

**Doctor–patient Relationship, Leader–member Exchange,  
Occupational Commitment, Turnover Intention  
– A Study of Public Hospital Doctors in China**

**ZENG Weilong**

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

**Doctor of Management**

Supervisor:

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July, 2018





**Instituto Universitário de Lisboa**

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## Declaration

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

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## Abstract

The strained doctor–patient relationship(DPR) negatively affects doctors’ occupational commitment (OC) and turnover intention (TI), which affects the achievement of the goals of Healthy China 2030. Therefore, determining ways of improving DPR and doctors’ OC and reducing TI is very important for achieving these goals. In the present study, two rounds of surveys were conducted among doctors at the Fourth Affiliated Hospital of Guangxi Medical University. Three hundred and eighty-one valid questionnaires were collected over a period of three months, to explore the relationship between leader–member exchange (LMX), DPR, OC, and TI, using correlation analysis, variance analysis, exploratory and confirmatory factor analysis, and structural equation modeling (SEM) methods.

The analysis results show that the China-specific doctor-based DPR scale has two dimensions with good validity and reliability. There is a significantly positive relationship among LMX, DPR and OC; they are all negatively correlated with TI. According to SEM, the impact paths of DPR between LMX and OC include: LMX→DPR ( $\beta=0.35$ ), DPR→OC ( $\beta=0.73$ ); the overall impact effect is 0.252; the impact paths of DPR between LMX and TI include: LMX→DPR, DPR→TI ( $\beta=-0.25$ ), LMX→TI ( $\beta=-0.23$ ); the overall impact effect is -0.317 and the mediating effect accounts for 27.76 percent of the overall effect.

Research results reveal LMX positively correlates to DPR; DPR plays a partially mediating role between LMX and TI and a full mediating role between LMX and OC. This thesis offers suggestions for improving DPR and OC and reducing TI on management practice.

**Keywords:** Chinese DPR; DPR measurement; DPR; LMX; OC; TI

**JEL:** M54; M12



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## Resumo

A relação entre médico e paciente (RMP) afeta negativamente a implicação ocupacional dos médicos (IO) bem como a intenção de saída (IS), o que afeta a consecução dos objetivos da China Saudável 2030. Assim, é muito importante identificar formas de melhorar a RMP e a IO bem como reduzir a IS para atingir estes objetivos. No estudo presente, foram realizadas duas ondas de inquéritos entre médicos no 4º Hospital Afiliado da Universidade Médica de Guangxi. Foram recolhidos 381 questionários válidos durante um período de três meses, para explorar a relação entre a troca líder-membro (LMX), a RMP, a IO e a IS, utilizando análises correlacionais, análises de variância, análises fatoriais exploratórias e confirmatórias e técnicas de Equações Estruturais (SEM).

Os resultados das análises indicam que a escala de RMP especificamente para a China tem duas dimensões com boa validade e fiabilidade. Há uma relação positiva significativa entre LMX, RMP e IO; todas estas estão negativamente correlacionadas com a IS. De acordo com a SEM, as vias de impacto da RMP entre a LMX e a IO incluem: LMX→DPR ( $\beta = 0.35$ ), RMP→IO ( $\beta = 0.73$ ); o efeito total de impacto é de 0.252; as vias de impacto da RMP entre LMX e IS incluem: LMX→RMP, RMP→IS ( $\beta = -0.25$ ), LMX→IS ( $\beta = -0.23$ ); o efeito total de impacto é de -0.317 e o efeito de mediação explica 27.76% do efeito total.

Os resultados mostram que a LMX está correlacionada positivamente com a RMP; que a RMP é um mediador parcial entre a LMX e a IS mas que é um mediador total entre a LMX e a IO. Com base nestes resultados sugerem-se recomendações para a prática de gestão para melhorar a RMP e a IO e para reduzir a IS.

**Palavras-chave:** relação entre médico e paciente (RMP); implicação ocupacional; intenção de saída (IS); relação entre a troca líder-membro (LMX).

**JEL:** M54; M12

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## 摘要

中国当前紧张的医患关系，影响着医生的职业和工作满意度。而健康中国 2030 目标的实现与医生的职业和工作满意度密切相关。因此，如何提高医生医患关系和职业承诺水平，降低离职倾向，对于实现健康中国 2030 目标具有重要意义。本研究以中国广西医科大学第四附属医院的医生为研究对象，以员工证号来匹配，对同一批医生开展前后间隔三个月的两轮问卷调查，共获得有效问卷 381 份，来研究医生的领导部属交换关系、医患关系、职业承诺、离职倾向的关系。采用相关性分析、方差分析、探索性因子和验证性因子分析、结构方程模型等方法进行分析。

分析结果显示：中国情景下医患关系（医生视角）量表包含“医患信任”和“以患者为中心的诊疗能力”两个维度。量表具有良好的信度和效度。领导部属交换关系、医患关系、职业承诺之间存在显著正相关性；领导部属交换关系、医患关系、职业承诺与离职倾向存在显著负相关性。结构方程模型分析结果显示，医患关系在领导部属交换关系对职业承诺影响路径中包括：领导部属交换关系→医患关系( $\beta = 0.35$ )，医患关系→职业承诺( $\beta = 0.73$ )，总体影响效果为 0.252；医患关系在领导部属交换关系对离职倾向影响路径中包括：领导部属交换关系→医患关系，医患关系→离职倾向( $\beta = -0.25$ )，领导部属交换关系→离职倾向( $\beta = -0.23$ )，总体影响效果为：-0.317，中介效应占总效应 27.76%。

研究表明，领导部属交换关系与医患关系正向相关，医患关系能部分中介领导部属交换关系对医生的离职倾向影响，能完全中介领导部属交换关系对医生的职业承诺影响。医患关系对医生职业承诺的影响要大于离职倾向。基于以上的研究结果，讨论提高医生医患关系、职业承诺水平，降低离职倾向的管理实践启示和建议。

关键词：中国医患关系；医患关系测量；医患关系；领导部属交换关系；职业承诺；离职倾向

JEL: M54; M12



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# Contents

Chapter 1: Introduction .....	1
1.1 Research background .....	1
1.2 Research dilemma .....	3
1.3 Research questions .....	6
1.4 Research objectives .....	6
1.4.1 Theoretical significance.....	7
1.4.2 Management practice significance .....	7
1.5 Thesis structure.....	8
Chapter 2: Literature Review .....	9
2.1 Doctor–patient Relationship.....	9
2.1.1 Concept definition of DPR .....	9
2.1.2 China’s strained DPR .....	12
2.1.3 DPR-related stakeholders .....	17
2.1.4 Measurement of DPR .....	22
2.1.5 Research review .....	24
2.2 Leader–member exchange.....	25
2.2.1 LMX .....	25
2.2.2 Development of LMX .....	27
2.2.3 LMX structure and measurement .....	28
2.2.4 Antecedents of LMX .....	31
2.2.5 Effect of outcome variables of LMX and impact mechanism.....	35
2.2.6 LMX research review .....	38
2.3 Occupational commitment .....	39
2.3.1 Concepts .....	40
2.3.2 Theory of OC and measurement.....	41
2.3.3 Antecedent and outcome variables of OC .....	47
2.3.4 Research review of OC.....	55
2.4 Turnover intention .....	56
2.4.1 Definition of TI.....	56
2.4.2 Models of turnover .....	57

2.4.3 Antecedents of TI .....	61
2.4.4 Measurement of TI .....	65
2.4.5 Research review of TI .....	66
2.5 Conservation of resource theory.....	67
2.5.1 Definition of resources .....	67
2.5.2 Core ideas of COR theory .....	68
2.5.3 Principles of resources conservation .....	69
2.6 Social exchange theory.....	70
2.6.1 Main contents of modern social exchange theory .....	70
2.6.2 Social exchange theory and LMX .....	71
2.7 Hypotheses .....	72
2.7.1 Hypothesized relationship between LMX and DPR .....	72
2.7.2 Hypothesized relationship between LMX and OC.....	73
2.7.3 Hypothesized relationship between LMX and TI .....	74
2.7.4 Hypothesized relationship between DPR and OC.....	74
2.7.5 Hypothesized relationship between DPR and doctors' TI.....	76
2.7.6 Hypothesized relationship between LMX and OC, TI, with DPR playing a mediating role.....	76
Chapter 3: Research Methods.....	79
3.1 Questionnaire survey .....	79
3.1.1 DPR questionnaire design and measurement .....	79
3.1.2 LMX measurement.....	82
3.1.3 OC measurement .....	83
3.1.4 TI measurement .....	83
3.1.5 Control variables .....	83
3.2 Basic information of surveyed hospital and data collection.....	84
3.3 Quality control.....	84
3.4 Statistical methods.....	85
3.4.1 Questionnaire reliability analysis .....	86
3.4.2 Validity analysis.....	86
3.4.3 Descriptive statistical analysis.....	87
3.4.4 Analysis of correlation between measured variables .....	87
3.4.5 Independent sample T-test and One-way ANOVA.....	87
3.4.6 SEM analysis .....	87

3.5 Questionnaire reliability and validity .....	88
3.5.1 DPR scale reliability and validity analysis .....	88
3.5.2 LMX scale reliability and validity analysis .....	92
3.5.3 OC scale reliability and validity analysis .....	94
3.5.4 TI scale reliability and validity analysis .....	95
3.6 Common method variances analysis .....	96
Chapter 4: Empirical Analysis and Hypothesis Test .....	99
4.1 Data description .....	99
4.1.1 Sample descriptive statistical analysis .....	99
4.1.2 Descriptive analysis of measured variables .....	101
4.2 Correlation analysis .....	101
4.3 Variance analysis of the effect of demographic factors on research variables .	103
4.3.1 Effect of demographic factors on research variables .....	103
4.3.2 Effects of different department classification on research variables .....	107
4.3.3 Effect of other demographic factors on research variables .....	109
4.3.4 Summary of significant difference regarding effect of demographic factors on research variables .....	109
4.4 SEM test and analysis of LMX-DPR-OC and TI .....	110
4.4.1 Partial mediating effect M1 .....	110
4.4.2 Completely mediating effect M2 .....	112
4.5 Summary of research hypotheses .....	115
Chapter 5: Research Results Analysis and Discussions .....	117
5.1 Current situation of doctors' LMX, DPR, OC, and TI .....	117
5.2 Analysis and discussion based on doctor-specific Chinese DPR scale .....	120
5.3 Discussions of hypotheses test results .....	121
5.3.1 Discussion of result of hypothesized relationship between LMX and DPR .....	121
5.3.2 Discussions of result of hypothesized relationship between LMX and OC .....	122
5.3.3 Discussions of result of hypothesized relationship between LMX and TI .....	122
5.3.4 Discussions of result of hypothesized relationship between DPR and OC .....	123
5.3.5 Discussions of result of hypothesized relationship between DPR and TI	123

5.3.6 Full mediating effect of DPR between LMX and OC .....	123
5.3.7 Partial mediating effect of DPR between LMX and TI.....	124
Chapter 6: Research Conclusions and Prospect .....	127
6.1 Research findings .....	127
6.1.1 Finding 1.....	127
6.1.2 Finding 2.....	127
6.1.3 Finding 3.....	128
6.2 Theoretical contribution .....	128
6.3 Managerial implications .....	129
6.4 Research limitations .....	131
6.5 Research prospect.....	132
Bibliography .....	135
Other References .....	159
Appendix I: Questionnaire .....	161
Appendix II: Figures & Tables .....	167

## List of Tables

Table 2-1 List of Szasz-Hoender DPR models.....	12
Table 2-2 List of DPR measurement scales.....	23
Table 2-3 Definitions of occupational commitment.....	41
Table 2-4 Main definitions of TI.....	57
Table 3-1 DPR scale.....	82
Table 3-2 Evaluation index for DPR model fitting degree.....	91
Table 3-3 Factor loading of DPR scale (factors rotated).....	91
Table 3-4 CITC and reliability analysis of formal DPR scale.....	92
Table 3-5 Evaluation index for LMX model fitting degree.....	93
Table 3-6 Evaluation index for OC model fitting degree.....	95
Table 3-7 Evaluation index for TI model fitting degree.....	96
Table 4-1 Sample descriptive statistical analysis.....	100
Table 4-2 Mean of main variables and correlation between variables.....	102
Table 4-3 Variance analysis regarding the effect of demographic factors on research variables .....	106
Table 4-4 Variance analysis concerning the effect of department classification on research variables.....	107
Table 4-5 Pairwise comparison results of LMX and DPR between doctors in different medical departments using LSD method.....	109
Table 4-6 Summary of significant variance analysis regarding effect of demographic factors on research variables.....	110
Table 4-7 Model fitting assessment-model M1.....	111
Table 4-8 Path coefficient estimation-model M1.....	112
Table 4-9 Model fitting assessment-model M2.....	113
Table 4-10 Comparison of fitting degree of M1 and M2.....	113
Table 4-11 Comparison of path coefficients between M1 and M2.....	114
Table 4-12 Standardized effect of SEM.....	115
Table 4-13 Summary of validation results of research hypotheses.....	115

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## List of Figures

Figure 2-1 Evolution timeline of doctor–patient relationship .....	10
Figure 2-2 Research model.....	78
Figure 3-1 The development process of the DPR scale .....	81
Figure 3-2 Data collection process .....	85
Figure 3-3 DPR constructs based on CFA.....	90
Figure 3-4 DPR constructs based on CFA (modified model).....	90
Figure 4-1 Partial mediating model M1 .....	111
Figure 4-2 Full mediating model M2 .....	113

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## List of Abbreviations

DPR	Doctor–patient relationship
OC	Occupational commitment
TI	Turnover intention
LMX	Leader-member exchange
POS	Perceived organizational support
AC	Affective commitment
CC	Continuance commitment
NC	Normative commitment
OCB	Organizational citizenship behavior
SEM	Structural Equation Model
COR	Conservation of resource theory
EFA	Exploratory factor analysis
CFA	Confirmatory factor analysis
KMO	Kaiser-Meyer-Olkin
LSD	Least-significant difference
MI	Modification index
X <sup>2</sup>	Chi-Square
DF	Degree of freedom
CMIN/DF	Chi-square-DOF ratio
RMSEA	Root mean square error of approximation
RMR	Root mean square residual
GFI	Goodness of fit index
AGFI	Adjust goodness of fit index
NFI	Normal fit index
CFI	Comparative fit index
IFI	Incremental fit index

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## **Chapter 1: Introduction**

### **1.1 Research background**

With the doctor–patient relationship (DPR) becoming increasingly intense, China’s DPR has been an area of high concern for the government and society since the new medical reform was introduced in 2009 (Lancet, 2014;Ma, Xu, Trigo, & Ramalho, 2017) and has also attracted worldwide attention (Pan et al., 2015). Based on a review of papers on China’s DPR published in key journals, Li and Zhang (2015)found that the number of such papers surged from around 40 in 1981 to 2000 in 2013. In general terms, there are several problems in China’s DPR, as described below.

First, medical disputes have occurred with increased frequency and have had an increasingly negative impact. Since 2002, the incidence of medical disputes in China has risen 22.9 percent every year; 98.4 percent of hospitals reported medical disputes; 73.5 percent of medical disputed affected the normal operation of hospitals; the compensation for medical disputes occurring in hospitals above the county-level amounted to 4.2 billion yuan, accounting for 5.9 percent of the total medical incomes (Xu, Wang, & Qi, 2016).

Second, the occurrence rate of violent incidents against doctors shows an upward trend year after year.A survey by the Chinese Hospital Association indicates that the percentage of medical staffers who were seriously injured as a result of body attacks increased from 47.7 percent in 2008 to 63.7 percent in 2012 (Jia et al., 2014).Even worse, the violent incidents against doctors or even violent attacks leading to deaths of doctors show no declining trend in recent years. According to the statistics of the Chinese Medical Doctor Association, between May 28 and June 7, 2015, nine violent incidents and even killing of doctors were reported in China and many medical staff were severely injured(Wang et al., 2016). This period was pitifully marked as the “Black June” by the medical industry. With the aid of well-developed internet and We-

Media, some reports on doctor–patient conflicts triggered mass incidents or even caused events undermining political stability(Xu et al., 2016).

Third, mutual mistrust between doctors and patients has intensified. On the one hand, patients are often on guard against doctors because they have lost confidence in their medical ethics and skills. For example, some patients recorded all their conversations with doctors as evidence in case of medical disputes in future. On the other hand, due to mistrust of the information patients provided about their conditions, the doctors tend to take defensive treatment measures, such as excessive medication and unnecessary examinations, to avoid the occurrence of medical disputes. Still, for fear of any miscommunication between doctors and patients, patients are required to sign a large number of informed consent forms (ICF). Medical staff in some hospitals even work wearing helmets or collectively learn martial arts for self-protection(Miao, 2015).

The DPR is formed when health delivery occurs between doctors and patients; this is essentially a continuously adjusted social relation that can reflect the social economic conditions and ideology and also change with them (Camanho, 2013). The currently tense DPR in China will undermine the efforts of the Chinese government to achieve the strategic goals of establishing harmonious society and Healthy China 2030,while also negatively affecting the patients' recovery of disease, clinical outcome, and satisfaction (Wang, Zhang, Wu, Zheng, & Lei, 2016). However, the causes of China's worrying and nervous DPR are complicated and manifold, including historical legacy, institutional and social problems. Chen and Zheng (2014) maintained that the tense DPR can be mainly attributed to the information asymmetry between the two parties, high dependence on medical equipments but less humanistic care, an obsolete hospital management system, and market-oriented health services. Other studies have also shown that the government factors, such as a flawed medical insurance system and uneven allocation of medical resources, have the greatest influence on DPR in China (Han & Zhong, 2015).Hu and Zhang (2015) believed that the strained DPR results directly from patients' unpleasant medical experience,including very long waiting times

and poor communication. Therefore, it is unrealistic to expect to completely relax the intense DPR overnight.

The tense DPR places immense pressure on medical staff, which affects their job burnout level and confidence in career development and turnover intention (TI) (Baker, Rd, Gray, & Love, 2003; Moreno-Jimenez, Galvez-Herrer, Rodriguez-Carvajal, & Sanz Vergel, 2012; Tan, Jia, Li, & Jiang, 2016). The current strained DPR also has an effect on doctors' occupational commitment (OC) (Qin et al., 2015; Zhang, 2015).

## **1.2 Research dilemma**

According to the 2016 National Health Statistics Yearbook (Statistical Information Center of the Ministry of Health, China, 2017), the number of doctors and nurses per 10,000 people in China is 22.2 and 23.7, respectively. By contrast, the corresponding numbers in the United States are 24.5 doctors and an unknown number of nurses, 28.1 and 88 in the United Kingdom, and 41 and 61.1 in Portugal (all excluding dentists). Thus, it can be seen that, compared with developed countries, the number of medical staff in China is still woefully inadequate. For example, in the proportion of medical staff in the UK, the current gap between doctors and nurses in China is 961.71 million, among which, 808,300 doctors are urgently needed, accounting for 26.5 percent of the total number of current doctors. When medical practitioners are in serious short supply in China, the Chinese medical staff should theoretically be highly valued and enjoy higher job satisfaction and professional pride. In most countries, doctors are held in high regard, enjoying higher social status and comfortable income. In many countries, talented people aspire to become a doctor regardless of the money and time it takes (Bai, 2011).

However, the job and occupational satisfaction of Chinese medical staff is low, meaning that China will suffer from a medical human resources crisis (Gu, 2012). There is inadequate medical talent in the medical market, and the high rate of medical staff turnover, low number of applicants for medical colleges and low OC of medical staff also contribute to the worsening condition. According to reports by Jie, Xing, and

Qi(2013), the number of applicants for medical colleges or universities is declining and even the career switch rate of graduating medical students is worryingly high. Over the past 5 years, 600,000 Chinese medical graduates have obtained the practicing certificate for doctors, but only one-sixth of those went on to register as medical practitioners. In the White Paper on Chinese Doctors' Practicing Situation, Liu (2015) noted that a 2014 survey indicates the percentage of Chinese doctors who expect or extremely expect their offspring to become doctors is less than one-sixth of the total; those with opposite wish account for three fifths (64.48 percent). Li et al.(2010) surveyed 933 medical staff in 29 public hospitals and found 49 percent of them have the TI. Huang and Yin (2014) found that the OC of Chinese doctors is at moderate level; only 22.6 percent show great passion for the profession and 43.8 percent are in a career slump. Given the chance to choose their profession again, 42.8 percent of doctors expressed they would not willing to work as a doctor; 48.8 percent of doctors think being a doctor in China is not a good profession. According to Liu (2016), 63 percent of doctors in tertiary hospitals have TI. Multiple studies suggest the TI of medical staff in China is high (Chang et al., 2016; Li et al., 2010). Thus it is not surprising that the job satisfaction of doctors is low and their TI is high.

