the study carried out by Ma et al. (2018) indicate that the doctor–patient relationships perceived by medical workers, their job satisfaction and job engagement are correlated, that improvement of doctor–patient relationships and motivation of employees' job engagement are positive contributors to job satisfaction, and that job engagement can also positively influence the doctor–patient relationships perceived by medical workers and their job satisfaction. The doctor–patient relationships perceived by medical workers can function as a mediating variable, serving as an intermediary variable between job engagement and job satisfaction to play a regulating effect. Their findings are consistent with Chen's (2016) results. Based on this, in addition to measures taken at the national level such as increasing investment in medical treatment and healthcare, expediting training of health personnel, and improving medical legislation and system construction, a hospital should also perfect the mode of human resource management, pay attention to the mental health of medical employees and improve its communication during skill training. For example, efforts should be made to train psychological counsellors and produce a group of professional talents who have mastered theories and skills of psychological counselling in a hospital. Such measures not only help to smooth out the psychological problems of patients and their families, but also facilitate psychological counselling for other employees. Lectures and training courses in psychology should be actively provided or psychological training should be incorporated in job skills

training where medical employees are encouraged to participate so that they can develop skills for emotion management and pressure adjustment. Meanwhile, measures should be taken to understand the difficulties medical employees face in their work and life from various aspects, give them corresponding support, and learn about the mental state of medical employees dynamically in order to discover and solve problems in a timely manner.

5.2.4 Implications for hospital employees satisfaction management in hospitals

(1) ***Conduct regular, continuous employee-satisfaction investigations***

Satisfaction is a dynamic concept that changes as the hospital's internal and external factors change. Therefore, hospitals should carry out employee-satisfaction investigations frequently to identify the potential problems and make improvements. Rectification measures and plans should then be formulated, based on the problems found in the investigations.

(2) ***Establish a reasonable, fair three-in-one system for position, performance, and payoff***

Position, performance, and payoff systems are the core content for human-resource management. Position management is the basis for human-resource management and the premise for both performance and payoff management systems. Performance management is the evaluation basis for human-resource management, and payoff management is the key to human resource management.

(3) Position management

Managers should ensure that employees are properly matched to their positions through such means as examination, selection, employment, and training. Position management is usually divided into three parts. The first is *position-process optimization*. In light of hospital reality, existing positions can be optimized by increasing, reducing, or changing some positions to smooth the out process. The second is *position analysis*, the purpose of which is to form position descriptions and standardize job management. Position descriptions normally contain the status of the position in the organization; its work relationships with other positions; and position duties, tasks, job objectives, environment, conditions, and competency requirements. The third part is *position evaluation*, which entails evaluating the roles and values of each position in the organization, according to posted descriptions and establishing a position hierarchy system to provide a basis for performance appraisal and salary management.

(4) ***Performance management***

Managers should establish scientific, reasonable, and strongly operable performance appraisal indicators. These indicators should be quantified as much as possible to ensure the fairness of the examination. After establishing the indicator system, it is necessary to reduce appraisal errors and failure while executing the examination and evaluation. Therefore, performance management requires three steps: (1) connect with the hospital information system to reduce human errors with IT; (2) strengthen training for appraisers and reduce appraisal errors; and (3) combine appraisal results with payoff management and the hospital's development and strategies.

(5***) Payoff management***

Hospital payoff is normally divided into economic and non-economic payoff. The former term refers to employees' salaries, bonuses, welfare, allowances, options, and other material benefits distributed in various indirect currencies. *Non-economic payoff* refers to the psychological reward that employees obtain from their jobs. Employees work hard and receive praise, promotion, and attention. As a result, they feel a sense of satisfaction, achievement, responsibility, competence, making valuable contributions, social influence on their jobs and gaining respect from society and career development opportunities. The key to payoff management is to study the structure of payoff so as to enable each parts or the whole to bring out strong incentives to continuously mobilize employees' enthusiasm, initiative, and creativity. Payoff management should also reflect its fairness and rationality inside the organization to stabilize and retain talent. It should be externally competitive to attract various kinds of talent.