The new round of health reform promoted by the Chinese government explicitly proposes to effectively mobilize the enthusiasm and initiatives of medical staff, which is also indispensable to the further development of health reform (The Central Committee of the Communist Party of China & State Council, 2009). "Effectively mobilize the initiatives of health care workers" has been mentioned four times in the document of Opinions of the CPC Central Committee and the State Council on Deepening the Health Care System Reform. The subsequently issued official documents such as Guiding Opinions on Strengthening the Performance Assessment of Health Workers in Public Health Institutions by the National Health and Family Commission, Ministry Of Human Resources Security, and Ministry Of Finance And Medicine(2015), Guiding Opinions on Comprehensive Reform Pilot in Urban Public Hospitals by the General Office of the State Council (2015a) and Outline for the National Health Services System (2015-2020) by the General Office of the State

Council (2015b) also require the establishment of a salary and incentive system suitable for the characteristics of health care industry. Efforts to mobilize the incentives of health workers have become political priorities. Hospitals are knowledge-intensive entities with large number of knowledge employees who can freely flow and have the ability of self-management and self-realization (Drucker, 2002). It is increasingly unlikely that such employees will work in a single organization for long time and will instead achieve their ultimate career goals in multiple organizations or departments (DeFillippi & Arthur, 1994). Strong passion for a profession is seen as one of the important values of knowledge employees. Therefore, in order to mobilize the initiatives of medical staff, more attention must be paid to their passion for their job as a doctor and their work attitude.

The OC is a psychological bond built up between employee and his or her occupation, reflecting the employee's strong sense of identification with and intense liking for that occupation (Zhang, 2015). TI represents the thoughts or intention of medical staff to leave an organization, which reflects their work attitude. In order to accelerate the liberation of the health human resources, efforts have included the implementation of a policy of multiple-site practice of certified practitioners, de-administration of public hospitals, reduction of budgeted posts in public hospitals, encouraging and guiding social capital to sponsor health care undertakings, as well as promotion of the hierarchical medical system. Against this backdrop, the health departments and hospitals should not focus solely on medical staff's organizational commitment and work attitude, and should instead pay more attention to their passion for the profession in order to work out more effective methods of mobilizing the enthusiasm of health workers. Therefore, against the Chinese culture background, the health workers' passion for profession, work attitude, and influence mechanism all need close attention.

A survey on the DPR and sublimity of medical profession among 512 patients and 497 medical staff by Chen, Yin, and Wei (2015) found that only 29.2 percent of medical staff believe the DPR is harmonious or relatively harmonious, while up to 53.9 percent of patients think so; 45.9 percent of medical staff think the medical profession is sublime

and 54.9 percent of patients hold the same view. This suggests DPR plays a crucial role in affecting doctors' work and occupational attitude in China's context.

Currently, while there are many qualitative studies on the relationship between doctors and patients in China, quantitative studies remain scarce, not to mention those from the perspective of medical staff(Yuan, 2015). Ma et al. (2017) contended that the DPR is affected by multiple factors and that it is therefore difficult to properly deal with DPR in an action. The hospital is the place where the DPR occurs and also one of the major shareholders of DPR, which has a significant effect on DPR. The present study attempts to help resolve the DPR problem from the organizational level of hospital. Leader–member exchange(LMX) refers to the social exchange relationship through which leaders treat their subordinates differently, which can affect doctors, DPR, or hospitals to varying degrees.

### **1.3 Research questions**

Based on the above discussion, the research questions are listed as below:

- (1) What are the connotations of DPR in China's context?
- (2) What is the current situation of China's DPR, OC level, and TI? Are there any differences regarding the demographic characteristics of doctors?
- (3) How does the LMX affect the DPR?
- (4) What effect does the DPR have on doctors' OC and TI?
- (5) How are the relationships between LMX, DPR, doctors' OC and TI?

### **1.4 Research objectives**

The study aims to explore the connotation of DPR in the Chinese cultural context from the perspective of doctors and understand the current situation of LMX, DPR, OC, and TI among doctors in China; how LMX affect doctors' DPR, OC, and TI; how DPR affects Chinese doctors' OC and TI; and how DPR affects LMX, OC, and TI. The research significance of these issues is explained below.

### **1.4.1 Theoretical significance**

The present study will enrich DPR theory. First, the DPR is variously defined by Chinese and foreign scholars and it is difficult to measure, especially as the effective doctor-specific DPR measurement scale is still absent. Second, most previous studies have focused solely on the current situation of DPR, causes, and response actions. For example, the antecedent variables of DPR have been studied by China's scholars mostly from such microscopic perspectives as system, policies, and law, but rarely from the micro perspective of organization, to say nothing of LMX-based studies on DPR. Third, although studies on outcome variables of DPR can still be found, most of them focus on the patients' treatment effect rather than medical staff's work pressure and job burnout. Also, the empirical studies on doctor's OC and TI are nearly absent. In order to fill in the academic gaps, the study aims to explore the relationship between DPR and OC and TI from the organizational perspective in China's context and construct effective measurement scale.

### **1.4.2 Management practice significance**

The current tension between doctors and patients has seriously affected the medical staff's work enthusiasm as well as their physical and mental health. However, the goals of Healthy China 2030 cannot be achieved without the health workers' active engagement and enthusiasm for work. By studying the effects of DPR on doctors' work attitudes and behaviors, this study will help hospital managers understand how harmful a tense DPR is and what its main causes are so that they can apply the knowledge of positive psychology from an organizational perspective and take targeted measures to improve the medical staff's awareness of DPR. Meanwhile, the managers can take effective measures from organizational perspective to improve doctors' OC and reduce TI. In addition, it can help the government to understand the effect of DPR on doctors' OC and TI, thus taking effective comprehensive measures to improve their awareness of DPR and OC and reduce TI, in a bid to establish harmonious DPR and achieve the goal of Healthy China 2030.

## **1.5 Thesis structure**

This thesis has six parts, including the introduction; as outlined below.

Chapter 1: Introduction. This chapter provides the research background, research difficulties, research objectives, and research problems.

Chapter 2: Literature review and theoretical framework. The chapter reviews DPR, LMX, OC, theories, constructs, and measurement, antecedents, and outcome variables regarding TI. It also describes the conservation of resources theory and social exchange theory in order to lay the theoretical foundation for this study, and proposes the research hypothesis and research model.

Chapter 3: Research methods. The questionnaire design and methods of data collection and statistical analysis are provided in detail. The sample data collected are analyzed using exploratory and confirmatory factor analysis methods in order to test the reliability and validity of the questionnaire. Finally, the questionnaire is finalized and common method variances analysis is conducted.

Chapter 4: Empirical analysis and hypothesis test. First, descriptive analysis is conducted for the collected data; secondly, correlation analysis and variance analysis are carried out; finally, the research hypothesis is verified using structural equation model for the theoretical model and the hypothesis test results are summarized.

Chapter 5: Research results analysis and discussion. The results based on empirical studies and previous research are compared, analyzed, and discussed.

Chapter 6: Research and prospect. First, the previous research is summarized. Second, the theoretical contributions of this study are given and its potential insights into management practice are discussed. Finally, the defects of this study are identified and the prospect of research direction in the future is given.

## **Chapter 2: Literature Review**

### **2.1 Doctor–patient Relationship**

#### **2.1.1 Concept definition of DPR**

The DPR is an important concept in health field (Ridd, Shaw, Lewis, & Salisbury, 2009). Kaba and Sooriakumaran (2007) pointed out that the DPR evolves with the medical conditions and social settings in different periods. Medical conditions include the self-reflections of two parties, communication abilities, and professional skills; the social settings refer to the social politics and scientific atmosphere during a certain period. The social settings and medical practice modes can be classified into five periods: (a) ancient Egypt, (b) Greek Enlightenment, (c) Medieval Europe and the Inquisition, (d) the French Revolution, and (e) DPR from the 18<sup>th</sup> century to the present. The characteristics of DPR in different periods are depicted in Figure 2-1.

Although the DPR has existed since ancient times, the term itself has not been universally defined (Eveleigh et al., 2012). Hall et al. (2002) argued that trust is the general rule of managing different types of relationships, which includes satisfaction, communication, abilities, and privacy. The second relevant concept is the therapeutic alliance or working alliance that is often used in psychological therapy; namely, emotional ties connecting a therapist with a client hoping to engage with each other (Fuertes et al., 2007). Bordin (1979) maintained that the good therapeutic alliance consists of three components: common goal, cooperation, and emotional bond connecting a therapist with a client, hoping to engage with each other. Third, the transference (or friendly affectionate feeling) is also theorized to be one of the important factors in therapeutic relationships. Based on meta-analysis, the concept of DPR was developed by Ridd et al. (2009), who believed the DPR should consist of four components from the patients' perspective – namely, knowledge, trust, loyalty, and

regard – each of which should be reflected in the interaction between doctors and patients during treatment.

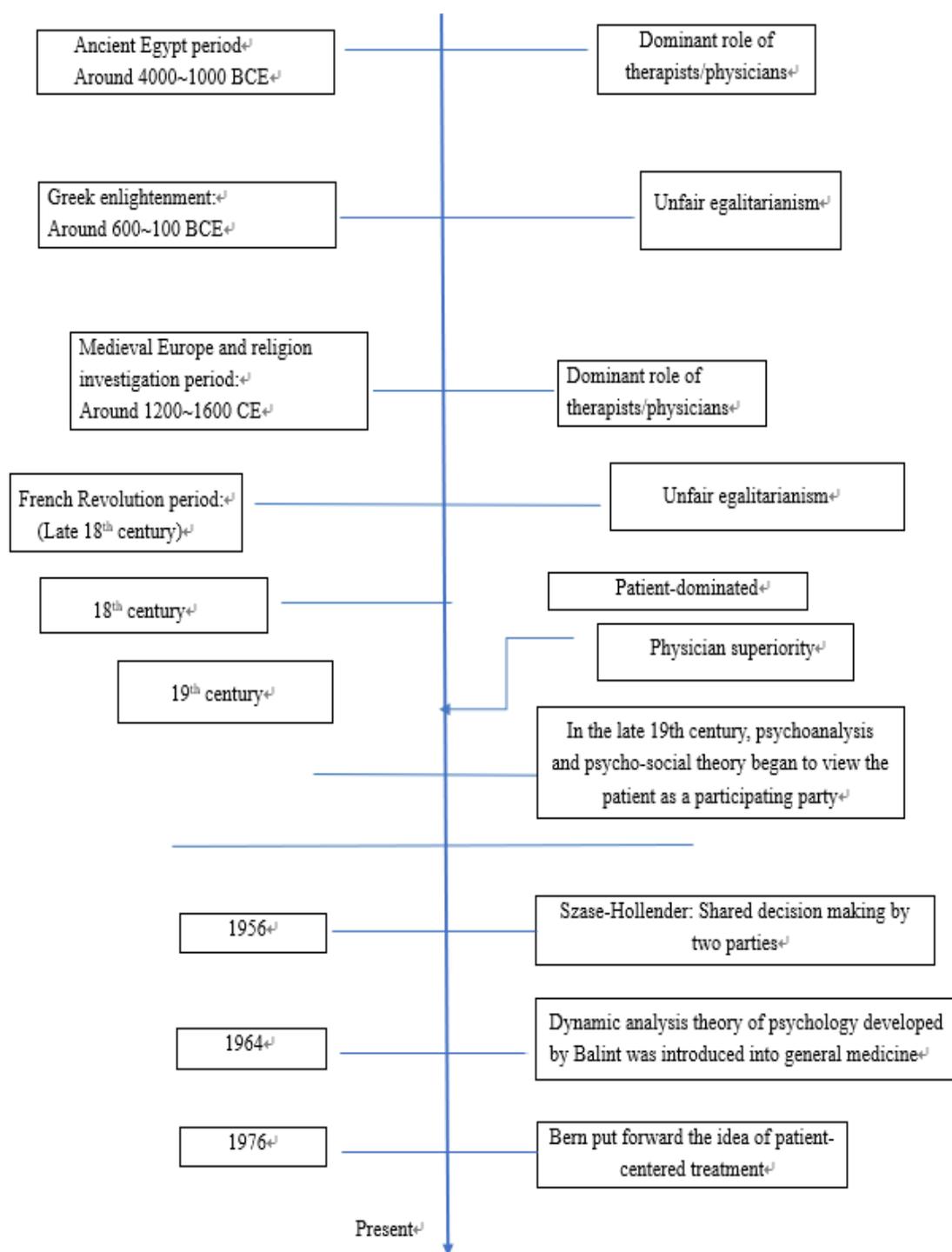


Figure 2-1 Evolution timeline of doctor–patient relationship

Source: Kaba and Sooriakumaran (2007)

Camanho (2013) argued that DPR is essentially a continuously adjusted social relationship that can reflect the social economic conditions and ideology and meanwhile change with them. Therefore, with the social progress, the medical modes are evolving. Generally, the concept of DPR can be interpreted in narrow and broad senses. In the broad sense, the two parties refer to the health workers and patients and their family members; in the narrow sense, the two parties include only a patient and his/her therapist (s) (Fu, Xiao, & Tang, 2010). The DPR is essentially a special interpersonal relationship and the doctors and patients are core stakeholders. Therefore, the DPR in this study is defined as the relationship between doctors and patients and their family members.

According to the severity of disease conditions, Szasz and Hollender (1956) classified the DPR into three models, as shown in Table 2-1. These models are explained below.

1. Doctor superiority model. This model resembles the parent–infant relationship. During treatment, the doctor makes a patient’s health decisions without inviting the patient’s input into the decision-making process, so there is no interaction between the two parties. For example, for a critically ill patient in need of emergency treatment, asking for the patient’s consent or including a patient’s decision into treatment would delay the treatment, thus endangering the patient’s health. In such a relationship, the doctor is put in a position of omniscience and omnipotence over the patient (Ridd et al., 2009).

2. Instruction–cooperation mode. When the health issues are not in need of urgent treatment, the doctor plays a guiding role and the patient is required to cooperate with the treatment and unconditionally follow the doctor’s instructions. During treatment, patients who may be experiencing anxiety and pain are willing to cooperate with the doctors. In this model, the doctors are viewed as superior to the patient.

3. Shared decision making. In this model, the treatment options are left open because the doctors believe the doctor–patient interaction should be based on equality

of rights, mutual independence, and joint satisfaction in order to establish a good therapeutic alliance and foster patients’ ability of self-management. The typical case is the management of chronic diseases. In this mode, the patients have a high sense of responsibility and empathy and are more willing to form a working alliance with doctors. Patients have the right to provide informed consent and choose from among many treatment options according to their own treatment goals and wishes. The satisfaction of doctors comes not from the idea of “the doctor knows the best” or their authoritarian control over the patients, but from their professional services (Hellin, 2002).

Table 2-1 List of Szasz-Hoender DPR models

Model	Role of medical staff	Role of patients	Clinical conditions	Prototype of models
Doctor superiority	Without asking for the patient’s consent before treatment	Passively accept treatment(no opportunity to disagree or no use in disagreeing)	Seriously injured, coma, shock	parent–infants
Instruction–cooperation	Help guide treatment	Cooperate with treatment (compliance)	Acute infection	Parent–child
Shared decisionmaking	Foster patients’ ability of self-management	Form therapeutic relationship with doctors	Chronic diseases	Adult–adult

Source:Szasz and Hollender (1956)

## 2.1.2 China’s strained DPR

### 2.1.2.1 Current situation of China’s DPR

The DPR in China is poor and medical staff work in tense and risky conditions(Pan et al., 2015). The findings of a survey on DPR conducted by Wen et al. (2015)in 2013 across nine provinces in China since the medical reform in 2009 suggests DPR is far from satisfactory. Three-quarters of respondents in that survey felt that China’s DPR is strained; only 3.6 percent think the DPR is harmonious. The number of violent incidents

against doctors and medical disputes continues to increase, indicating that a new round of medical reform has failed to significantly improve DPR in China (Wang, Zhang, & Xu, 2014; Wang et al., 2016). The tense DPR has become the biggest obstacle hampering the development of Chinese hospitals (Xu & Zhang, 2017).

Doctor–patient trust is the cornerstone of harmonious DPR (Chen et al., 2015). Medical staff have not received due respect and the trust crisis between doctors and patients has become a prominent problem (Wang & Wang, 2016). According to Liu (2012), the declining trust among Chinese people, poor doctor–patient communication, and problems of the medical system have caused deep mistrust between doctors and patients. Zuo (2015) argued that, affected by the news reports of poor DPR, patients tend to show low trust in doctors and remain on guard when communicating with doctors. Without sufficient legal and medical knowledge, once the treatment results are not as satisfactory as expected, patients are angered and believe the doctors should be blamed for such medical failures. In extreme cases, medical violence against doctors frequently occurs. In 2013, China conducted its fifth National Health Service survey, which found that the proportion of patients who trusted their doctors had decreased by 22.1 percent compared to the previous survey, five years earlier, while their mistrust rate had increased by 6.8 percent (Wang et al., 2014)

#### **2.1.2.2 Main reasons behind the tense China’s DPR**

DPR not only refers narrowly to the relationship between patients and doctors and hospitals, but also broadly reflects the relationship between politics, economy, culture, and the medical system as a whole in a country or region (Chen & Zheng, 2014). Therefore, China’s DPR is closely related to the economic, cultural, and social background of China, which is still in a transitional period.

The medical reform in China that has occurred from 1980 to the present is closely related to the development of DPR. Zhu (2016) argued that China’s medical system reform has experienced three stages since the reform and opening up policies were implemented in the 1980s. In the first stage (1985–1999), the medical reform aimed to

ease fiscal pressure and establish effective fund-raising and restraint mechanisms. The main measures included “improve compensation mechanism for health institutions based on more policies but less government investment” and “gradually transform public health care and labor insurance into medical insurance for urban workers” (Zhu, 2016). In the second stage (2000–2008), the purpose of medical reform was mainly to curb the rising patients’ medical expenses and solve the problems of uneven distribution of medical resources and lack of effective operation mechanism in public hospitals. Although the goals of medical insurance system reform, classification management of “for-profit” and “non-profit” medical institutions and drug distribution system reform had been fully realized, the reform in this stage was thought to be basically unsuccessful, with patients, hospitals, and government all being unsatisfied with the results (Guo, Zhang, Wu, Luo, & Dai, 2008). The SARS event in 2003 fully exposed the defects of China’s medical system. After extensive preparations, the comprehensive medical reform in 2009 was initiated (Ma et al., 2017). The reform in the third stage (2009–present) has focused on the efforts to quicken the establishment of a medical insurance system, initially establish the basic drug system, improve the basic medical service system, promote the equalization of basic public services, and push forward the pilot reforms in public hospitals. However, the reform in this stage has led to the fragmentation of the medical insurance system, the unpopularity of grassroots hospitals, and the flooding of patients into public hospitals, which has worsened the situation of “difficult and costly access to health care services” and further intensified tension between doctors and patients.

The causes of the contradiction between doctors and patients in China are mainly divided into the following four aspects.

The first is the marketization of health care and insufficient financial support from government result in the difficult DPR. The inadequate medical system contributes most to the tense DPR in China (Zuo, 2015). Since the reform and opening up in late 1970s, the socialist market economy has been implemented in a planned way, and that comes

with a comprehensive transformation of China's medical system. The most obvious facts are that the totally free medical services have been gradually phased out and the financial support from government has been sharply reduced. The result is that the public hospitals have to be self-financing in order to cover their operating costs and most public hospitals care solely for profits. Meanwhile, although China's total health expenditure as a percentage of GDP rose from 4.1 percent to 5.57 percent between 1991 and 2013(Qiu & Sun, 2016), it is still well below the world's average level (8.7 percent). Financial support from government accounts for only 12.6 percent of total health expenditure, while the proportion of personal health spending is as high as 44.2 percent(Ye, Zhang, Shi, & Liang, 2016). When total health expenditure jumped from 11.021 billion yuan before the reform and opening up to 2.811 trillion yuan, the per capita medical costs increased remarkably from 11.45 yuan in 1978 to 2076.67 yuan in 2012 (Wen, Du, Li, & Lu, 2016). This shows that government investment is insufficient and that patients are overburdened with excessively high medical expenses.

The surging total health expenditure, heavy individual economic burden and expensive medical costs are the main causes of the difficult DPR. Therefore, the marketization of health care and insufficient government investment has financially pitted doctors against patients (Zuo, 2015), which is the underlying cause of deteriorating DPR.

Second, profits-oriented medical practices by hospitals and medical staff have given rise to the tense DPR. China's hospitals, especially public hospitals, are still subordinate to the health administrative department and the problems such as bureaucracy and ossified system in medical institutions still exist (Fu et al., 2010), while industry self-regulation and supervision levels are low. Other challenges include low professionalism of hospital presidents, low quality of management personnel, and poor service consciousness of medical staff in public hospitals. Under the market-oriented and commercialized system, the medical charges are not reasonable. The income of medical staff comes mainly from the physical examinations and laboratory tests and the

fees of treatment and surgery are still very low (Lin, Li, & Zhang, 2015). In order to achieve profit targets and pursue personal gains, some bad medical practices such as drug rebates and kickbacks for unnecessary physical examinations have become widespread in public hospitals. With the traditional concept of “practicing medicine is doing good” taking root in doctors’ minds, hospital managers and health professionals have little empathy for patients seeking medical treatment; the ratio of doctors to patients in China is extremely low, while medical staff have heavy workloads and work under high pressure. Sang (2013) reported that the average diagnosis time of some doctors is less than three minutes, the short diagnosis time and poor communication skills of some doctors have negatively affected the patients’ medical experience and full doctor–patient communication. When patients lose their lives despite spending large sums of money or the conditions continue to worsen after treatment, their family members blame the treatment failure or deterioration of patients’ health on doctors and mistakenly think they have been cheated. In many cases, the emotionally charged patients and family members attempt to solve the medical disputes by disrupting the medical order of hospitals, or, in extreme cases, even kill doctors, which worsens the DPR (Hu & Zhang, 2015).

Third, the inadequate legal system also sours the DPR. Yang (2012) claimed that the public’s legal awareness and consciousness of rights safeguarding has been greatly enhanced. However, China’s inadequate legal system makes it difficult for patients and medical staff to defend their own rights and interests; for example, high costs of medical disputes lawsuits, complex judicial proceedings, lack of authoritative laws on identification and handling of medical accidents, and ambiguous guidelines of identification of medical responsibilities resulting from medical disputes (Liu, 2015), as well as an inadequate healthcare legal security system (Fu et al., 2010). When medical disputes occur, most patients are not willing to resort to law and instead attempt to resolve the disputes by disturbing the medical order of hospitals or directly attacking the doctors (this is known as “*yinao*” in Chinese). *Yi nao* refers to the organized

disturbance of normal activities of hospitals or assaults on medical staff, usually aiming to obtain compensation for actual or perceived medical malpractice, which undoubtedly adds pressure to an already tense DPR.

Fourth, the Chinese media plays a negative role in affecting DPR. In the information era, the Chinese media certainly plays an important role in harmonizing the DPR. Yang (2012) found that reports on medical incidents by Chinese media are unprofessional, one-sided, and superficial because most of them focus solely on the superficial phenomenon of tense DPR while failing to analyze its causes. In order to catch attention, the media often exaggerates the facts or falsely reports a story based only on patients' accounts in order to show sympathy for them. Some reports even intentionally highlight the claim issues regardless of what the facts really are (Fu et al., 2010). In order to cause a sensation, some reports even describe the patients and doctors as warring parties. For example, some doctors are reported to have accepted red envelopes (a monetary gift in exchange for favorable services), required unnecessary physical examinations, and prescribe exorbitant prices for medicine. Separately, some reports have improperly played up how to gain high compensation through *yinao* or offered biased opinions to condemn doctors and hospitals before revealing the truth. The sympathy for patients and biases against doctors has inadvertently fomented the aggressive behaviors of some provocative trouble-making patients, leading to other patients mistakenly believing that the more troubles one makes, the higher the compensation he/she will get in the event of medical disputes. The physical and psychological harm has severely dampened the enthusiasm of health workers and worsened the DPR.

### **2.1.3 DPR-related stakeholders**

DPR represents a complicated relationship involving multiple parties. According to the stakeholder theory, the primary stakeholders in the DPR include patients and their families, medical employees, hospitals, government, suppliers of medical equipments

and drugs, the public, and the media. Huang and Cheng (2015) argued that the stakeholders in question can be categorized into three types:(1) core stakeholders, including medical employees, patients, and hospitals; (2) closelyknit stakeholders, including government and pharmaceutical enterprises; and (3) latent stakeholders, including the public and media. The three types of stakeholders have different effects on DPR. The present study focuses on the two-way influence between doctors (patients) and DPR.

### **2.1.3.1 Interaction between patients and DPR**

Patients are the starting point of DPR. The feelings and behaviors of patients while visiting doctors can directly affect DPR. The doctors are not always omniscient and omnipotent and their medical knowledge is not sufficient to cure all diseases. Jing and Jing (2014) argued that because of lack of medical knowledge, patients always place high expectations on treatment outcomes. Meanwhile, with medical resources being unevenly distributed across China, patients tend to flood into large hospitals despite having bad medical experiences, such as extremely long wait times, low service quality, and poor doctor–patient communication. In addition, the medical insurance system is flawed, government investment is insufficient, and patients are burdened with high medical fees. When patients have died, He (2014) thinks that because of a lack of trust in doctors, patients are always on guard against them, which leads to increasing tensions between doctors and patients.

Patients are the also primary beneficiaries of good DPR. The quality of DPR depends largely on the patients' satisfaction level and treatment outcomes. Di, Harkness, Ernst, Georgiou, and Kleijnen (2001) showed that the DPR has a great impact on patients' physical and mental health. Thom, Bloch, and Segal (1999) argued that good mutual trust between doctors and patients can improve patients' treatment compliance and enhance their ability to adapt themselves to the agonizing pains and possible unsatisfactory treatment outcome, thus improving treatment effect and reducing costs. Mohr and Spekman (1994) and Mohseni and Lindstrom (2007) claimed

that good DPR can help patients understand their health conditions and actively improve their physical and mental health. Shen (2010) considers the active patients' engagement can improve DPR and affect treatment effects. Meanwhile, good DPR can reduce the patients' likelihood of using violent means to resolve doctor–patient conflicts and improve patient satisfaction (Eveleigh et al., 2012).

### **2.1.3.2 The interaction between medical staff and DPR**

The medical staff's capability, stress, and motivation can exert influence on DPR. The capability refers to the potential ability of a person to successfully complete a task, which can directly affect work efficiency. Stress refers to a worried or nervous feeling that stops a person from relaxing; it can be caused, for example, by a sudden event or special environment. Motivation refers to the act of giving someone a reason or incentive to achieve goals. In terms of the effect of capability on DPR, Duan, Qiu, Yu, and Hu (2014) found that the quality of diagnosis and examinations of doctors affects patients' satisfaction and trust. Pan et al. (2015) found that 51 percent of violent incidents against doctors are caused by patients' dissatisfaction with diagnosis and treatment results. Ma, Sun, and Zhu (2012) discovered that patients' trust level in doctors in China is largely determined by the doctors' capabilities and some medical malpractices and disputes are mainly caused by doctors' misdiagnosis. Therefore, good DPR depends heavily on doctors' medical skills (Dong & Tao, 2005). Xie, Wang, and He (2015) found that the doctor–patient trust level is related to the doctors' communication capabilities. Wang et al. (2016) pointed out that the doctors' poor communication is a significant cause of difficult DPR. Fu et al. (2010) found the poor doctor–patient communication is one of the main causes of the tense DPR, which shows that China's DPR is closely linked with doctors' communication capabilities and medical skills (Hu & Zhang, 2015; Wang et al., 2016).

In terms of the effects of doctors' stress and motivation on DPR, a survey on work stress, job burnout and health conditions among 2784 medical staff in Changsha in Hunan province by Yao (2014) found that only 20.89 percent of nursing staff feel they

are in good health; over half of medical staff fail to take part in any physical exercise each week; 80.86 percent have to work over eight hours each day; and up to 90 percent of medical staff feel tired or extremely exhausted after work. Xu (2014) drew the similar conclusion that the doctors are under great pressure in organizational management, career development, and workload. Ma and Zhu (2015) found that, because of high workload and long-term work pressure, most nursing staff have suffered nervous breakdowns. During doctor–patient communication, if doctors cannot control their emotions properly or explain their patients' conditions clearly, the patients might get angry at the doctors' work attitude, thus affecting the DPR.

In terms of the motivation of medical staff, the income structure of medical staff is not reasonable. Most of their incomes come from the physical examinations and laboratory tests. The lower fees of diagnosis and surgery cannot reflect the medical staff's value (Lin et al., 2015). Meanwhile, the performance assessment system in most public hospitals has become a mere formality. The salary and welfare treatment are closely linked with professional title and administrative position rather than work quality and amount of work. The distribution system, which lacks an effective incentive mechanism, cannot fully mobilize the initiatives of medical staff (Gao, 2014). Meanwhile, due to the insufficient number of health workers in China, medical staffers have been long overworked and stressed to the point of exhaustion. The relatively low income relative to their hard work has also lowered the morale of medical staff (Wang et al., 2016), which affects the doctors' work sentiment and further deteriorates medical service quality and the lack of humanistic care. Li (2013) maintained that the tense DPR has led China's doctors to act over-cautiously and take defensive treatment to avoid medical malpractice. Meanwhile, the hospitals have received very limited financial support from government, meaning that they must generate income to cover operating costs. By putting profit-making first, some hospitals and medical staff impose unnecessary examinations and treatment programs (Huang & Cheng, 2015), which puts excessive psychological and economic burdens on patients,

resulting in the tense DPR.

On the other hand, the DPR affects the attitudes and behaviors of medical staff. He (2014) believed the tense DPR in China leads to overly defensive treatment by doctors and even a disregard for medical ethics.

In terms of job burnout, Wallace and Lemaire (2007) insisted that the DPR is the source of pressure and satisfaction in daily work. A tense DPR will bring work pressure to medical staff and affect their work enthusiasm, thus generating job burnout (Moreno-Jimenez et al., 2012). Empirical study found that DPR is a good predictor of psychological capital and job burnout, tense DPR can increase doctors' job burnout, while psychological capital can reduce the positive effect of DPR on OC (Wang, 2015).

In terms of TI, a difficult DPR can significantly and positively affect the medical staff's TI (Dong, Ariana, & Xiao, 2013). A positive DPR is significantly and positively correlated with job satisfaction and negatively related to TI, with job satisfaction playing intermediary role between DPR and TI (Mo, Xu, Luo, & Gai, 2015).

In terms of work engagement, tense DPR is negatively correlated with work engagement (Chu, 2013). The work meaning, psychological safety, and psychological availability are positively correlated with work engagement (Kahn, 1990) because sound DPR makes medical staff psychologically safe, which makes them more likely to devote themselves to their work. A positive DPR is positively correlated with work engagement (Meng et al., 2014).

Dong and Proochista (2012) argued that the effect of DPR on doctors' work mood and attitudes has become a common concern in China and other countries. The job satisfaction of doctors is highly related to the respect and trust of patients (Grebowski et al., 2005). With a crucial role in the DPR, the work mood and attitude of doctors has a crucial bearing on the success of China's new medical reform. The correlation between DPR and medical staff's work pressure, job burnout, job satisfaction, and TI has been extensively studied. DPR is mostly studied as an outcome variable, and rarely as an antecedent variable.

#### 2.1.4 Measurement of DPR

Apart from questionnaires, various scholars have also constructed 19DPR measurement scales, as reviewed by Eveleigh et al. (2012) and mainly shown in Table 2-2. Eight of these DPR scales are used for mental health, nine for primary care or general health care, and two for specialist care.

The DPR scales measure the DPR from the perspectives of patient, doctor, and observer, respectively, or even from a comprehensive angle of the three parties combined. Among the 19 DPR scales reviewed by Eveleigh, only VTAS and RCOS-O are observer-based and the Difficult Doctor–Patient Relationship Questionnaire (DDPRQ-10) is doctor-based. Most scales are patient-based.

The doctor-based Difficult Doctor–patient Relationship Questionnaire (DDPRQ-30) developed by Hahn, Thompson, Wills, Stern, and Budner (1994) involves five dimensions: demanding irritating patient (14 items), doctor dysphasia (nine items), compliance communication (four items), self-destructive patient (two items), and seductive patient (one item). Based on Hahn’s DDPRQ-30, the simplified DDPRQ-10 was designed in 1996 and includes three dimensions: Doctor subjective experience (five items), quasi-objective questions about the patient’s behavior (four items), and symptoms combine elements of the patient’s behavior and of the doctor’s subjective response (one item). It uses a typical six-level Likert scale; the lower the score, the worse the doctor–patient relationship (Hahn et al., 1996). The scale was successively used by Chinese scholars (Chen, 2012; Chu, 2013; Wang, 2015). A defect of the scale is that its items are not easy to understand. Based on DDPRQ-10, Yang (2011) designed a DPR scale that suits China’s conditions. However, the fitting degree of the confirmatory factor analysis model is not satisfactory. The main reason for this is that the items are weakly correlated and the percentage of correlation coefficients greater than 0.2 among 10 items is less than 50 percent.

Table 2-2 List of DPR measurement scales

No.	Purpose	Types of DPR scales	Perspective of research
1	Used as DPR measurement in mental health or psychological therapy	1. Working Alliance Inventory, Simplified Revised Version (abbreviated as WAI-SR) 2. California Psychotherapy Alliance Scales (CALPAS) 3. Agnew Relationship Measure (ARM) 4. Vanderbilt Therapeutic Alliance Scale (VTAS)	VTAS is observer-based and the rest are patient-based
2	Primary health care or general care	1. Kim Alliance Scale (KAS) 2. Kim Alliance Scale, Stanford Trust in Doctor scale (STP) 3. Helping Alliance questionnaire-Revised (HAq-R) 4. Patient–doctor relationship questionnaire 5. Patient–Doctor Relationship Questionnaire (PDRQ-9) 6. Wake Forest (Doctor) Trust Scale (WFT) 7. Health Care Relationship (HCR) 8. Consultation and Relational Empathy (CARE) 9. Difficult Doctor–Patient Relationship Questionnaire (DDPRQ-10)	DDPRQ-10 is doctor-based, others are patient-based
3	Specialist care	1. Human Connection scale (mainly used for dying cancer patients) 2. Dual-Role Relationships Inventory, revised version (DRI-R) (used in community health centers)	Patient-based

Source: Eveleigh et al. (2012)

Van der Feltz-Cornelis, Van Oppen, Van Marwijk, De Beurs, and Van Dyck (2004) developed a simple patient-based PDRQ-15 scale, which also has three dimensions: patients' satisfaction with doctors (six items), doctors' amiability (seven items), and patient's attitude towards his/her disease (two items). A five-point Likert item format is used in this scale. PDRQ-15 has been currently translated into different language versions and widely used. Chinese scholars Yang and Wang (2011) transformed PDRQ-15 into PDRQ-13 for use in a Chinese context. After analyzing the reliability and validity of PDRQ-15, the two scholars deleted the 14<sup>th</sup> and 15<sup>th</sup> items from the original scale in order to achieve good results when it is applied. By using PDRQ-15 to survey medical staff in Deyang city in China, Yuan (2015) found that low patient satisfaction is mainly caused by inadequate doctor–patient communication

and patient’s slow psychological recovery because of insufficient knowledge of his/her condition.

American scholars Krupat al. (2000) developed a PPOS scale from perspectives of patients and doctors, which includes two dimensions – namely sharing and caring– with 18 items. It represents the perception towards DPR in modern medical model (Xue et al., 2018).

By comparing differnt DPR scales,Xue et al. (2018)found the constructs of DPR scales mainly include patient–doctor trust, patient–doctor communication, doctor’s experience, and behaviors. Most scales survive the test of validity and reliability and thus perform well in stability and reliability. The DPR scales used in China are classified into two types: one measures DPR in China and is based on qualitative research or self-made questionnaire (Chen & Zheng, 2014); the other is translated from foreign scales, such as the DPR scale developed by Yang based on PDRQ-15 or DDPQRQ-10 according to the Chinese context (Chen, 2012;Chu, 2013;Wang, 2015;Yang & Wang, 2011). Because China’s medical system and social culture differ vastly from those in foreign countries, the translated DPR scales cannot reflect the DPR condition in China and the reliability and validity of these kinds of scales remain to be tested. However,the measurement standards are not unified and the reliability and validity of questionnaires remain to be tested. The DPR can be measured in multiple ways and the measurement contents are varied(Sun et al., 2016).Further,research on DPR measurement from the doctors’ perspective is scarce.Therefore,it is necessary to develop DPR scales that suit China’s actual conditions (Ma et al., 2017).

### **2.1.5 Research review**

The DPR is closely associated with socio-economic conditions and political system and has therefore attracted wide attention around the world. The concept, measurement, and causes of DPR have been profoundly studied by scholars and a new breakthrough has been made in the study of interaction between DPR and

doctors/patients. While DPR has become a hot topic among Chinese scholars, those studies focus more on the current situation of DPR and how to prevent difficult DPR, while research on the effect that DPR has on medical staff needs to be strengthened.

The DPR scales used by China's scholars follow different standards and the reliability and validity of questionnaires remains to be tested. Therefore, there are still no effective China-specific DPR scales. Besides, antecedent variables of DPR are studied by Chinese scholars mostly from such microscopic perspectives as system, policies, and law, and rarely from the micro-perspective of the organization, to say nothing of LMX-based studies on DPR. Although some studies have focused on the outcome variables of DPR, most of them concern the treatment outcome of patients and only a few have discussed the effect of DPR on job pressure and job burnout of medical staff. Research into the effect of DPR on professional attitude and work attitude is rare, while empirical studies on the effect of DPR on doctors' OC and TI are even rarer.

## **2.2 Leader–member exchange**

### **2.2.1 LMX**

Leadership effectiveness is a core issue of organizational behavior and has been studied extensively. Studies of leadership effectiveness have mainly been conducted from two perspectives: leader-focused and LMX (Wang & Zhu, 2006). Earlier studies have mostly been leader-focused by exploring and examining leaders' personal traits, special behaviors, interactions with individuals and groups, and the impact of leadership behaviors on organizational performance. The leader-focused perspective makes an important assumption that the leaders behaved in the same fashion with all their subordinates. However, Graen, Jr, and Minami (1972) challenged this idea, arguing that if leaders treat all followers in the same way, it will be difficult to explain why some subordinates are treated favorably by leaders, in areas such as more work autonomy, flexibility and promotion opportunities. On these grounds, the authors claimed that the

leadership research should focus on the leader and member relationship, and put forward the concept of LMX, which suggests that leaders tend to form differentiated relationships with those who reported to them and take different management measures.

Western theorists believe that LMX refers to the economic and social exchanges between leaders and subordinates. Due to limited time and social resources, leaders will not give their all followers equal attention. Instead, they sort team members (often subconsciously) into two groups – the in-group and the out-group – according to the closeness of relationship, and treat them differently. The in-group members get more attention, trust, and respect from leaders and therefore feel highly motivated and maintain the good opinion of their managers. The in-group members and leaders form a solid exchange relationship based on “trust, gratitude and obligations” (Ren & Wang, 2005). By contrast, members of out-group do not receive any additional attention and have less access to the managers. With less support and motivation, the out-group forms a low-quality task-oriented relationship with leaders on a contractual basis.

After more than 40 years of development, LMX theory has integrated numerous theoretical achievements and empirical studies and has become a frontier theory and hotly-researched topic in leadership research and management psychology (Ren, Wang, & Lu, 2017).

LMX studies focus on the trust and obligation between leaders and subordinates, the effect of followers’ behaviors and attitudes on performance, and what relationship should be established between leaders and members in order to maintain leadership effectiveness (Graen & Uhl-Bien, 1995). LMX was proposed based on this kind of studies of leader member relationship emphasizing the interactions between leaders and subordinates. LMX was initially interpreted by scholars based on role-playing theory, according to which new employees generally go through three stages in the process of work socialization in an organization, including role taking, role making, and role routinization. Role-taking occurs when team members first join the group. Managers use this time to assess new members’ skills and abilities. In the second stage,

new team members are assigned some loosely-organized tasks that are linked to leaders' work. During this last phase, if team members prove themselves loyal, trustworthy, and skilled, a stable relationship between team members and their managers is established (Ren & Wang, 2005; Wang & Zhu, 2006).

However, in the socialization of an organization, the subordinates are not simply passive role-takers. When new tasks are assigned, they might reject or conditionally receive the assignment or even renegotiate with leaders, whereby various resources are exchanged between two parties. The role negotiation behaviors largely determine the quality and maturity of LMX and result in the differentiated relationships between leaders and subordinates, known as in-group and out-group. In the second stage, if new team members can work hard, be loyal, and prove trustworthy, high-quality LMX will be established and they are put into the in-group. On the contrary, if team members betray the trust of the manager, or show that they are unmotivated or incompetent, low-quality LMX is formed and these team members are put into the out-group (Graen & Scandura, 1987; Graen & Uhl-Bien, 1995).

### **2.2.2 Development of LMX**

Graen and Uhl-Bien (1995) used four stages to explain how LMX theory had evolved over time. During the first stage, the theory primarily involved work socialization and vertical dyad linkage, with a focus on the analysis of dyads; that is, in-groups and out-groups. The members in the inner circle are given more trust and benefits, while the out-group members only try to work enough to fulfill their contractual obligations. This indicates that leaders do not treat their followers the same, which is different from the view of traditional leadership balanced model. In the second stage, LMX studies focus on the establishment and improvement of the LMX relationship and different LMX lead to various outcomes. The focus of LMX studies in the third stage shifts from the differentiated LMX relationship to how leaders should establish one-to-one cooperation with followers. In the fourth stage, LMX moved

beyond the dyad level and discussed the LM relationship at the system-level; that is, at inter-group and network levels.