(6) ***Improve hospital work environment***

A work environment is considered to be either soft or hard. A *soft environment* mainly refers to interpersonal relationships and atmosphere, whereas a *hard environment* refers to working conditions and regulations. The degree of harmony between people affects employee satisfaction to some extent. Employees hope to gain trust, support, and guidance from their superiors, mutual understanding between colleagues, and coordination with subordinates. Therefore, hospitals must maintain good inter-hospital public relations, and closely connect intra-hospital public relations with hospital culture development to form a united, harmonious and uplifting hospital image. The hospital information system should ensure smooth and accurate information transmission and information disclosure, as well as increase employees'

understanding of, and support for the hospital. The hard environment consists of the physical conditions, working hours and attended time, and if the conditions, equipment and other resources required for work are fully equipped. Therefore, hospitals must urge relevant functional departments to closely investigate the grassroots work environment closely and increase input to improve office and lounge infrastructure. This can not only eliminate safety hazards, but also arouse employee enthusiasm. It is also positive for advocating hospital spirit and culture. When adopting a flexible and fair work timetable, managers not only must include the hospital's needs, but also those of employees' families, individuals, and the relationships between employees.

(7) Provide training and learning opportunities

Relying on advanced instruments and equipment is not enough to hospital development. The key is to regard employees' development as the basis of hospital development. It is necessary to increase capital input in employee development and provide employees with rich training and learning opportunities. Employee development can also satisfy employees' emotional needs, such as achieving self-development and embodiment of their values. Specific practices for providing training and learning can be:

(1) *Institutionalization*: Determining staffing and positions in the form of institutional specifications and providing business knowledge and special skills training on a regular basis

(2) *Form diversification*: Development using traditional classrooms, bulletin boards and brochures, as well as digital equipment, remote education, multimedia, and libraries.

(3) *Fairness*: Employees' development should be overall comprehensive. They should enjoy equal learning and training opportunities. Employees should not lose the opportunities to learn, due to their positions, seniority, or inadequate relationships. The hospital should maintain fairness in this regard.

(4) *Pertinence*: The training should be connected to the performance appraisal feedback for targeted learning.

(5) Feedback: An examination process is needed to determine the training results. A comparison can be made between the performance appraisal results before training and those after training to identity achievements and deficiencies. Experience-sharing sessions can also be carried out to enable trainees to share with others what they learned.

To sum up, competition in the medical market is becoming increasingly fierce. As a result, the requirements for hospital human resource management are also getting higher. Only

through continuous development and constant improvement in various aspects can hospital human resource management keep up with developments, meet the needs of medical employees, increase their job satisfaction and engagement, and ultimately provide patients with more effective services of higher quality.

5.3 Limitations of this research

This study has certain limitations. First, this research adopted a questionnaire survey and used cross-sectional study to gather the distribution of research variables. In addition, the information is self-reported. These will inevitably produce information bias. Besides, most of the scalars of this study are comments of subjective feelings, which are subject to the influences of positive or negative emotions in the short period and thus undermine the accuracy of the research results.

Second, the respondents in this research are only employees of 3A hospitals. The influences of human resource management on job satisfaction and job engagement in hospitals of different levels may differ and compromise the generalisation of the research results.

5.4 Suggestions for further study

There is much worthy of future study. First, on the basis of enlarged sample volume and widened research locations and after controlling the influences of mixed factors as much as possible, efforts can be made to further validate the conclusion of this research among different groups of people. Second, follow up on the research results. The same scales should be used repeatedly to measure employees' human resource management perception and their job satisfaction and engagement. Future studies should also seek to obtain relatively stable data. Third, on the basis of the research results, conduct intervention studies in 3A hospitals to comment on the intervention effects so as to further formulate comprehensive and effective intervention strategies and measures for increasing employee satisfaction and engagement.

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Appendix

The Survey on the Impact of Hospital's Human resource Management on the Satisfaction and Engagement of Medical Staff

1. Your feeling about your work

The following 17 statements are about how you feel at work. Please read each statement carefully and decide if you ever feel this way about your job. If you have never had this feeling, cross the '0' (zero) in the space after the statement. If you have had this feeling, indicate how often you feel it by crossing the number (from 1 to 6) that best describes how frequently you feel that way.

	Almost never	Rarely	Sometimes	Often	Very often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

1. _____ At my work, I feel bursting with energy.

2. _____ At my job, I feel strong and vigorous.

3. _____I am enthusiastic about my job.

4. _____My job inspires me.

5. _____When I get up in the morning, I feel like going to work.

6. _____ I feel happy when I am working intensely.

7. _____ I am proud on the work that I do.

8. _____I am immersed in my work.

9. _____ I get carried away when I'm working..