### 2.2.3 LMX structure and measurement

Scandura (1999) reviewed 147 LMX-related papers published between 1972 and 1998 and found the exchanges mentioned in the LMX-based papers in 1970s mainly included capability, trust, support, reward, and satisfaction with leaders. A review of 82 papers published in the 1990s suggests most scholars reached consensus in LMX quality, yet there is little consensus on the LMX definition and exchange contents (Scandura, 1999). Most studies indicated that there are six elements that are exchanged in LMX relationship: mutual trust, mutual support, emotion, role freedom, leaders' attention, and loyalty.

Thus, it can be seen that from the 1970s to the 1990s, the LMX was defined by different scholars in different ways, and no consensus was reached on exchange contents, which largely contributed to the ambiguity of LMX structure. The situation is much the same in the 1990s. There is still no consensus on whether LMX is single dimension or multiple dimensions. Graen and Scandura (1987); Graen and Uhl-Bien (1995) argued if there are only work-related interactions between leaders and followers, then LMX should be one-dimensional. However, it is hard to ensure that leaders and subordinates only interact in working situations. The process of role-taking comes with the establishment of the LMX relationship. Role multidimensionality is just what is emphasized in role theory.

Earlier studies viewed LMX as a single dimension and used it to assess LMX quality. Dienesch and Liden (1986) argued LMX is multi-dimensional, including emotion, contribution, and loyalty. Based on this theory, Liden and Maslyn (1998) extended the three-dimensional LMX to a four-dimensional one by adding professional respect. The definitions of four dimensions are as follows.

- (1) Contribution: The direction, quantity, and quality of leaders and subordinates'

efforts for the realization of a common goal.

(2) Loyalty: Leaders and subordinates express public support for each other's personal qualities and goals.

(3) Affect: Emotion refers to a strong and stable emotional ties formed between leaders and subordinates due to mutual affinity, which is not directly linked to the work and professional skills.

(4) Professional respect: Leaders and subordinates are both clearly aware of each other's reputation in a professional field. The qualifications for work are among the determining factors of LMX relationship quality. Therefore, the professional skills and qualities of the two parties have a great effect on the LMX relationship.

Based on the foreign LMX structure, Wang et al, (2004) conducted single- and four-dimensional LMX studies. Based on *guanxi* (known as connections in the Chinese context and foreign LMX research), Law, Wong, Wang, and Wang (2000) proposed indigenized supervisor subordinate *guanxi* (SSG) and defined it as a non-working exchange relationship through family visit and social activities.

Indigenization of LMX studies by Chinese scholars Ren et al. (2010, 2014) and Wang (2014) proposed the LMX outcome and measurement methods, according to which the LMX relationship refers to a superiority-subordinate relationship established based on working scenarios, with a focus on leader–member quality rather than exchange quality. The LMX relationship centers on the working relationship and gradually extends to non-working relationship, with a structure of dual perspectives and four dimensions including mutual care and support, creation of inner circle, loyalty, and contribution, and disobedience. The active relationships include care and support, and loyalty and contribution; the negative relationships involve the creation of an inner circle and contradiction. Meanwhile, there are huge differences between Western and Chinese scholars in terms of understanding the LMX dimensions. For example, the emotional dimension of LMX refers to an emotional experience of mutual affinity between leaders and followers in Western countries, while in China it represents the

leaders' care and support for subordinates and the latter's empathy for and favor with the former. The two dimensions of LMX including loyalty and contribution in Western studies is merged into one dimension of China-specific LMX, called loyalty and contribution. The connotation of loyalty is also vastly different. In Western culture, loyalty refers specifically to public support, while in the Chinese context it is a concept with rich connotations, including not only public support but also having courage to provide earnest advice, being good at seeing the viewpoints of leaders, and demonstrating honesty and trust. The dimensions of China-specific LMX also include the creation of an inner circle and disobedience, but lack professional respect (Ren, Yang, Wang, & Lin, 2014; Ren, Yang, & Wang, 2010; Wang, Niu, & Kenneth, 2004). The survey based on a self-made questionnaire by Liu and Lei (2008) reached similar conclusions to those drawn by Liden and Maslyn (1998), namely that LMX has four dimensions: contribution, respect, support, and loyalty. Because of the differences between Western and Chinese cultures, the terms "respect" and "loyalty" have wider meanings in China's context. Respect also includes the subordinates' admiration for leaders' work attitudes and other qualities unrelated to work. Chinese workers also show loyalty to leaders in other aspects except work.

### **2.2.3.1 One-dimensional measurement**

Based on the assumption of the one-dimensional LMX concept, Duchon, Green, and Taber (1986) developed a five-question LMX scale. Scandura and Graen (1984) developed LMX-7 to measure the characteristics of LM work relationship, including satisfaction with work relationship, understanding of work problems and requirements. A meta-analysis by Gerstner and Day (1997) suggests LMX-7 has good reliability, with Cronbach's  $\alpha$  ranging from 0.8 to 0.9. Scandura and Graen (1984) pointed out that LMX-7 has been widely used. Hui translated LMX-7 into a Chinese version and used it in a Chinese context, which reports satisfactory internal consistency, with Cronbach's  $\alpha$  ranging from 0.73 to 0.86 (Hui, Law, & Chen, 1999; Wang et al., 2004).

### **2.2.3.2 Multi-dimensional measurement**

Liden and Maslyn (1998) put forward a four-dimensional LMX scale to measure LMX from perspectives of subordinates and leaders. The scale has 12 items, with each dimension involving three items. The reliability value of scale ranges from 0.66 to 0.86.

Wang et al. (2004) translated the scale into a Chinese version and added another four items to it. The survey results show the questionnaire has good reliability and validity; the value of Cronbach's  $\alpha$  ranges from 0.67 to 0.89. The confirmatory factor analysis shows the scale has a high fitting degree and good construct validity.

Liu and Lei (2008) developed a four-dimensional LMX scale (contribution, respect, support, and loyalty), which is similar to the research results of Liden and Maslyn (1998). The questionnaire developed by Liu and Lei (2008) has 18 items with good validity and reliability. The Cronbach's  $\alpha$  coefficient ranges from 0.84 to 0.92. The confirmatory factor analysis suggests the scale has good fitting degree and construct validity. The multi-dimensional LMX is a direct predictor of work performance.

The empirical studies on single dimensional LMX and multi-dimensional LMX by Wang et al. (2004) suggest both the multiple-dimensional LMX (emotion, loyalty, contribution and professional respect) and single-dimension LMX can be used as predictors of employees' work performance and contextual performance, but the former performs better than the latter.

### **2.2.4 Antecedents of LMX**

The antecedents to the LMX relationship have been intensively researched, which mainly includes leaders' role, members' role, degree of similarity between two parties, organizational and other situational factors (Ren & Wang, 2005).

#### **2.2.4.1 LMX studies from leaders' perspective**

Leaders are often more willing to contribute more to the relationship in order to encourage their subordinates to bring more unexpected returns. With the power difference between leaders and subordinates, the leaders often have greater influence in

the process of LMX formation. For example, the leaders' character and behaviors can affect LMX.

The leaders' character mainly includes emotions and personality traits. The LMX is correlated with leaders' positive and passive emotions (Bauer & Green, 1996). There is a significant positive correlation between leaders' negative emotions and LMX quality (Day & Crain, 1992). For organizations of the same scale, leaders with stronger negative personality traits such as self-admiration and fondness of flattery are more likely to form a high-quality LMX relationship. However, when an organization scale is expanded, the fondness of being flattered will negatively affect the LMX relationship because of the leaders' limited time and social resources (Schyns, Maslyn, & Veldhoven, 2012).

Leaders' behaviors mainly include performance, leadership style, and personality traits. Nahrgang, Morgeson, and Ilies (2009) argued leader's performance is positively correlated with LMX quality. The relationship between leadership style and LMX has been increasingly studied and most of the studies argue that the mild and positive leadership style will result in higher LMX quality. Krishnan (2005) believed transformational leadership style makes the relationship between leaders and subordinates more stable. Wang, Law, Hackett, Wang, and Chen (2005) contended that transformational leadership style can positively predict LMX and further affect organizational citizen behavior and task performance. In the empirical study of the relationship between transformational leadership and LMX, Peng (2014) found that humanistic care has a significant positive impact on LMX. Huang, Jia, Gui, Zhu, and Liu (2015) argued that servant-oriented leaders perform well in mobilizing the enthusiasm and stimulating potentials of their employees, and that they are also good listeners and show great care for employees, which will positively affect the LMX relationship. According to (Xiao & Zhao, 2017), ethical leadership can significantly affect the level of LMX.

#### **2.2.4.2 LMX studies from subordinates' perspective**

Apart from the leaders' perspective, the LMX theory also studies leadership effectiveness from the perspective of subordinates. The research results of LMX's antecedent variables show that subordinates' capabilities, emotions, and behaviors have an effect on LMX quality.

Dockery and Steiner (1990) argued that subordinates' capabilities and personal traits are closely related to LMX. They pointed out that in order to achieve organizational goal, leaders intend to choose highly capable, loyal, and potential subordinates and provide them with the resources and support they need to accomplish their tasks. In such situations, a high-quality LMX relationship will easily form. Day and Crain (1992) believed that the subordinates' cognitive ability and negative emotions have an effect on LMX. LMX is not only affected by subordinates' capabilities but also by their achievement motivation and degree of credibility (Graen & Scandura, 1987). Subordinates with positive emotions and high intelligence can significantly predict LMX, and the subordinates' positive traits can affect the perceptions of leaders towards their subordinates' contribution and work engagement. Conversely, subordinates with negative emotional traits will negatively affect LMX (Xiao & Zhao, 2017).

Subordinates who feel grateful can often achieve higher-quality LMX (Liang, Li, & Chen, 2014). The high loyalty of the subordinates is also an important contributor to high-quality LMX and has a positive effect on LMX. Meanwhile, it can affect task performance and affective commitment through LMX. Especially when they work for a kind leader, the influence is stronger (Zhang, Li, Liu, & Peng, 2016). Chiaburu (2005) pointed out that there is a close relationship between the achievement goal and LMX among subordinates. For example, the learning goal can effectively predict the LMX. Subordinates who tend to develop harmonious interpersonal relationships can enjoy high-quality LMX, while interpersonal conflict can negatively affect LMX (Huang & Chen, 2015).

### **2.2.4.3 Similarity between leaders and subordinates**

The similarity in some demographic variables, such as gender, as well as expectation and preference, can all affect a LMX relationship.

Affected by social attribution and social identification, members who are similar to the leader in demographic variables are more likely to establish good relationships with their leaders and develop high-quality LMX. Duchon et al. (1986) found that same-gender relationships are regularly more successful than mixed-gender ones. Other research suggests that a mixed-gender relationship can significantly affect LMX; the LMX of female managers and male leaders is the highest (Zhang, Yin, & Wang, 2014). Bauer and Green (1996) argued that the similarity of leaders and subordinates in positive affectivity is indirectly linked with LMX quality. The similarity between leader and subordinates in positive performance assessment and personal characteristics can positively affect LMX quality (Zhang, An, & Yang, 2012).

The perceived similarity between leader and subordinates can significantly affect LMX. If either leader or subordinates find they share perceived similarity, the LMX of the other party will be significantly affected (Liden & Maslyn, 1998). The perceived attitudinal similarity is related to LMX (Engle & Lord, 1997). The similarity between collective identification and LM identification can positively affect LMX (Jackson & Johnson, 2012).

### **2.2.4.4 Organizational and other situational variables**

Green, Anderson, and Shivers (1996) argued that team size, work nature, and available organizational resources are positively related to LMX, and that the number of departments is significantly related to LMX (Henderson, Liden, Glibkowski, & Chaudhry, 2009). Dienesch and Liden (1986) claimed that LMX is affected by the number of team members, leader's power, organizational policies, and culture. In the Chinese context, Zhang et al. (2012) reached similar conclusions that the number of team members and the degree of work intensity, organizational atmosphere, post power, and organizational resources can significantly affect LMX.

Organizational justice can affect organizational support and leaders' rewards and punishments can directly affect LMX (Wayne, Shore, Bommer, & Tetrick, 2002). Liang, Tang, and Wang (2008) empirically concluded that organizational behaviors can affect LMX and organizational justice and POS can positively predict LMX.

Ren et al. (2017) studied the mediating effect of Chinese culture on LMX and considered that power distance and individual traditionalism can regulate their work outcomes and mental health. High power distance refers to the subordinates' reluctance to communicate with the leader because he/she believes that the current status of the organization is maintained through respect and obedience to the leader. When the high power distance of the subordinates is high, LMX has a stronger effect on the work performance and organizational citizenship behavior of the subordinates. Not only the norms of reciprocity, but also the asymmetrical power between the upper and lower levels, can influence the LMX (Lu & Sun, 2016).

### **2.2.5 Effect of outcome variables of LMX and impact mechanism**

LMX is essentially a social exchange relationship, and different types and quality of LMX have different effects on individuals, teams, or organizations. Studies of the outcome variables of LMX appeared relatively early and have achieved fruitful research results. Henderson et al. (2009) argued that the outcome variables of LMX can be studied from perspectives of leadership, employee, team, and organization. In general, the outcome variables are mainly researched from perspective of subordinates, which include positive and negative attitudes and behaviors.

#### **2.2.5.1 Positive attitudes and behaviors**

Subordinates who enjoy high-quality LMX are given more trust, guidance, resources, and opportunities from supervisors. Feeling obliged to reciprocate the goodness, the subordinates will work harder and perform at a high level. They enjoy high job satisfaction, affective commitment, and loyalty, and have active organizational citizen behavior and high innovative ability.

### (1) Job satisfaction

LMX is positively correlated with the work attitude of subordinates and, in particular, can positively predict job satisfaction (Gerstner & Day, 1997). Because of the frequent exchanges between high-quality LMX knowledge members and leaders, they can obtain more organizational resources, opportunities and trust, and are therefore more likely to become in-group members. With the deep-rooted Chinese traditional culture concepts such as “A drop of water in need, shall be returned with a spring in deed” in mind, subordinates who perceive high-quality LMX will fully involve themselves in work and show more loyalty to their leaders and organizations (Zeng, 2012a). There is a significant correlation between leadership and organizational loyalty (LMX) and subordinates’ job satisfaction, and organizational justice plays a full mediating role between them (Graen, Novak, & Sommerkamp, 1982; Yu, 2014). Lu (2014) also confirmed that LMX (including emotion, loyalty, contribution, and professional respect) can positively predict employee job satisfaction, while organizational justice plays a mediating role between them.

### (2) Organizational citizenship behavior (OCB)

Wang et al. (2005) found that LMX can positively predict subordinates’ OCB. Ni and Chu (2010) found that leaders’ self-esteem plays a full mediating role between them. Zeng (2012a) pointed out that the positive impact of knowledge employees’ LMX on their OCB is more significant than that of other types of employees, and work attitude plays a partial mediating role between them. Tang and Song (2015) confirmed there is a significant positive correlation between LMX and OCB, and pointed out that subordinates’ demand satisfaction has a moderating effect on OCB. The degree of subordinates’ relationship and survival needs satisfaction has a decisive impact on LMX effectiveness.

### (3) Innovation

Innovation is crucial to the organization development, especially to the knowledge-intensive industries. Some scholars have explored the relationship between

LMX and employee innovation and performance. Qu, Wang, Jiao, and Shi (2013) found that LMX has a positive impact on the innovative behavior of R&D employees and significantly improves comprehensive performance. Pei, Li, and Gao (2013) claimed that LMX and internal motivation play a full mediating role between leadership style and the creativity of research team members.

### **2.2.5.2 Negative attitudes and behaviors**

Subordinates who enjoy high-quality LMX have positive work attitudes and behaviors. They work harder and enjoy high job satisfaction (Graen et al., 1982; Yu, 2014), and thus have low TI and job burnout and less reticent behavior (Gerstner & Day, 1997; Xiao & Zhao, 2017).

#### **(1) TI**

Based on the previous studies, Graen and Uhl-Bien (1995) pointed out that there is a negative correlation between LMX and TI. Gerstner and Day (1997) also noted that high-quality LMX has a positive impact on job satisfaction and a significant negative impact on turnover. Two studies by Vecchio (1985) and Vecchio and Norris (1996) failed to confirm that LMX is negatively related to TI. By studying 402 employees from a water management company and 183 employees from a distribution service organization, Harris, Kacmar, and Witt (2005) found the relationship between LMX and TI is curvilinear rather than linear. The better the LMX quality, the lower the TI. Once a tipping point has been reached, the LMX quality will positively correlate to TI. Although the relationship between LMX and positive behaviors such as OCB have been extensively studied with fruitful results, the relationship between LMX and negative behaviors such as TI is rarely studied and remains unknown. According to (Zeng, 2012b), LMX can negatively affect TI and AC plays a moderating and mediating role between the LMX and TI. Xiao and Zhao (2017) argued that LMX plays a mediating role between ethical leadership and TI.

#### **(2) Job burnout**

Allen, Campbell, Perry, Maertz, and Griffeth (2013) noted that an important

method for subordinates to deal with job burnout is to obtain work resources from leaders and social support. Huang, Chan, Lam, and Nan (2010) found that in-group members can get sufficient work resources and psychological support to cope with work and interpersonal stress, and that LMX is negatively correlated with employee job burnout. Ren et al. (2017) argued that LMX has a significant negative impact on the job burnout of subordinates. Lu and Sun (2016) also confirmed that there is a significant negative relationship between LMX and emotional exhaustion.

However, there are also studies that suggest LMX may have a negative impact on the work attitude of subordinates. In high-quality LMX, subordinates' obligations to work with utter devotion may make them physically and mentally exhausted and lead to an increase in work pressure (Harris & Kacmar, 2006). Jiang, Law, and Sun (2014) suggested that high-quality LMX can give in-group members access to more work resources. According to the resource exchange theory and work requirements-resource model, high-quality LMX is related to two kinds of job burnout: in high-quality LMX, the supervisors' high expectation of followers leads to the exhaustion of subordinates; in low-quality LMX, the members of the out-group do not receive any additional attention or benefits, so they feel unmotivated and become cynical.

### (3) Employee silence

LMX is significantly related to employee's silence behavior. High-quality LMX can help create a highly trusted organizational atmosphere in which employees are motivated to speak up and express ideas, information, and opinions about work-related improvements. Organizational trust plays a full mediating role between LMX and employee silence (Zhou, Zhang, & Zhao, 2011). An empirical study by Zheng, Zheng, and Liu (2015) proved that LMX is negatively correlated with employee silence, and the more employees are motivated, the stronger the negative impact is.

## 2.2.6 LMX research review

With its unique perspective, the LMX theory has aroused the attention of

management scientists and psychologists and has been developed rapidly. Research results show that LMX has a positive correlation with positive variables such as job satisfaction, organizational citizenship behavior, and innovative behavior, but is negatively correlated with negative variables such as TI, job burnout, and employee silence. A review of the previous studies of LMX concept, constructs, measurement and variables by foreign and Chinese scholars shows that LMX theory is still inadequate and much work remains to be done in the future. Although cross-cultural studies of LMX have been conducted, the current LMX cross-cultural studies center mostly on Western culture. In China, most public hospitals are – unlike ordinary enterprises – public institutions run for the public good and have a certain administrative level. Therefore, applying Western LMX theories in Chinese public hospitals is under speculation. The future research background should be extended to the service industry, especially the healthcare industry. Exploring the relationship among LMX and customers, work pressure, emotional labor, and performance can enrich the LMX theory and provide management guidance for the healthcare industry. Therefore, conducting LMX research according to China’s conditions has important theoretical and practical significance.

### **2.3 Occupational commitment**

Because of frequent job changes across organizations, researchers pay more attention to OC than organizational commitment (Blau, Chapman, Pred, & Lopez, 2009). Therefore, the OC has become increasingly important.

The profession is a complex concept. Terms such as occupation, career, profession, and vocation are all used to describe the way in which a person earns a living (Long, Fang, Ling, & Li, 2000). Meyer, Allen, and Smith (1993) argued that the academic concepts of profession are interchangeable and can all be understood as OC. The term “OC” used in the present study has been widely recognized and used by different occupations and organizations (Arora & Rangnekar, 2015; Meyer et al., 1993).

### **2.3.1 Concepts**

The concepts of OC are variously interpreted and defined by scholars from perspectives of attitudes and behaviors (see Table 2-3).

Studies of OC in China started relatively late. Long et al. (2000) defined OC as the extent to which an employee desires to stay in his/her profession as a result of identification with and emotional attachment to the profession, work engagement, and internationalization of social norms. According to Long, Long, and Wang (2002a), OC refers to an employee's commitment to his profession; otherwise known as a psychological contract formed between an employee and his/her profession. Li, Shi, and Wang (2006); Pei and Liu (2006) argued that OC is how much an individual identifies with his/her profession and sets his/her heart to it.

In summary, although scholars have interpreted and defined OC in different perspectives, they all agree that OC reflects an individual's affective attachment to his/her profession and willingness to take responsibilities and fulfill obligations.

Table 2-3 Definitions of occupational commitment

Scholars	Time	Definition	Core theory	Theoretical Perspective
Hall, London	1971, 1983	An individual’s motivational intensity of his/her profession, including three components such as career identity, career insight, and career resilience (Hall, 1971; London, 1983)	Occupational motivation intensity	Motive theory
Blau	1985	An employee’s feeling and attitude towards a career and desires to stay in their current profession (Blau, 1985)	Feeling, beliefs	Attitudinal approach
Meyer, Allen	1993	Borrows the three components of organizational commitment into occupational commitment – namely, affective commitment, continuance commitment and normative commitment (Meyer et al., 1993)	Emotion	Attitudinal approach
Vandenberg, Scarpello	1994	Identifies with and recognizes professional values and is willing to stick with a profession (Vandenberg & Scarpello, 1994)	Value recognition and willingness	Attitudinal approach
Jong	1999	A person’s degree of involvement in a profession, which is the core of an individual’s life and career, with emphasis on professional orientation and career plan (Jong, 1999)	Give and take	Behavior theory
Lee	2000	After meta-analysis, the occupational commitment is defined as the emotion-based psychological bond built up between an employee and his profession (Lee, Carswell, & Allen, 2000)	Emotion	Attitudinal approach
Goulet, Singh	2002	The degree to which an employee identifies with professional value and the extent to which he/she is willing to take efforts and time for career development (Goulet & Singh, 2002)	Value recognition and willingness	Attitudinal approach
Lowrey, Becker	2004	Desire of a person to involve him/herself in the activities of this profession (Lowrey & Becker, 2004)	Give and take	Behavior theory

### 2.3.2 Theory of OC and measurement

Different interpretations of OC by scholars have led to various results of OC’s structure and measurement, which are summarized below.

#### 2.3.2.1 Single dimension theory of OC and scale

The earlier studies of OC represented by Blau (1985) suggest that OC has only a

single dimension, namely affective commitment (AC).

The previous measurements of OC were mainly developed by Greenhaus and Morrow based on their studies of career characteristics. Greenhaus (1971,1973) employed the factor analysis method to extract three factors from 28 items, which include: (1) General work attitude, for example, “work is one of disasters a man abhors but has to face”, or “only by enjoying the work can the life be satisfying”; (2) career plan, for example, “I am happy to think about and plan my future career”; and (3) importance of work (preferences for work and non-work activities), for example, “I hope to choose my profession as I wish even if my friends do not like it too much”. In her study of OC, Morrow (1983) reviewed Greenhaus’s (1971,1973) OC scale and found there are some overlaps between some items in Greenhaus’s scale and other conceptual contents of OC, such as central life interests, work engagement, and work ethics. After studying the occupational orientation, Marshall and Wijting (1982) found two factors – namely, career centreness and OC –to suggest that OC is a general commitment to work throughout all stages of life. For example, one of the measurement items is “the degree of involvement of work into life”. Meanwhile, overlaps exist between the OC definition and the importance or centreness of work in an individual’s life (also known as work engagement) put forward by (Gorn & Kanungo, 1980).

The above-mentioned studies show there are significant overlaps among scales of work engagement, work centreness, professional value, and OC. Therefore, Blau (1985) put forward the one-dimensional OC and defined OC as an individual’s attitude towards his or her profession. Based on the professional commitment scale (Price & Mueller, 1981) and the professional orientation scale (Liden & Green, 1980), Blau designed a one-dimensional OC scale meant to assess an employee’s fondness for his/her current job and willingness to stick with it. The scale has eight items. A longitudinal empirical survey of 119 registered nurses based on this scale shows that OC is independent construct (Blau,1985). Blau’s scale has been widely used. Blau’s longitudinal surveys of newspapers managers and office staff in insurance companies (Blau ,1988) and full-

time telephone operators in banks (Blau, 1989) further proved the scale has good reliability and validity and can be well differentiated from work engagement and OC (Morrow, 1993). Blau (1988) revised his OC scale into a seven-item scale.

### **2.3.2.2 Three-dimensional OC theory and scale**

Noe, Noe, & Bachhuber (1990); Carson and Bedeian (1994) proposed the three-dimension theory of occupational motivation, while Meyer & Allen (1991) proposed the three-dimension theory of OC.

#### **(1) The motive-based three-dimensional OC theory and scale**

According to motivation theory, OC reflects an employee's will to pursue career success based on career identity. The three-dimensional OC theory was mainly developed by Hall and London. Hall (1971) defined OC as "An individual's motivational intensity of holding on his profession" and thought OC should be separated from work commitments and work engagement and studied separately. London (1983) viewed OC as career motivation, which includes work motivation, management motivation, career decision-making, and other motives related to career behaviors (career identity, career insight and career resilience). Career identity defines the direction of career motivation, while career insight and career resilience reflect the incentive intensity and pressure resistance of career motivation (Long et al., 2000). Based on his theory of career motivation, London formulated a questionnaire about employees' feelings and attitude, with 17 items under three dimensions. The reliability of the three dimensions is more than 0.8 and the correlation coefficients are high, ranging from 0.42 to 0.52 (London, 1993).

Noe et al. (1990) designed a questionnaire on career motivation that included three dimensions: career identity (eight items), career insight (five items), and career resilience (13 items). Research found the three sub-scales strongly correlate with each other, with correlation coefficients being 0.4, 0.44, and 0.58, respectively. However, their reliability is low, at 0.76, 0.64, and 0.74, respectively (Noe et al., 1990). Because the correlation coefficients of Noe et al. (1990) questionnaires are too high and the

reliability is not high, the questionnaires have not been used widely.

Carson and Bedeian (1994) argued that OC has multiple dimensions, including career identity, career resilience, and career plan. They replaced the dimension “career insight” with “career plan” and posited that career planning is about setting future goals for personal development. By means of literature review, expert judgment, and factor analysis, Carson and Bedeian (1994) repeatedly revised 87 items and finalized three dimensions, each with four items. The reliability of the three dimensions is good, with Cronbach’ s  $\alpha$  ranging from 0.79 to 0.85, and good differentiation.

## (2) Three-dimensional OC theory and scale based on organizational commitment

In the study of organizational commitment, Becker (1960), from perspective of economics, found that the more time and energy an employee invests in an organization, the more he/she is afraid of the high costs of losing organizational membership and the more reluctant he/she is to leave the organization. Until the 1970s, scholars argued that, in addition to the occupational investment and fear of economic losses put forward by Becker, emotional attachment is also an important factor influencing employees’ organizational commitment (Buchanan, 1974). In the 1980s, from a sociological perspective, Wiener pegged normative commitment as the “obligation” component of organizational commitment. An employee feels obliged to be loyal to his/her organization because the organization may have invested resources in training the employee, who then feels a moral obligation to put effort into the job and remain with the organization to “repay the debt”. It may also reflect an internalized norm customized to the requirements of organization (Scholl, 1981; Wiener, 1982).

Based on the systematical analysis and combining with the views of Becker, Buchannan and Wiener, Meyer and Allen (1991) extended the organizational commitment model, originally consisting of only affective commitment, to a widelyaccepted three-component model, including affective commitment (AC), continuance commitment (CC), and normative commitment (NC). Later, enlightened by the theory of organizational commitment, Meyer et al. (1993) found that multi-

dimensional OC has multiple dimensions, which can roundly reflect a person's psychological state; they also applied the theory to the study of OC and thought that OC should also include the AC, CC, and NC because, compared with organizational commitment, it is just a change of object committed from organization to profession. Affective commitment is defined as the employee's desire to keep to his/her profession in line with his/her career goals, interests, and aspirations. This employee commits to the profession because he/she "wants to". An individual may commit to the profession because he/she perceives a high cost of leaving the current profession or cannot find other job elsewhere temporarily; higher continuance commitment can be understood as a "need" to stick with a profession. An individual commits to and remains with a profession because of feelings of obligation evoked by a professional code of ethics; higher normative commitment means the employee stays with a profession because he/she feels they "ought to" (Meyer et al., 1993). AC and NC represent the active behavior of remaining with a profession, while CC is a passive behavior of holding on a job. Based on the organizational commitment scale, Meyer et al. (1993) designed the OC scale with 30 items. After the factor analysis of the survey among registered nurses and nursing students, the scale was condensed into 18 items; three dimensions with six items each.

After Chinese scholar Long(2000) first introduced the OC concept into China in 2000, Long and Li (2002) used the three-dimension OC scale to measure the OC of China's teachers and found the validity of each dimension is good, with validity coefficients ranging from 0.74 to 0.88. Long et al. (2002a) applied the scale to the survey of nurses and also found the scale has high reliability, with Cronbach's  $\alpha$  ranging from 0.77 to 0.86.

### **2.3.2.3 Four-dimensional OC theory and scale**

Based on the studies of occupational entrenchment by Carson, Carson, and Bedeian (1995), Blau (2003) put forward the four-dimensional OC theory.

Carson et al. (1995) believed career entrenchment includes three dimensions:

occupational investment, emotional costs, and limitedness of occupational alternatives. Occupational investment refers to an individual's accumulated investment or costs such as time, money, and trainings received in his/her career development. The losses of occupational investment may occur if an individual changes his/her profession. Emotional costs refer to the expected emotional losses of finding a new profession, such as disrupted friendship ties with co-workers and the emotional disturbance caused by a switch to a totally new profession (Becker, 1960). The limitedness of occupational alternatives refers to the degree to which an individual perceives the unavailability of alternatives. By sustaining the occupational investment and reducing the loss of emotional costs, an employee can shift his/her perception of the working environment in the process of finding a new job. As time passes, shortsightedness will lead to diminished job opportunities (Carson&Carson, 1997). Carson et al. (1995) measurement of occupational investment suggests that losses such as time and trainings may occur if an individual changes his/her job. In fact, the connotation of occupational entrenchment partially overlaps with that of continuance commitment (CC) in organizational commitment. However, occupational entrenchment mainly focuses on the perceived costs and availability of occupational alternatives related to personal career (Becker, 1960).

After revisiting the continuance commitment of Meyer et al.'s (1993) three-component OC scale, Blau (2001) pointed out that CC is mainly employed to measure an employee's perceived costs of leaving an organization, but fails to identify the limited alternatives and losses in time and training (Blau, 2001) because all these factors will have effects on an individual's change of profession (Carson, Carson, Phillips, & Roe, 1996). For example, the higher the accumulated costs (such as education and training received), the more difficult it is for an individual to change profession. However, although an individual continues to be given other material benefits, such as paid vacation and tuition reimbursement by the organization, he/she is still likely to leave (Bradford, 2001; Fletcher, 2001). The perceived limited occupational choices give

a person a sense of unavailability of alternatives (Carson & Carson, 1997). Therefore, Blau (2003) believed the occupational entrenchment theory is helpful to measure the accumulated costs and limitedness of occupational alternatives. Based on his four-dimensional OC theory, Blau (2003) designed a 24-item scale and used it in the surveys of three group samples including 230 pharmacists, 412 ordinary staff, and 227 MBA graduate students. The survey results show the internal consistency of each dimension is more than 0.81. Blau further revised the scale. Blau and Holladay (2006) further subdivided Meyer's continuance commitment into accumulated costs and limitedness of occupational alternatives, among which accumulated costs include occupational investment and emotional costs. Based on this, Blau and Holladay (2006) proposed a four-dimensional OC model, including affective commitment, normative commitment, costs (accumulated costs) commitment, and opportunities commitment (limited alternatives).

The four-dimensional OC scale is widely used by Chinese scholars. After a survey of 330 employees in Chinese enterprises using this scale, Chen and Li (2006) used confirmatory factor analysis to confirm that the OC of Chinese enterprises includes affective commitment, normative commitment, cost commitment and limited occupational alternatives. Based on Blau's (2003) four-dimensional questionnaire, Pei, Liu, and Tao (2007) divided cost commitment into emotional cost commitment and economic cost commitment and designed a five-dimensional, 24-item OC scale specifically for Chinese doctors, which includes affective commitment, normative commitment, emotional cost commitment, economic cost commitment and limited alternatives commitment. The Cronbach's  $\alpha$  of the questionnaire is 0.91.

### **2.3.3 Antecedent and outcome variables of OC**

#### **2.3.3.1 Antecedent variables of OC**

Studies of the antecedent variables of OC have mainly focused on demographic variables, personality traits, and environment variables.

(1) Demographic variables

The OC-related demographic variables in the foreign and China’s studies mainly include gender, age, working age, and educational background.

In terms of the correlation between gender and OC, scholars have reached different conclusions. Irving, Coleman, and Cooper (1997) study of doctors showed that gender correlates to continuance commitment (CC) and the CC of men is higher than that of women; there is no significant correlation between gender and affective commitment (AC) or normative commitment (NC). Some scholars have argued that the OC level of women is higher than that of men because the former might encounter more difficulties after joining the workforce (Parasuraman & Nachman, 1987). Liu, Sun, and Su (2011) surveyed 7877 workers in large electronic enterprises in China and found that gender correlates to OC and male employees have high OC. However, other scholars have drawn the opposite conclusion (Lee et al., 2000).

Some scholars have argued that time variables such as age and working age positively correlate to OC (Colarelli & Bishop, 1990) because the accumulated occupational investment (Becker, 1960) generates a strong sense of career identity. Research by London and Blau suggests the working age of nurses is significantly and positively correlated with OC (Blau, 1985; London, 1983). Meyer and Allen (1984) posited that age could be correlated with OC because, as time passes, age (also known as seniority) can help long-time employees get promoted. Age might also correlate to continuance commitment because age is also a consideration for talent investment in an organization. Meyer et al. (1993) found that age is correlated with affective commitment and normative commitment, but has no correlation with continuance commitment. Chinese scholars Li (2013); Long, Long, and Wang (2002b); Zhang (2015) all argued that age and working age have a significant positive effect on OC. Long et al. (2002b) believed working age negatively correlate to AC. Irving et al. (1997); Lee et al. (2000) claimed that age has no correlation with OC.

The correlation between education background and OC is also highly debated

among scholars. Education background positively correlates to OC and there is a significant difference between employees' accumulated costs, while there is no statistically significant difference between employees' ideal commitment, affective commitment and limited alternatives. A possible reason for this is that highly-educated people have high occupational investment and can therefore try to avoid the huge losses because of profession change (Su, 2014). However, some other studies claim the opposite. Morris and Sherman (1981) believed that the higher the education background, the lower the OC. Long et al. (2002b) surveyed 426 nurses in Wuhan and found the higher the education background, the lower the AC. Irving et al. (1997); Meyer et al. (1993) hold that there is no correlation between education background and OC. Chinese scholar Liu et al. (2011) holds the same view.

The correlation between marital state and OC is less studied and, if anything, has no consistent conclusions. Blau (1985) argued that marital state is significantly correlated with OC and that married employees have higher OC. Marital state negatively correlates to normative commitment (Wang, 2007; Yi, 2013). A survey of 100 nurses in Tangshan in China by Zhang, Meng, Lu, and Liu (2012) found that the OC level and occupational pressure of married nurses are both higher than those of unmarried nurses. Lee et al. (2000) insisted that marital state has no correlation with OC.

## (2) Personality traits

Personality traits refer to the totality of a person's distinctive thoughts, feelings, attitudes, and behavioral patterns. Because OC reflects an employee's attitude or behavioral tendency towards his/her profession, it is inevitable that OC will be affected by an individual's personality. Contemporary Chinese studies on the correlation between personality traits and OC have mainly focused on such aspects as locus of control, big five personality, and 16PF (16 personality factors).

Scholars found that locus of control is negatively correlated with affective commitment but positively correlates to continuance commitment; the OC level of

internal locus of control is higher than that of external locus of control (Irving et al., 1997; Lee et al., 2000). Blau (2003) found that employees with internal locus of control have stronger affective commitment, which further supports the views of Lee and Irving. The reason is that when employees with internal control orientation feel unhappy, they will just do what they are supposed to do in order to enjoy their work, and thus have higher affective commitment. After studying the correlation between big five personality traits and OC, Rodney and Wise (2002) found that neuroticism has a negative impact on OC and extraversion is positively related to OC.

A correlative study of 16PF and OC among 693 students of police school in Xinjiang China by Zhang (2014) suggests that sensitiveness in personality characteristics is negatively correlated with OC; conscientiousness negatively correlates to continuance commitment; intelligence is negatively related to affective commitment; agreeableness and stability are positively correlated with affective commitment; and stability and intelligence positively correlate to normative commitment.

### (3) Environment variables

Environmental influencing factors mainly include work–family conflict and social environment. Liu (2011) found that work–family conflict is negatively correlated with OC among teachers. A survey of nurses and teachers by Goulet and Singh (2002) suggested that there is no significant correlation between family support and OC, and that their relationship therefore needs to be further studied.

A survey of 596 pharmacists by Wolfgang (1995) found that OC is positively correlated with the support of coworkers. Perceived organizational support (POS) has a significant positive effect on the AC, CC, and NC of new generations of highly educated employees. The “well-being care” among the three dimensions of POS has a positive impact on OC (Yi, 2013). Yu (2009) found the POS of knowledge talents has an effect on affective commitment and career dynamics, but exerts no influence on continuance commitment and loyalty. Liu (2012) found that emotional support has no

significant effect on OC, but that the practical support has a significant effect on OC. Support from students, students’ parents, school leaders, co-workers, and friends can effectively predict or explain OC level; among these, student support has the biggest effect on OC, followed by school leaders.

The environmental factors of OC also include work factor, work security, and leadership style. Blau (1985) found that job role ambiguity and leadership style are good predictors of OC. Lee et al. (2000) found that role ambiguity and job pressure correlate to OC. Goulet and Singh (2002) argued that work adapt ability and work security are important predictor variables of OC. Chinese scholars Liu et al. (2011) held that work diversity and work-individual match are positively correlated with OC. Liu, Liu, and Cai (2014) found that the service-oriented leadership behaviors of head nurses positively correlate to nurses’ OC. Wang and Zhang (2007) found that Chinese employees’ working place and salary are associated with OC.

### **2.3.3.2 Outcome variables of OC**

The outcome variables of OC, including positive variables and negative variables, mainly reflect an individual’s psychological behaviors. The positive variables include organizational citizenship behavior, work engagement, job satisfaction, organizational commitment, career success, and work performance (Blau, 1985; Carson & Carson, 1998; Lee et al., 2000); negative variables include TI and job burnout (Lee et al., 2000; Meyer et al., 1993).

#### **(1) Positive variables**

Scholars found that OC positively correlates to organizational citizenship behavior, job satisfaction, organizational commitment, career success, and work performance, but its correlation with work engagement remains unclear.

Carson and Carson (1998) found that nurses with high OC have high organizational citizenship behavior. Wang (2007) argued that affective commitment and normative commitment are both significant predictors of organizational citizenship behavior. However, continuance commitment and ideal commitment have

no significant prediction on organizational citizenship behavior. Li (2001) held that affective commitment, normative commitment, and continuance commitment have a significant positive correlation with organizational citizenship behavior. After surveying rural teachers, Xie, Gong, and Zhang (2011) concluded that the affective commitment of rural teachers can effectively predict organizational citizenship behavior, and that normative commitment is a good predictor of in-role behavior, organizational citizenship behavior, and self-fulfilling behaviors.

The relationship between OC and work engagement remains ambiguous. Some scholars think the leaders can improve employees' work engagement through incentives, thus improving OC level. A longitudinal study by Blau (1985) found that work engagement is linked to OC. By surveying 400 employees in Changchun State - owned and private enterprises in Jilin province, Wo (2013) found that work engagement has a significant positive relationship with OC and a significant relationship with AC, NC, and cost commitment, but no relationship with limited alternatives. Other scholars argued that OC level can affect work engagement and that OC is associated with work engagement (Lee et al., 2000). Morrow and Mcelroy (1986) showed that five variables, arranged in a logical order are work ethics, OC, continuance commitment, affective commitment, and work engagement, and that OC is directly affected by personality traits and further affects work engagement. Therefore, whether the OC is a precondition of work engagement needs to be further studied.

Irving et al. (1997) and Meyer et al. (1993) found job satisfaction to be positively correlated with affective commitment and normative commitment and that the correlation between job satisfaction and affective commitment is stronger than that between job satisfaction and normative commitment. Lee et al. (2000) argued that OC significantly and positively correlates to overall work satisfaction and satisfaction with work itself. Wang, Tao, Ellenbecker, and Liu (2012) claimed that the OC of Chinese nurses has a significant positive correlation with job satisfaction. Tang, Ma, Li, and

Wang (2008) reached the same conclusions that the overall satisfaction, satisfaction with work itself and coworker satisfaction among China's doctors are related to OC.