2. Your opinion on the hospital's human resource management

The following 21 statements are about how you opinion about the hospital's human resource management. Please read each statement carefully and decide if you ever feel this way about your job.

Please rate each statement between 0 to 6 based on your degree of agreement with it. Indicate to what degree you agree by marking the number (from 1 to 7) that best describes your feeling. The bigger the number, the higher the Grade or Degree

1	2	3	4	5	6	7
Strongly disagree	disagree	less disagree	general	more agree	agree	Strongly agree

1. _____ Employees are involved in job rotation.

2. _____ Employees are empowered to make decisions.

3. _____ Jobs are designed around their individual skills and capabilities.

4. _____ Selection is comprehensive (uses interviews, tests, etc.).

5. _____ Selection emphasizes their ability to collaborate and work in teams.

6. _____ Selection involves screening many job candidates.

7. _____ Selection focuses on selecting the best all-around candidate, regardless of the specific job.

8. _____ Selection emphasizes promotion from within.

9. _____ Selection places priority on their potential to learn (e.g., aptitude).

10. _____Training is continuous.

11. _____ Training programs are comprehensive.

12. _____ Training programs strive to develop firm-specific skills and knowledge.

13. _____ The training programs emphasize on-the-job experiences.

14. _____ Performance is based on objective, quantifiable results.

15. _____ Performance appraisals include management by objective with mutual goal setting.

16. _____ Performance appraisals include developmental feedback.

17. _____ Incentives are based on team performance.

18. _____ Compensation packages include an extensive benefits package.

19. _____Our compensations include high wages.

20. _____The incentive system is tied to skill-based pay.

21. _____Our compensation is contingent on performance.

3. Survey on the satisfaction of medical staff

The following 20 statements are about your satisfaction about your job. Please read each

statement carefully and decide if you ever feel this way about your job.

Please rate each statement between 1 to 5 based on your degree of agreement with it. Indicate to what degree by marking the number (from1 to 5) that best describes your feeling about your job. The bigger the number, the higher the grade or satisfaction.

5	4	3	2	1
Extremely Satisfied	Very Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied

1. _____Being able to keep busy all the time.

2. _____The chance to work alone on the job.

3. _____The chance to do different things from time to time.

4. _____The chance to be “somebody” in the community.

5. _____The way my boss handles his/her workers.

6. _____The competence of my supervisor in making decisions.

7. _____Being able to do things that don’t go against my conscience.

8. _____The way my job provides for steady employment.

9. _____The chance to do things for other people.

10. _____The chance to tell people what to do.

11. _____The chance to do something that makes use of my abilities.

12. _____The way company policies are put into practice.

13. _____My pay and the amount of work I do.

14. _____The chances for advancement on this job.

15. _____ The freedom to use my own judgment.

16. _____The chance to try my own methods of doing the job.

17. _____The working conditions.

18. _____The way my co-workers get along with each other.

19. _____The praise I get for doing a good job.

20. _____The feeling of accomplishment I get from the job.

4. The advantages of working place and the degree of engagement

5	4	3	2	1	0
Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree	Don't know

1. _____I know what is expected of me at work.
2. _____I have the materials and equipment I need to do my work right.
3. _____At work, I have the opportunity to do what I do best every day.
4. _____In the last seven days, I have received recognition or praise for doing good work.
5. _____My supervisor, or someone at work, seems to care about me as a person.
6. _____There is someone at work who encourages my development.
7. _____At work, my opinions seem to count.
8. _____The mission or purpose of my company makes me feel my job is important.

9. _____My associates or fellow employees are committed to doing quality work.

10. _____I have a best friend at work.

11. _____In the last six months, someone at work has talked to me about my progress.

12. _____This last year, I have had opportunities at work to learn and grow.

5. Interviewee Information

1. Gender：①Male ②Female

2. Age：①Under 22 ②from 22 to 30 ③ from 30 to 40 ④ from 40 to 50 ⑤above 50

3. Marriage status: ① Not married ② Marrried

4. Education Level：①High school or lower ②College ③Bachelor ④Master

5. Title： ①Primary ②intermediate ③Secondary Senior ④Senior

6. Position：①Clinical doctor ②Nurse ③Medical technician

④Administrative Staff ⑤Logistics staff

7. Working years：① 0-5 years ② 6-10 years ③ 11-15 years ④ above 15 years

8. Actual income per month (yuan):

① Below 3000； ② 3000-5000； ③5001-8000； ④8001-12000； ⑤ above 12000