The OC and organization commitment, both reflecting the employees' attitude towards profession or organization, are closely linked to each other. OC is positively correlated with organizational commitment. Employees with high OC will devote more efforts to their professions Meyer et al. (1993); Irving et al. (1997) argued that OC has a significant positive correlation with organizational commitment. Organizational commitment and OC are more closely linked to each other among professionals remaining on their original profession than they are among career-changing professionals; the same applies to the relationship between organizational commitment and OC when comparing non-professional staff with professional staff (both engaging in their original profession) in an organization. Blau (2003) verified the correlation between OC and organizational commitment concluded by Meyer and Irving, and further concluded that the AC of organizational commitment has a complete positive correlation with the AC of OC, and the same applies to the correlation between the NC of organizational commitment and NC of OC; the CC of OC is partially correlated with accumulated costs and limited alternatives.

Li (2001) argued that the AC, NC, and CC of OC have a significant positive effect on organizational commitment. OC positively correlates to organizational commitment and their interactions have a positive impact on job satisfaction (Li et al., 2006). Zhang (2008) argued that knowledge employees often find themselves in a dilemma when choosing between OC and organizational commitment because the increase of OC will inevitably lead to the decrease of organizational commitment, and vice versa. However, the empirical studies reveal that most dimensions of OC are positively correlated with organizational commitment.

Poon (2004) argued that OC is a good predictor of subjective and objective career success. A survey of 149 knowledge employees by Yu (2009) suggests that OC reflects an employee's passion, loyalty, persistence, and active emotions towards his/her

profession, and that OC has significant effect on career success. Yi (2013) concluded that OC has positive effects on various dimensions of career success among new generations of knowledge employees.

OC is closely correlated with work performance. According to Lee et al. (2000), there is a moderate positive correlation between OC and work performance. The OC-performance relationship is slightly closer than the relationship of performance and work engagement (or organizational commitment). Lee et al. also noted that it would be interesting to explore the variables that could modulate the OC and work performance relationship. For example, does OC affect work performance through the influence of work motivation, or accumulated personal skills and knowledge, or both? Li (2001) found that the AC, NC, and CC of OC have significant positive effects on work performance. Based on theoretical studies, Wang and Zhang (2007) concluded that OC positively correlates to work performance. Song (2014) found that OC plays a moderating role between emotional labor and work performance.

## (2) Negative variables

Studies have found that OC is negatively correlated with career switch intention, TI, and job burnout. Blau (1985) considered there to be a significant negative correlation between OC and career switch intention; TI negatively correlates with different kinds of commitments. The conclusions apply to both OC and organizational commitment. The relationship between TI and affective commitment is particularly significant (Meyer et al., 1993; Meyer & Allen, 1991). In contrast to Meyer's findings, Irving et al. (1997) found that TI is negatively correlated with NC, but has no significant correlation with AC or NC. Lee et al. (2000) believed OC is most closely connected with TI, which also proves it is the best single predictor variable. Lee et al. also found that OC has a close relationship with TI and resignation. Li (2001) argued OC is a good predictor of career switch and TI. Wang (2007) found that AC and NC have significant predictive power towards TI, but that CC and ideal commitment have no

significant predictive power towards TI. Pei (2014) considered OC to be negatively correlated with TI.

OC has a negative effect on job burnout (emotional burnout; reduced sense of accomplishment, depersonalization) (Lee et al., 2000). A survey of 457 library employees by Yi, Wang, and Zhan (2012) showed that the lower the OC, the higher the job burnout level. Therefore, job burnout is an important predictor of OC. Cui, Wang, Xu, and Qian (2015) found that higher OC of doctors can effectively offset the negative effect of work requirements on job burnout. Liu, Li, Long, and Zhan (2009) surveyed traditional Chinese medical doctors and concluded that OC has a significant negative effect on job burnout and that different dimensions of OC perform differently in terms of predicting job burnout; that professional efficacy is the main predictor variable of depersonalization; and that AC is the main predictor variable of personal accomplishment.

#### **2.3.4 Research review of OC**

Since the concept of OC was proposed, it has attracted a great deal of attention in psychology and management circles and the relevant studies have made rapid progress. Progress has been made in OC's influencing factors, impact mechanism, and outcome variables. The research results show that OC is positively correlated with positive variables such as work engagement and negatively correlated with negative variables such as TI and job burnout. Studies by foreign and Chinese scholars on OC's concept, constructs, measurement scales, and relationship between variables show that OC has broad prospects of application. However, a review of previous studies suggests that the OC still needs to be further studied. Relevant studies by scholars, both in China and elsewhere, are mainly oriented towards the OC among groups such as teachers, nurses, policemen, doctors, and knowledge employees. In terms of the OC among doctors and nurses, studies have mostly focused on the OC's current situation and influencing factors, while systematic research of OC among doctors and nurses in the

same social setting and organization – especially on the relationship between LMX, DPR, and OC – has not been found. Besides, the impact mechanism of OC remains unclear and research on impact mechanism of OC from perspectives of conservation of resources theory and social exchange theory is rare. Because of the major role of doctors and nurses in new health reform, the systematic research of OC among doctors and nurses has important theoretical and practical significance.

## **2.4 Turnover intention**

According to the willingness of employees, Price (1977) classified turnover into two types: voluntary and involuntary. Price’s voluntary research was further developed by other scholars. According to the effect of turnover on organization, Dan, Todor, and Krackhardt (1982) categorized voluntary turnover into functional and dysfunctional turnover. Functional turnover occurs when a low-performing employee leaves the organization of his or her own accord. Dysfunctional turnover occurs when a high-performing employee attempts to leave the organization, which can be potentially costly to the organization. Most voluntary turnover will have a negative effect on the organization, which is something the organization hopes to avoid. Thus, properly controlling the turnover rate by predicting voluntary turnover has aroused a high level of academic attention.

### **2.4.1 Definition of TI**

Turnover intention (TI) refers to employees’ thoughts or willingness to leave an organization, reflecting the employees’ psychological tendency before the actual turnover occurs. TI and turnover are two different but closely linked concepts. TI represents the thoughts of wishing to leave before actual action is taken, which is the antecedent variable of voluntary turnover. By contrast, turnover refers to the employee’s actual act of terminating the employment relationship with the employer and leaving the organization. A review of 23 studies on TI by Bluedorn (1982) found

there is significant correlation between TI and turnover behavior and TI is consistent with employees’ attitude, desire, and behavior. TI is an important concept of turnover theory because TI can effectively predict employees' turnover behavior (Lee & Mowday, 1987). Therefore, scholars pay high attention to the research on TI. The TI is variously defined by different scholars.

British scholars March and Simon (1958) held that employees’ turnover behavior is directly affected by their satisfaction with work and perceived alternative work opportunities, which reflects the extent to which employees want to leave an organization and seek a job elsewhere. Turnover behavior includes willingness to resign and possibilities of leaving.

Table 2-4 Main definitions of TI

Scholars	Definition
March and Simon (1958)	TI reflects the extent to which employees want to leave an organization and seek work elsewhere. Turnover behavior includes willingness to resign and possibilities of leaving.
Porter and Steers (1973)	TI is employees’ next avoidance behavior after experiencing dissatisfaction. After an employee feels dissatisfied with his/her current job, he/she might have thoughts of leaving and seeking work elsewhere. After weighing up the pros and cons and comparing alternatives, he/she has a TI, which represents the employees’ psychological state before actual turnover behavior occurs.
Mobley, Horner, and Hollingsworth (1978)	After experiencing dissatisfaction, employees tend to leave their jobs. Following employees’ turnover thought, job hunting and comparison of other job opportunities, TI is the last step before the actual turnover behavior occurs.
Meyer (1993)	TI manifests the employees’ willingness to leave an organization after careful consideration.

### 2.4.2 Models of turnover

In order to conduct an in-depth study of turnover behaviors, an array of turnover models have been constructed since the first turnover model was established by March and Simon in 1958. Based on these models, the influencing factors of employee TI and turnover behavior and impact mechanism have been explored extensively. Several

representative turnover models are discussed in this study.

(1) March–Simon model

The first turnover model was proposed by March and Simon (1958), which posited that the reasonability of turnover and possibility of leaving are two deciding factors for employee turnover. Alternative work opportunities determine how easy it is for employees to leave.

(2) Mobley Intermediary Chain Model

Based on March and Simon (1958), Mobley (1977) constructed the intermediary chain turnover model, which states that an employee's final decision to leave comes after 10 steps. The steps are: (1) evaluate current job; (2) feel satisfied or dissatisfied with current job (withdraw; behaviors such as being late for work, asking for leave, and having a negative attitude towards work); (3) generate thoughts of leaving; (4) evaluate expected work results; (5) assess costs of leaving; (6) have the intention of finding a new job; (7) seek jobs elsewhere; (8) evaluate potential job opportunities; (9) compare current job and alternatives; and (10) foster turnover. The model adds other influencing factors such as finding and evaluating different job opportunities between job satisfaction and turnover behavior, which presents the impact mechanism of job satisfaction or dissatisfaction on the actual turnover behaviors of employees. According to the core ideas of the model, employees will compare their current work conditions with further work conditions and assess the expected return of a new job and the costs of losing organizational membership. When an employee is not satisfied with his/her current work and has thoughts of resigning, this does not mean the employee is certain to leave, because he/she must consider the availability of alternatives. A high chance of finding other jobs leads to higher turnover.

(3) Price's turnover model

Price (1977) turnover model states salary, relationship with organization, performance feedback, communication, and centralization of power as the five antecedents of turnover. Job satisfaction serves as a mediating variable between these

antecedents and turnover behavior. Availability of alternatives plays a moderating role between job satisfaction and turnover. Except for the negative correlation between centralization of power and job satisfaction, the remaining four antecedents are positively related to job satisfaction. An employee's job satisfaction can significantly predict turnover behavior. Employees who are highly dissatisfied with their current work and have other job offers in hand will choose to quit. The major contribution of this model is that it combines individual and organizational variables and uses job satisfaction as the core mediating variable in the study of turnover.

#### (4) Price-Mueller Model

The Price-Mueller model was constructed based on Price (2001) turnover model, which consists of three assumptions: (1) employees enter an organization with certain expectations; (2) interest exchanges exist between employees and organization; and (3) employees tend to pursue the benefits maximization. The model is the representative of mainstream turnover models, which categorizes influencing factors of turnover into two types: external variables and internal mediating variable. Specifically, the external variables include environment variables, individual variables and structured variables, each of which are further subdivided and discussed separately. For example, the structure variables include seven constructs: work autonomy, distribution justice, work pressure, salary, promotion opportunities, work routinization, and organizational support. The internal mediating variables include job satisfaction and organizational commitment. The structured variables indirectly influence TI with job satisfaction and organizational commitment as mediating variables; job satisfaction and organizational commitment negatively affect the employees' behaviors of finding alternatives. The environment variables affect employees' TI and behavior in terms of finding other jobs.

#### (5) Lee-Mitchell Unfolding Model

Lee and Mitchell (1994) proposed an "unfolding" turnover model based on image theory, according to which the turnover decision is essentially an image-matching process with image compatibility test as the main standard.

Unlike traditional turnover models, which focus on job satisfaction, there are four paths leading to turnover. The unfolding model is anchored in a concept of “shocks to the system”<sup>1</sup>, defined as external events that have implications on work and further result in the relationship change between employees and organization such as major change of current situation of family. The shocks might have positive, negative, or no effect on the work relationship. Three of the four turnover paths are caused by shocking events.

Path 1: If an employee is shocked by external events, he/she will compare these events with things in his/her memory, such as previous relevant decisions, rules, and previous similar shocks. If the two match each other, the employee will take action based on previous experiences.

Path 2: After being rocked by shocks, employees will reassess their psychological attachment (or known as organizational commitment) to the organization based on their values and development tendency. If the assessment results are consistent with existing images in memory, they will stay with the organization. If the opposite occurs, the image is damaged and they will leave.

Path 3: After being shocked by external events, employees will match the unexpected events with their values, development tendency, and strategic images. If no match is found, they will grow dissatisfied with the work. Such dissatisfaction will lead employees to find or assess job alternatives or even choose to leave.

Path 4: After a period of time, employees will assess the organization’s commitment to them. If the new assessment results are in conflict with their values and career development, feelings of dissatisfaction will be stirred up among employees. This may have two implications: first, employees will choose to leave; second, employees continue to find or assess job alternatives before making decision to leave.

Contrary to most studies of turnover, which overly focus on job dissatisfaction, the unfolding model identifies the causes of turnover from other perspectives, which holds that there are multiple reasons for employee turnover, among which the implications of

sudden events on turnover should not be neglected (Wu, 2009).

### **2.4.3 Antecedents of TI**

Muchinsky and Morrow (1980) categorized antecedents of TI into three types: individual factors, work-related factors, and economic variables. The individual factors reflect the effect of demographic variables on turnover. The work-related factors reflect the influence of work and organization on employee turnover. The economic factors reflect the effect of macro economic environment and labor market on turnover. Zeffane (1994) argued that the antecedents of TI include external factors (such as unemployment rate and labor market), individual factors (work capabilities, working years, etc.), institutional factors (for example, organizational atmosphere, working conditions, and salary level), and employees' perceptions towards work (such as job satisfaction and work engagement). Iverson (1999) classified antecedents of TI into individual factors (gender, family conditions), work-related factors (support from leaders and coworkers, role ambiguity), external environment (work opportunities), and employee orientation (job satisfaction, organizational commitment). Fu, Ling, and Fang (2002) found that, in China, employees' salary, leaders' attitude, and opportunities for promotion and training have a great influence on TI.

According to the above-mentioned studies, the antecedents of TI can be classified into four types: (1) individual factors (demographic variables such as age and gender); (2) organizational factors, such as management mode, salary fairness, organizational justice, and POS; (3) person–organization fit factors, such as job satisfaction, organizational commitment; and (4) external factors such as macro-economic environment, industry environment, and labor market condition.

#### **(1) Individual factors**

Theoretical and empirical studies suggest that the personal characteristics of employees are related to their TI. Personal characteristics mainly include education background, age, and gender (Cotton & Tuttle, 1986; Mobley, 1982).

Mobley (1982) argued that employees' age, gender, and education background are closely related to TI (Cotton & Tuttle, 1986; Cui, 2003). Han (2008) confirmed that gender is an important influencing factor of turnover and the TI of male employees is stronger than that of females. Lin and Zhao (2014) also concluded the optimism is significantly and negatively correlated with TI; that is, the more optimistic an employee, the lower the TI.

## (2) Organizational factors

From organizational perspectives, the influencing factors of TI include organizational justice and POS.

Interviews and a questionnaire survey among 823 psychological counselors from drug rehabilitation center revealed a negative correlation between procedural fairness and outcome fairness on TI (Knudsen, Ducharme, & Roman, 2008). Fields, Pang, and Chiu (2000) noted that distributive justice can effectively predict TI. Jiang (2007) argued that distributive justice and procedural justice have significant negative effects on TI, with POS as the mediating variable. Yu, Yin, Huang, Sun, and Wei (2016) studied the relationship among salary fairness, job satisfaction and TI, and found that salary fairness has an important effect on job satisfaction and work stability among doctors in public hospitals and significant and a negative prediction on TI. Salary fairness reflects employees' feeling towards organizational justice and industry fairness, which can directly influence employee job satisfaction and further affect turnover.

POS can significantly and negatively predict TI (Rhoades & Eisenberger, 2002). Eisenberger, Stinglhamber, Vandenberghe, Sucharski, and Rhoades (2002) found that supervisor support is positively correlated with POS and that POS plays a mediating role between supervisor support and turnover behavior. By studying the effect of LMX difference on employees' altruistic behavior and TI based on structural equation modeling, Zhou, Shi, and Mo (2016) found that LMX difference is significantly and positively correlated with employees' perceived procedural justice and the perceived procedural justice affects employees' altruistic behaviors and TI; that is, the

greater the difference in procedural justice, the less altruistic behavior the employees have and the stronger the TI.

### (3) Person–organization fit

When an employee's values and working style are highly aligned with those of the organization, the employee can easily achieve high performance and experience high satisfaction and low pressure. In this regard, job satisfaction and organizational commitment have been heavily studied. Theoretical and empirical studies suggest that job satisfaction and organizational commitment is significantly and negatively correlated with employee turnover. According to Mobley's intermediary chain model and Price's job satisfaction model, job satisfaction plays a mediating role in predicting TI and employees with low satisfaction report high TI (Mobley, 1977; Price, 1977), and employees with lower job satisfaction have higher TI. By empirically studying 253 nursing staff in a hospital in Taipei, Teng, Lotus Shyu, and Chang (2007) found that organizational commitment has a significant effect on job satisfaction and that job satisfaction is a predictor of TI. Lambrou, Kontodimopoulos, and Niakas (2010) studied 208 health workers in Turkey and found that the organizational justice perceived by employees is more influential to TI, job satisfaction, and organizational citizenship behavior than envisaged by organization, and there is a significant negative correlation between job satisfaction, organizational citizenship behavior and TI. Zhou, Chen, and Yang (2012) argued that higher job satisfaction and more organizational citizenship behaviors can significantly reduce TI. Chen et al. (2012) sampled 1272 nurses from 19 hospitals in Beijing and found that nurses with low professional identity and job satisfaction and high working pressure have stronger TI. Job satisfaction plays a full mediating role between psychological capital and TI among medical staff. Optimism and hope – two dimensions of psychological capital – are significantly and negatively correlated with TI (Wu, Xu, Wang, Zhang, & Zhao, 2017).

Zeffane (1994) pointed out that a higher degree of P-O fit will lead to a higher level of organizational commitment among employees. Multiple studies have shown

that organizational commitment is significantly negatively related to employee TI (Bluedorn, 1982; Morris & Sherman, 1981). Su and Zhao (2005) confirmed that there is a significant negative correlation among organizational commitment, organizational citizenship behavior and TI. Liu and Quan (2016) conducted an empirical study of 500 doctors in 23 hospitals in Guangdong and confirmed that OC has an indirect effect on TI, while job satisfaction and self-expectation play a full mediating role between OC and TI. Bai, Ling, and Li (2011) pointed out that career plateau has negative effects on job satisfaction and organizational commitment and thus leads to increased employee TI; in addition, career plateau and job satisfaction have partial mediating effects on TI through organizational commitment.

Many studies have been conducted on the influence that job burnout has on TI. Research shows that long-term job burnout can easily lead to stronger TI (Maslach, Schaufeli, & Leiter, 2001; Price, 1977). Chinese scholars reached similar conclusions. Zhao and Li (2012) studied since the 1980s knowledge workers and concluded that job burnout has a positive predictive effect on TI. Sun et al. (2014) pointed out that higher job burnout of medical staff can significantly reduce their job satisfaction and increase TI. Using the multiple stepwise regression method, Yang and Zhang (2015) found the job burnout and depersonalization, two dimensions of emotional exhaustion, can effectively predict medical staff turnover; that is, the higher the level of job burnout, the higher the employee turnover.

#### (4) External environment

The influencing factors of employee turnover regarding the external environment mainly includes the political and economic environment. The turnover of nearly all employees is more or less affected by the macro environment (Zhen, 2011).

From the perspective of the macro labor market, March and Simon (1958) pointed out that when the labor market is in short supply, the turnover rate is higher than that when labor is in oversupply. Mobley (1982) argued that occupational characteristics are also important influencing factors of TI. Employees from different industries have

different perceptions towards their own labor market, which means that the effects of different labor markets on the TI are vastly different. Wang and Ye (2001) studied the influencing model of TI among high-tech employees in China and found that external factors such as labor market and industry life cycle can affect TI.

The correlation between DPR and TI has also been studied considerably, but the research conclusions are different. A survey of doctors in Fujian conducted by Lin et al. (2014) found that job satisfaction and workplace violent attack against doctors are behind TI. Moreno-Jimenez et al. (2012) found that strained DPR can lead to mental fatigue and job burnout and increased TI among medical staff. (Liang et al., 2014) concluded that a harmonious DPR can improve medical staff's job satisfaction and reduce their work pressure, job burnout, and negative feelings, thus reducing TI. Low trust of patients will make doctors experience high work pressure and mental fatigue, resulting in high TI (Liu, Wang, Qin, Deng, & Chen, 2015). However, other scholars view this differently. With the third-level grade A hospitals in Guangdong as research objects, Xu et al. (2014) discussed the effect of DPR and organizational commitment on the hospitals' core health professionals and concluded that DPR reflects the entire social environment. The resignation of doctors does not help the improvement of DPR unless they will no longer work as doctors. Therefore, the DPR has little influence on medical staff's TI.

Based on this literature review, the study summarized the influencing factors of employee TI from perspectives of individuals, organization, person-organization fit, and environment. The research results show employee turnover is a result of the interactions of four factors rather than any single factor (Zeng & Wang, 2015).

#### **2.4.4 Measurement of TI**

Most early studies measured TI using turnover rate and survival curve. To measure TI, many studies must first identify whether they are voluntary or involuntary, which makes it difficult to measure actual turnover. Therefore, the best way to measure

turnover is to measure TI(Xiao, 2015).

The TI scale developed by Mobley et al. (1978) has been widely used by foreign and Chinese scholars and measures employee TI from four aspects: employee's perceptions of his organization, thoughts of leaving, ways of seeking work elsewhere, and possibilities of finding a new job. The scale focuses on exploring the thinking process of employee turnover. The employees first self-assess their satisfaction with their current work. When satisfaction is low, TI arises.

Weng (2010) indigenized Mobley (1978)'s scale according to China's conditions and applied it in an empirical study. The scale includes four items, such as "I basically have no thought of leaving my current organization". The scale's internal consistency reliability is good and Cronbach's  $\alpha$  is 0.755.

The TI scale constructed by Michaels and Spector (1982) includes six items, which constitute three indicators of TI: the possibility of leaving the current job, the motivation to find another job, and the possibility of obtaining new work. The scale's connotation is in good agreement with that of Mobley (1978). After being translated and revised by Taiwanese scholar Li, the scale was used for Chinese employees. The revised scale has good reliability and Cronbach's  $\alpha$  is 0.773 (Li, 2000).

TI scale developed by Hong Kong scholar Farh has been widely used in China. The surveys based on the scale by Farh, Tsui, Xin, and Cheng (1998) show the scale has good internal consistency and test-retest reliability. Lin and Zhao (2014) used the scale to study the relationship between employees' optimistic spirit and TI and confirmed the scale's Cronbach's  $\alpha$  is 0.886 and its internal consistency is good.

#### **2.4.5 Research review of TI**

According to the above literature research, the concept of TI has been variously defined by different scholars and many exemplary TI models are proposed. The TI measurement and research on antecedents of TI have been actively researched and a series of important research results have been achieved. For example, scholars

universally agree that job satisfaction has a decisive effect on employee TI. However, further studies are still required. For example, TI among doctors has been insufficiently researched, while the effect of doctors' social support (DPR, for example) on TI from the perspective of LMX remains unclear. The research on outcome variables of TI is insufficient. In particular, the effect of doctor turnover on the health industry and the occupational attitude of medical staff remains scarce.

## **2.5 Conservation of resource theory**

The conservation of resource (COR) theory was first put forward by Hobfoll (1988) while studying pressure, which is based on the assumption that people always actively maintain, conserve, and build various kinds of valuable resources. Any actual or potential loss of such resources will pose a threat to a resource's possessors (Hobfoll, 1989). According to COR, people's main motivation is to save and build resources and when people lose a resource or face the prospect of losing it, or fail to get the desired resources after resource input, psychological pressure will arise. Therefore, apart from valuing the resources themselves, people also pay attention to which other resources they can acquire by using available resources.

### **2.5.1 Definition of resources**

Hobfoll (1989) defined resources as useful or valuable individual characteristics, conditions and abilities, or the way to help an individual to acquire these personal qualities. Generally, resources are divided into four types: material resources, individual resources, identity resources, and energy resources. Specifically, material resources refer to rare and expensive resources that can show an individual's socioeconomic status. Individual resources the individual characteristics, knowledge, and experience, such as personal traits and psychological resources that determine an individual's stress tolerance. Identity resources refer to key resources that can create opportunities for an individual, such as marriage, job title, and qualifications. Finally, energy resources refer

to resources that can help an individual acquire other resources, such as fame and reputation (Hobfoll, 1989).

Work resources refer to resources that can provide material, physical, psychological, social, and organizational support for employees in order to help them accomplish organizational goals, reduce their psychological and physiological costs, and ultimately promote their growth, which mainly includes interpersonal relationship, organization system, and personal resources (Bakker & Demerouti, 2007). Thus, sound DPR and LMX are regarded as valuable work resources.

### **2.5.2 Core ideas of COR theory**

The COR theory deals with resource consumption and gains and states that people are very sensitive to resources consumption; in order to prevent the consistent loss of resources, they must first invest in resources. Individuals with more resources are less vulnerable to the loss of resources than people with fewer resources, as they can find more opportunities to invest in resources and harvest other resources. However, in the process of avoiding the loss of resources and acquiring new resources, it is inevitable to consume and reduce the existing resources (Hobfoll & Shirom, 2001). When the resources are in danger of being lost, or have actually been lost, people with fewer resources tend to feel the pressure of resources loss. Although people attempt to prevent continued resource loss by investing in other current resources, the fact that invested resources cannot cover the lost resources will lead to the accelerating consumption of resources; this is often referred to as the “loss spiral effect”. By contrast, individuals with sufficient resources are willing to take risks and find more opportunities to invest and gain more resources. In such cases, the gains of resources are far greater than the input; this is known as “incremented spiral effect” (Cao & Xu, 2014).

The conservation of resources theory put forward by Hobfoll (2001) focuses on discussing how people cope with pressure in order to better adapt to the changing social environment from the perspective of the input-output imbalance of individual resources.

Specifically, the loss spiral effect occurs as people feel their resources are insufficient. When resource loss occurs, people will mobilize other resources to make up for the losses in order to cope with pressure and adapt to the circumstances. If there is excessive pressure or the lost resources cannot be effectively and timely supplemented, people will experience job burnout that can negatively affect them both physically and mentally (Hobfoll, 2002).

### **2.5.3 Principles of resources conservation**

(1) Priority principle: People do not feel the incremented spiral effect as easily as they feel the loss spiral effect. People who lack resources are more likely to suffer loss spiral effect. The same amount of losses and gains produce different psychological effects on people because they care more losses than gains. The pain caused by resources loss is greater than the happiness brought by the same amount of gains (Kahneman & Tversky, 1979). In other words, as the resource losses and gains are equal in amount, the former has more effect than the latter. Therefore, people's awareness of protecting resources is higher than that of gaining extra resources. When there is a loss of resources, people will adopt active strategies to prevent the loss of resources and avoid the occurrence of the loss spiral effect (Cao & Xu, 2014).

(2) Resource input principles: When the existing resources are guaranteed to be safe, people will take active measures to acquire more resources. Such efforts can help prevent the loss of resources and also improve the ability to endure risks; on the other hand, they can help create opportunities to gain more resources, thus achieving an incremental spiral effect. In the event of resource loss, people tend to adopt different strategies according to their actual resource conditions. When the resources are sufficient, the best strategy is to prevent the loss of resources (Liao & Yan, 2014; Wen & Hou, 2018). Therefore, the first thing people should do is not to input the newly acquired resources, but to choose the most suitable environment for the remaining resources so that they meet the environmental requirements. When the resources do not

match or the best strategy cannot be selected because of the depletion of the resources, the resource compensation strategy should be adopted and the additional resources can be used to meet the requirements of the environment. When the cost of input resources exceeds the expected benefits, the adaptive strategy will be adopted. In general, the following positive strategies can be adopted: (1) obtain and preserve resources as far as possible; (2) take active action and send early warning signals before the resources are threatened; (3) select the environment that suits their own characteristics so as to better adapt to the circumstances (Hobfoll, 2001).

## **2.6 Social exchange theory**

Social exchange theory originated in the United States in the 1950s, developed rapidly in the 1960s, and has become an important part of contemporary sociological theory. Social exchange theory holds that the interpersonal interaction is essentially a social exchange. According to the principle of reciprocity and fairness in social exchange, people who are given positive treatment will treat others kindly. Meanwhile, social exchange is restricted by social and cultural norms, which contains material and nonmaterial exchange.

### **2.6.1 Main contents of modern social exchange theory**

The main representatives of modern social exchange theory include Homans (1958) and Blau (1964). According to Homans' (1958) social behavior as exchange theory, the interaction between people is actually a kind of exchange aimed at pursuing the maximization of interests in a rational way. The American sociologist Blau (1964), based on Homans (1958), divided the social structure into micro and macro structures and expanded the research angle from the exchange of individuals to the exchange of both parties. He argued that, unlike economic exchange, social exchange can generate individual's obligation, trust, and gratitude, while social exchange is restricted by social and cultural norms. Based on the fairness principle, the social exchange is conducted

between two parties that are mutually beneficial. One party needs to pay the other party for the beneficial action on a voluntary basis. In social exchange, the reward behavior, social approval, and social recognition can be regarded as reward resources. Social exchange is a long-term behavior, while economic exchange is a short-term behavior based on cost-benefit analysis and the comparison of alternatives.

### **2.6.2 Social exchange theory and LMX**

Apart from explaining LMX based on role play, scholars have also interpreted LMX using social exchange theory. Due to the limited organizational resources and leaders' time and energy, leaders tend to treat their subordinates differently and classify them into in-group and out-group members. The in-group members are regarded as reliable and are therefore arranged in key posts. Their work tasks far exceed their contractual obligations and involve a large number of social exchange activities based on "mutual trust, respect and obligation" (Liden & Graen, 1980; Ren & Wang, 2005). According to social exchange theory, leaders maintain close relationship with members in the inner circle and both sides enjoy high-quality LMX. On one hand, leaders show more care and give more support and resources to in-groups, hoping they can work harder to achieve their effective leadership or contribute more to the realization of organizational goals. On the other hand, driven by a sense of obligation, trust, and gratitude, in-group subordinates will perform tasks more seriously than the out-group ones in order to gain leaders' approval and cognition and also achieve personal goals such as promotion and salary increase. However, it is difficult for out-group members to acquire these benefits from high-quality LMX. Therefore, LMX can be seen as social exchange. In this study, the good DPR and OC can be regarded as the resources acquired in social exchange as a doctor.

## 2.7 Hypotheses

### 2.7.1 Hypothesized relationship between LMX and DPR

According to LMX theory, in-group members receive more attention, trust, and respect from leaders and therefore feel highly motivated and maintain the good opinion of their managers. The in-group members and leaders form a solid exchange relationship based on “trust, gratitude and obligation”(Ren & Wang, 2005). Compared to the in-group members, members of the out-group do not receive any additional attention and have less access to the managers. With less support and motivation, the out-group forms a low-quality relationship with leaders. Therefore, subordinates enjoying high-quality LMX can gain more trust, guidance, resources, and opportunities from their superiors. In return, the subordinates will work harder. According to the literature review in this thesis, LMX is positively correlated with the subordinates’ positive attitudes and behaviors such as job satisfaction and organizational citizenship behavior (Gerstner & Day, 1997;Graen et al., 1982;Wang et al., 2005)and negatively correlated with negative attitudes and behaviors such as TI, job burnout, and reticent behavior (Gerstner & Day, 1997;Graen & Uhl-Bien, 1995;Huang et al., 2010;Zhou et al., 2011).

Job insecurity, as its name implies, means that an individual feels threatened in his/her workplace and has concerns about the future permanence or the perceived continuance of their job (Greenhalgh & Rosenblatt, 1984). Employees with job insecurity feel their resources are threatened, which reduces their work engagement and increases their TI (Zhang, Lin, & Zhang, 2013). According to the conservation of resources theory, the strained DPR will result in work pressure and job insecurity. When doctors sense their resources are under threat, they will consume other resources to protect existing resources. However, individuals with more resources are less likely to suffer a loss of resources, while people with more resource reserves can find opportunities to gain more resources by investing in other resources (Hobfoll & Shirom,

2001).

According to the social exchange theory, the LMX relationship among doctors is a transactional psychological contract, which is a two-way effort-reward process. When a doctor forms a good relationship with his supervisor, he can acquire more organizational resources, opportunities, and trust, thus enjoying high job satisfaction. This satisfaction can, in turn, increase the self-control ability and value identification of the doctor. Thus, the doctor is willing to put more resources into the organization. On one hand, doctors with more resources are less likely to suffer resources loss; on the other hand, even if there is resource loss, they can make up for the resources loss caused by tense DPR, which gives doctors more psychological safety and psychological support, thus effectively relieving stress and job insecurity, and improving the doctors' perception towards DPR.

As discussed above, the following hypothesis is put forward:

H1: LMX is positively correlated with doctors' perceived DPR.

### **2.7.2 Hypothesized relationship between LMX and OC**

Subordinates with high-quality LMX can obtain more trust, guidance, resources and opportunities. According to social exchange theory, subordinates who have more resources will work harder, enjoy higher job satisfaction and foster better AC and OC. A large number of studies have shown that LMX is positively correlated with job satisfaction (Gerstner & Day, 1997; Graen et al., 1982; Yu, 2014). Meyer et al. found that job satisfaction is positively correlated with AC and NC of OC (Irving et al., 1997; Meyer et al., 1993). The job satisfaction of Chinese medical and nursing staff is positively related to OC (Tang et al., 2008; Yan et al., 2015). An empirical survey of 302 Korean Airlines employees by Han, Kang, Yeoun-Kyung, Yoon, and JiHwan (2015) suggested that LMX has a positive effect on OC.

As discussed above, the following research hypothesis is proposed:

H2: There is a positive correlation between LMX and doctors' OC.

### **2.7.3 Hypothesized relationship between LMX and TI**

Subordinates with high LMX can acquire more resources and opportunities from leaders. According to COR and social exchange theory, subordinates with sufficient work and psychological resources can more easily handle stressful situations in work and interpersonal relationship(Huang et al., 2010)and thus develop positive attitude and behaviors such OCB and high job satisfaction(Gerstner & Day, 1997;Graen et al., 1982;Wang et al., 2005)and reduce negative attitude and behaviors such as TI,job burnout, and reticent behavior (Gerstner & Day, 1997;Graen & Uhl-Bien, 1995;Huang et al., 2010;Zhou et al., 2011).

High-quality LMX can positively affect job satisfaction and has a significant negative impact on turnover rate (Gerstner & Day, 1997). Harris et al. (2005)showed that the relationship between LMX and TI is curvilinear rather than linear. The better the quality of LMX is, the lower the TI is. Once a tipping point has been reached, the LMX quality will positively correlate to TI.According to Zeng (2012b), LMX can negatively affect TI and AC plays a moderating and mediating role between the LMX and TI.

As discussed above, the following research hypothesis is proposed:

H3: There is a negative correlation between LMX and doctors'TI.

### **2.7.4 Hypothesized relationship between DPR and OC**

Bakker and Demerouti (2007) argued that interpersonal relationships can be regarded as work resources. The DPR essentially represents a kind of interpersonal relationship. A good DPR helps improve patient compliance, treatment outcome, patient satisfaction, and patient's health, and also reduces medical costs (Di et al., 2001), thus enhancing medical staff's sense of professional achievement.Therefore, a good DPR can be viewed as a work resource of medical staff. Work resources are key influencing factors of doctors'OC(Huang & Yin, 2014). A good DPR shows that there are fewer conflicts between doctors and patients, which can not only bring positive

treatment outcomes to patients, but also reflect the work value of medical staff. Chinese hospitals are currently witnessing frequent occurrences of *Yinao*, violence against doctors, and even killing of doctors, which show that the DPR in China is tense and strained. A tense DPR suggests that medical staff in China lack work resources and suffer from anxiety and stress. Meanwhile, a difficult DPR also affects medical staff's job burnout and confidence in career development (Baker et al., 2003; Li, Gao, & Feng, 2006; Moreno-Jimenez et al., 2012; Tan et al., 2016; Xu, 2014).

According to COR and the resources input principle, when the existing resources are guaranteed to be safe, people will take active measures to acquire more resources. Such efforts can help prevent loss of resources and meanwhile improve ability of risk tolerance; on the other hand, they can help create opportunities to gain more resources thus achieving incremented spiral effect. A good DPR can bring medical staff more psychological resources and psychological support. According to the social exchange theory, the more resources medical staff can get, the higher the OC.

The impact of the DPR on medical staff has been confirmed. A positive DPR can positively affect the work engagement and work enthusiasm of medical staff (Chu, 2013; Dong & Proochista, 2012; Meng et al., 2014). The DPR is related to doctors' job burnout and TI (Mo et al., 2015; Moreno-Jimenez et al., 2012). There is a positive correlation between doctors' DPR satisfaction and nurses' professional identity (Dong & Proochista, 2012; Li, 2013; Mo et al., 2015; Wang, 2015). Occupational stress is related to OC (Lee et al., 2000), and work safety is an important predictor of OC (Goulet & Singh, 2002). Qin et al. (2015) argued that the DPR affects the doctor's OC. The social support of doctors and primary school teachers is positively correlated with affective commitment and normative commitment of OC, but is not related to continuance commitment (Zhang, 2015), and the social support of high school teachers is also significantly correlated with OC. Support from students, students' parents, school leaders, colleagues, and friends was able to significantly predict high school teachers' affective commitment, normative commitment, and cost commitment, but had

no significant effect on opportunity commitment, of which the students' support has the biggest effect on high school teachers (Liu, 2012). As special knowledge-based professional groups, teachers and doctors are required to have high professional ethics, and parents and patients are their main objects of service, respectively. The empirical study shows that social support from students and parents has a significant effect on teachers' OC(Liu, 2012). The DPR, which is similar to the social support from students and parents for teachers, can also affect the doctor's OC.

As discussed above, the following research hypothesis is proposed:

H4: There is a negative correlation between DPR and doctors' OC.

### **2.7.5 Hypothesized relationship between DPR and doctors'TI**

According to COR, a good DPR brings medical staff more psychological safety and psychological support, thus improving their work engagement and job satisfaction. Meanwhile, a good DPR can help medical staff to reduce psychological resources input and mental consumption and improve job satisfaction. Several studies have confirmed that job satisfaction is the antecedent variable of TI (Mobley, 1977;Price, 1977).Teng et al. (2007), based on survey of nursing staff in Taipei, China, also confirmed that job satisfaction could predict TI. Chinese doctors' perceived DPR has a significant negative impact on TI, while job satisfaction plays a mediating role between DPR and TI (Mo et al., 2015). Dong et al. (2013) also confirmed that DPR can significantly affect doctors' TI.

As discussed above, the following research hypothesis is proposed:

H5: There is a positive correlation between DPR and doctors'TI.

### **2.7.6 Hypothesized relationship between LMX and OC,TI, with DPR playing a mediating role**

According to COR and social exchange theory, doctors with high-quality LMX can get more resources and properly handle DPR; meanwhile, doctors with more

resources are good at planning resources and continuously input resources in order to resist greater risks. Even if resource consumption occurs, they can offset such loss caused by tense DPR in a timely manner. A harmonious DPR can bring more psychological safety and support to doctors, thus improving their work engagement, job satisfaction and reducing TI. LMX is an organizational resource, while the DPR is a psychological resource of job accomplishment. From the perspective of social exchange theory, LMX as an organizational resource can affect the DPR, while the DPR can affect job satisfaction in the form of a reasonable degree of doctor turnover. Therefore, it can be speculated that DPR plays an intermediary role between LMX and TI.

Doctors derive their job satisfaction from the professionalized special service that is developed on the basis of good DPR (Hellin, 2002). A good DPR not only constitutes the foundation of the improvement of diseases for patients, but also allows doctors to realize their occupational values in terms of saving lives. In this sense, a good DPR is a psychological resource of self-realization in the career development of doctors. According to the social exchange theory, higher-quality LMX enables doctors to embrace more resources at the organizational level; better DPR indicates that doctors could get access to more psychological resources of self-realization in their job and thus promoting their OC. In this respect, it can be concluded that DPR plays an intermediary role in the relationship between LMX and the OC of doctors.

According to the above hypothesis, LMX is positively correlated with the DPR, while the DPR is positively related to OC and is negatively related to TI. A large number of empirical studies confirm that LMX is positively correlated with employee job satisfaction (Graen et al., 1982; Yu, 2014). Job satisfaction is positively correlated with OC (Irving et al., 1997; Meyer et al., 1993) and negatively correlated with TI (Gerstner & Day, 1997). The job satisfaction of Chinese medical staff positively correlates to DPR (Ma et al., 2017).

As discussed above, the following hypotheses are put forward:

H6: DPR plays a mediating role between LMX and the OC of doctors.

H7: DPR plays a mediating role between LMX and the TI of doctors.

According to the above hypotheses, the research model in this study is constructed as depicted in Figure 2-2:

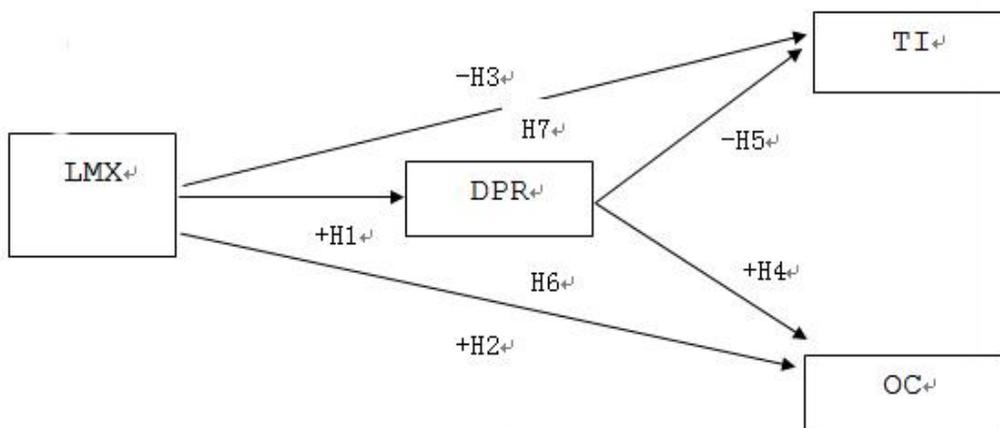


Figure 2-2 Research model

## **Chapter 3: Research Methods**

In order to obtain objective and reliable research results, the quantitative method is used to carry out the questionnaire design and data collection. Meanwhile, the scale items are tested using exploratory and confirmatory factor analysis and common method variance.

### **3.1 Questionnaire survey**

The questionnaire survey method is used in this study to collect data and the questionnaires are sent out and completed by respondents. The format of the questionnaire is based on a typical six-point Likert scale, with categories 5–6 representing “agree” and “completely agree”, 3–4 representing “somewhat disagree”, “somewhat agree”, and 1–2 representing “totally disagree” and “disagree”.

#### **3.1.1 DPR questionnaire design and measurement**

In this study, the DPR is measured using self-made doctor-specific DPR scale (Zeng, Ma, & Gou, 2018). In the process of questionnaire design, the research methods such as literature review, expert interviews, and questionnaire modification are used.

(1) Literature review. The literature review was conducted to clarify the connotations of DPR-related variables, based on which the DPR-related measurement scales are selected.

(2) Expert interview. On the basis of the literature review and expert interviews and in strict accordance with questionnaire design procedure, the items of doctor-based questionnaire were initially developed.

(3) Questionnaire modification. In order to develop scale items that can be well-suited to doctors and make language expression more clear and easy to understand, the

expressions of some scale items were further modified and polished.

According to China’s actual conditions, the study developed a doctor-based DPR scale to be used in the Chinese context. This scale under went the following processes. First, a semi-structured questionnaire survey was conducted among 21 medical experts from eight third-grade general hospitals in Beijing, Guangdong, Jianxi, and Guangxi, and 20 questionnaire items were initially built. Second, from June to July 2017, the pilot questionnaire surveys based on the initial scale items were conducted among four third-level Grade-A hospitals: the Fourth Affiliated Hospital of Guangxi Medical University, Liuzhou Maternal and Child Healthcare Hospital of Guangxi, Jiangxi People’s Hospital, and the First Affiliated Hospital of Jiangxi Nanchang University; 162 valid questionnaires were retrieved. After conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), two factors with eigenvalues greater than 1 were extracted. Third, the generality and validity of the DPR questionnaire was further testified. The questionnaire survey was conducted among around 3000 doctors participating in the Summit Forum of China Resident Standardization Training in September 2017. A total of 1971 valid questionnaires were collected and these were sorted into eight sample groups according to hospital classification level and type. After EFA and CFA and validity test, the self-made DPR scale in this study shows good validity and reliability. The development process of the DPR scale is shown in Figure 3-1.

The final scale consists of two dimensions: “Doctor–patient trust” (four subitems) and “patient-centered treatment” (five subitems). See details in Table 3-1.

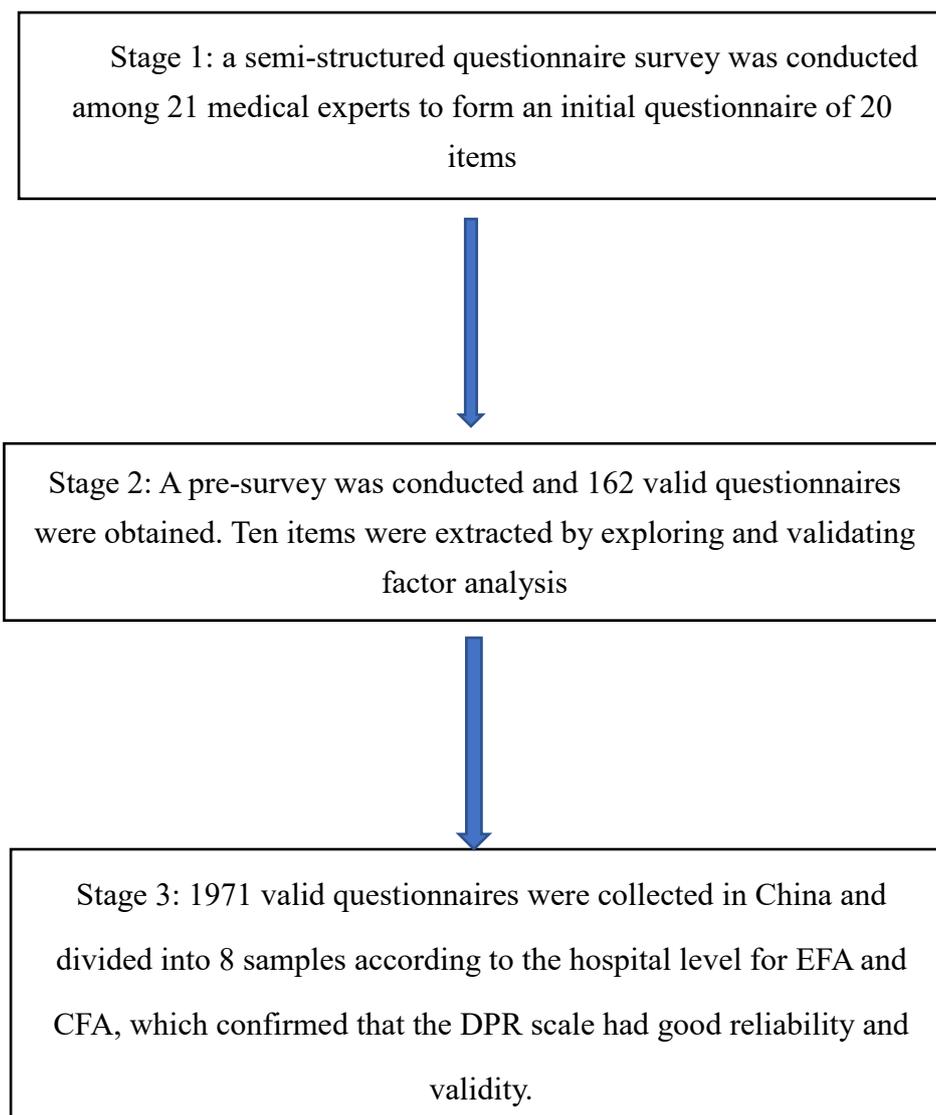


Figure 3-1 The development process of the DPR scale

Table3-1 DPR scale

Item	disagree Totally	Disagree	disagree Partially	agree Partially	Agree	Completely agree
DPR1.Patients trust that you will put their treatment needs first.	1	2	3	4	5	6
DPR 2.Patients have confidence in your treatment plan.	1	2	3	4	5	6
DPR 3.Patients are willing to follow your treatment plan.	1	2	3	4	5	6
DPR 4.Patients trust that the physical examinations you prescribe are necessary.	1	2	3	4	5	6
DPR 5. You always tell patients about the risks potentially caused by treatment plan.	1	2	3	4	5	6
DPR 6. You always help patients and their families wholeheartedly.	1	2	3	4	5	6
DPR 7. You always provide patients with the best treatment plan after comparing alternatives.	1	2	3	4	5	6
DPR 8.You are proud that your professional skills can help cure patients.	1	2	3	4	5	6
DPR 9.You are very happy to receive patients for return visits.	1	2	3	4	5	6

### 3.1.2 LMX measurement

In this study, LMX is a single-dimension construct referring to the exchange relationship between leaders and subordinates. The LMX-7 scale proposed by Scandura and Graen (1984) is used in this study, including seven items such as “I have maintained good work relationship with my supervisor”. The scale was translated into Chinese by Wang et al. (2004) and is used in the Chinese context. After changing the word “supervisor” to “leader” in Wang’s scale items, the translated scale is directly used in this study. See details in Table 1 of Appendix II.

### **3.1.3 OC measurement**

The study adopts the definition of OC proposed by Blau (1985), who argued that OC refers to an employee’s feelings and attitude towards a career and desire to remain in his/her current profession. Affective commitment is core content of organizational commitment. Therefore, the “affective commitment” dimension in Blau (2003) four-dimension OC scale is extracted to form the OC scale in this study. The scale was used by Pei et al. (2007) among nurses in China. The Cronbach’s  $\alpha$  in Pei’s study is 0.89, which suggests the scale has good reliability. In the present study, the word “nurse” in Pei’s scale is changed to “doctor” or “health service”. The OC scale in this study includes six items, such as “I feel glad to be a doctor”; see Table 2 in Appendix II.

### **3.1.4 TI measurement**

The study adopts the definition of TI proposed by Mobley et al. (1978), who argued that TI refers to the mental state of employees after experiencing turnover thought, job hunting, and comparison of other job alternatives. TI is the last step before the actual turnover behavior occurs. TI scale in this study is based on Rosin and Korabik (1991) scale, which was used by Jiang (2007) in the Chinese context. The word “company” in Jiang’s TI scale has been changed to “hospital” in the present study and the TI scale has four items, including “I have the thought of leaving the hospital”; see Table 3 in Appendix II.

### **3.1.5 Control variables**

In this study, gender, age, marital status, education background, doctor type, professional title, post, department classification, length of service, and working years in the surveyed hospital were selected as the control variables. For example, the types of doctors include clinicians, doctors in supporting departments, and others (such as administrative staff). See Questionnaire 1 in Appendix I.

### **3.2 Basic information of surveyed hospital and data collection**

The Fourth Affiliated Hospital of Guangxi Medical University is a third-level Grade-A comprehensive hospital with 2500 beds and 3200 employees, 900 of whom are doctors. In 2017, it ranked among China’s top 100 hospitals in terms of the number of beds. Annually it receives 1.6 million outpatient visits and 100,000 hospitalized patients and carries out 50,000 operations. The research lasted from September to December 2017 and 10 specialist secretaries were selected as investigators. The questionnaire survey was conducted in the Fourth Affiliated Hospital of Guangxi Medical University on two occasions. Prior to the questionnaire surveys, the investigators received training regarding the survey principles and procedures. They were also informed that the survey should be carried out on a voluntary basis and that respondents’ information must be kept confidential.

In the first survey focusing on DPR and OC, 460 questionnaires were randomly distributed and 431 valid questionnaires were recovered (see Questionnaire 1 in Appendix I). According to the codes of the first batch of questionnaires and job number of respondents, the second survey, which focused on LMX and TI, was anonymously conducted among 431 doctors whose questionnaire responses in the first survey were valid (see Questionnaire 2 in Appendix I). The data collected from the two surveys were matched according to the respondents’ department classification and the posts. Finally, 381 valid questionnaires were retrieved, with the recovery rate being 82.8 percent.

### **3.3 Quality control**

The collected data were inputted and cross-checked by two research team members to prevent human error and missing data and to handle outliers.

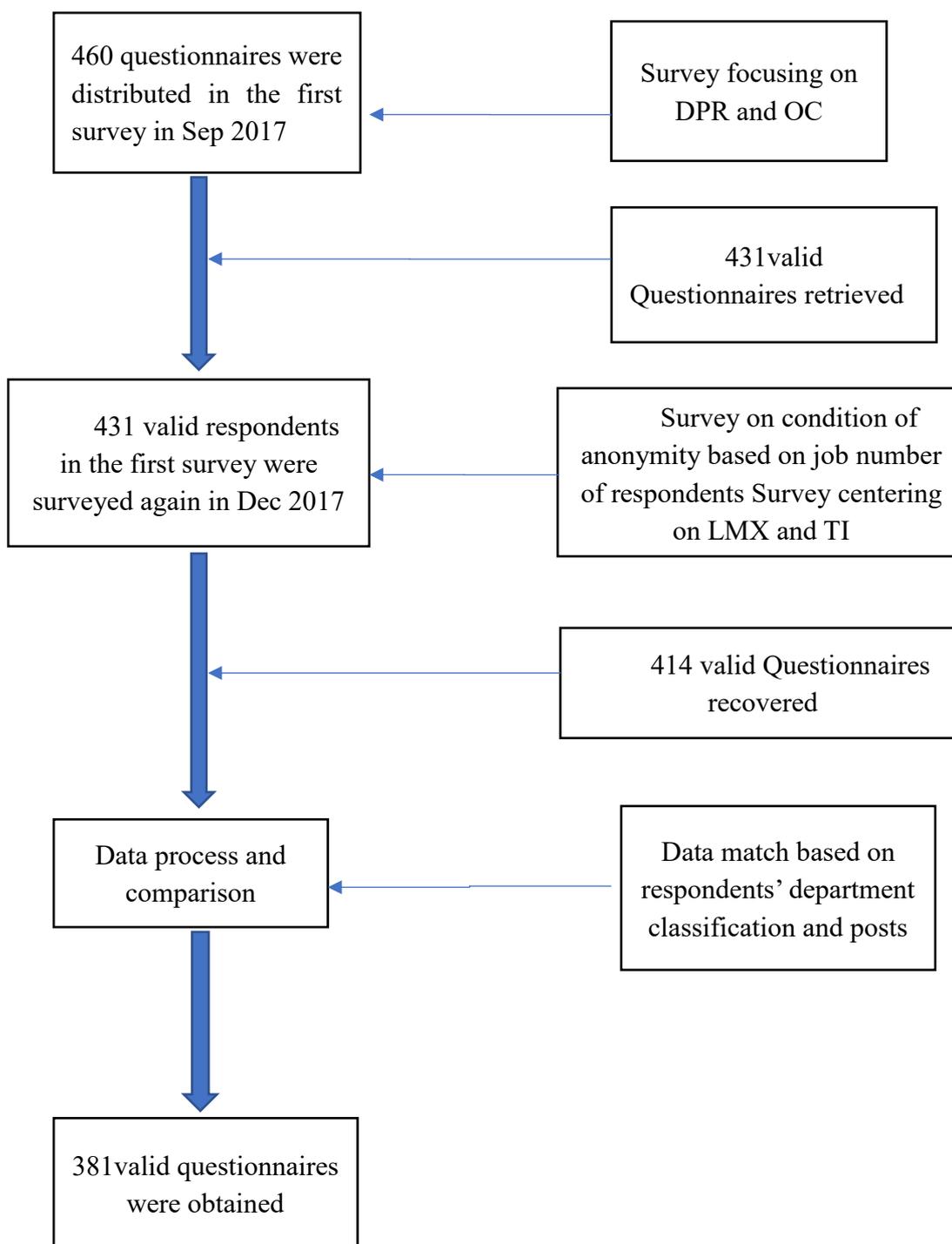


Figure 3-2 Data collection process

### 3.4 Statistical methods

This part introduces the statistical methods used in the study. The collected data are analyzed statistically using SPSS20.0 and AMOS17.0 software. Because the four variables involved in this study are all latent variables, the structural equation model

(SEM) is used to test the relationship between these variables. Specifically, SPSS20.0 is mainly used for statistical analysis, EFA, correlation analysis, independent sample T test and variance analysis. AMOS17.0 is mainly used for CFA and SEM.

### **3.4.1 Questionnaire reliability analysis**

Reliability refers to whether, if the testing process was repeated with the same test-taker under consistent conditions, similar results would be produced. The reliability analysis methods include the coefficient of internal consistency, test-retest reliability, alternate-form reliability, and split-half reliability. The study adopts the coefficient of internal consistency (also known as Cronbach's  $\alpha$ ) to test scale reliability. The higher the Cronbach's  $\alpha$ , the higher the consistency of measured variables in a group and the higher the reliability. When the Cronbach's  $\alpha$  of a scale is higher than 0.7, the scale has good reliability; when  $0.35 < \text{Cronbach's } \alpha < 0.7$ , the reliability is acceptable; when  $\text{Cronbach's } \alpha < 0.35$ , the reliability is low (Rong, 2010).

### **3.4.2 Validity analysis**

Validity is the extent to which a measurement is well-founded and likely corresponds accurately to the real world. Validity is classified into face validity, content validity, and construct validity. The factory analysis is commonly used to test the scale validity. The higher the validity coefficient, the more it can measure what it is supposed to measure. However, before factor analysis is conducted, a precondition must be satisfied; namely, there must be a strong correlation between measured variables. In addition, two principles must be followed: (1) when the Kaiser-Meyer-Olkin (KMO)  $< 0.6$ , factor analysis is not preferred; when  $0.6 < \text{KMO} < 0.7$ , factor analysis is preferred; when  $0.7 < \text{KMO} < 0.8$ , factor analysis is highly preferred; when  $\text{KMO} > 0.9$ , factor analysis is perfectly preferred. (2) The Bartlett test is used to measure the coherence of a set of variables. As  $P < 0.05$ , factor analysis is preferred (Zhou, 2017).

The EFA and CFA are used to test the construct validity of the questionnaire

scale. The measurement criterion is that when  $KMO > 0.7$ , the factor loading of items is greater than 0.4 and the proportion of cumulative variance explained by extracted factors whose eigenvalue is greater than 1 is not less than 60 percent, which indicates that the construct validity of the scale is better (Wu, 2003; Zhou, 2017).

### **3.4.3 Descriptive statistical analysis**

The demographic profiles of doctors mainly include gender, education background, age, and working years. The descriptive statistical analysis in this study is concerned with the mean value, standard deviation, extreme value, skewness and kurtosis regarding these demographic variables.

### **3.4.4 Analysis of correlation between measured variables**

Correlation analysis is used to measure the strength of the association between measured variables. According to the Pearson's correlation analysis in this study, the greater the absolute value of correlation coefficient, the stronger the correlation between measured variables.

### **3.4.5 Independent sample T-test and One-way ANOVA**

The independent sample T-test is used to analyze the differences among groups with different marital status and gender. One-way ANOVA is conducted for the differences among groups with different professional technical titles and age. Multiple comparisons are carried out by the least significant difference (LSD) method to test their influence on each research variable.

### **3.4.6 SEM analysis**

SEM is a blend of multivariate statistical methods, ranging from path analysis and factor analysis to linear regression analysis. Based on SEM theory, various models can be estimated and verified, and the measurement errors of variables are allowed, so both

discrete and continuous data can be applied. Therefore, it can greatly improve the accuracy of the study. The criteria for evaluating the fitting degree of the SEM in this study are based on the standards proposed by Rong (2012): Chi-Square( $X^2$ )/ degree of freedom (df) $<5$ , root mean square error of approximation(RMSEA) $<0.1$ , root mean square residual (RMR) $<0.05$ , goodness of fit index(GFI), adjust goodness of fit index(AGFI) $>0.9$ , normal fit index (NFI), comparative fit index(CFI), and incremental fit index(IFI)are expected to be closer to 1.

### **3.5 Questionnaire reliability and validity**

The rationality of test items and how much the respondents understand these items can affect the statistical results and ultimately lead to questionable research results. Therefore, in order to ensure the questionnaire design is effective and scientific, the factor analysis is used to continuously modify the deficiencies of questionnaire. CFA is carried out first, followed by EFA, and then CFA to finalize the scale items.

#### **3.5.1 DPR scale reliability and validity analysis**

According to the DPR CFA results shown in Figure 3-3, the factor loading of measured items is greater than 0.5. However the fitting degree of the DPR model, as seen in Table 3-2, is not satisfactory.

Before conducting EFA analysis of the DPR scale, KMO and Bartlett tests were conducted. According to Table 4 in Appendix II, the KMO is 0.847 and  $\chi^2$  reaches a significant level ( $P < 0.001$ ), so it can be judged that data is suitable for EFA analysis.

Principal component analysis is used to conduct EFA analysis of the DPR scale. According to the EFA results in Table 5 of Appendix II, two factors whose eigenvalue is greater than 1 are extracted and the principal factor cumulative variance explained is 70.054 percent ( $>60$  percent). According to the contents of the items involved in the DPR scale, the two principal factors are named “doctor–patient trust” and “patient-centered treatment”. Table 3-3 shows that except for item DPR5, factor loading of all

other items is greater than 0.7. The factor load of DPR5 is close to 0.7, which shows that the scale has good convergent validity.

Based on the above analysis, the DPR model needs to be further modified. The covariation relationships are established between residuals with covariant relations. The results show the modification index (MI) is 30.1 between residual e4 (DPR4) and residual e3(DPR3) and 15.98 between residual e4 (DPR4) and residual e2(DPR2); the MI scores between residual e5 (DPR5) and residual e9 (DPR9) and residual e6 (DPR6) are 21.85 and 11.17, respectively. The large MI between these items indicates that the differentiation between them is poor; therefore, DPR4 and DPR5 are deleted. The factor loading of items is greater than 0.6 (see Figure 3-4). According to Table 3-2, the model fitting degree is significantly improved after model modification and various measured index values have met the standards set by the study. Therefore, the DPR scale passed the test.

The reliability analysis results of the formal DPR scale are shown in Table 3-4. The table shows that the overall Cronbach' s  $\alpha$  value of the DPR scale is  $0.844 > 0.7$ , indicating that the scale's internal consistency is good and the reliability is high. The CITC of the seven items is greater than 0.5. If any of the items is deleted, the Cronbach' s  $\alpha$  will be lower than the overall value of the original scale, so all the items should be retained.

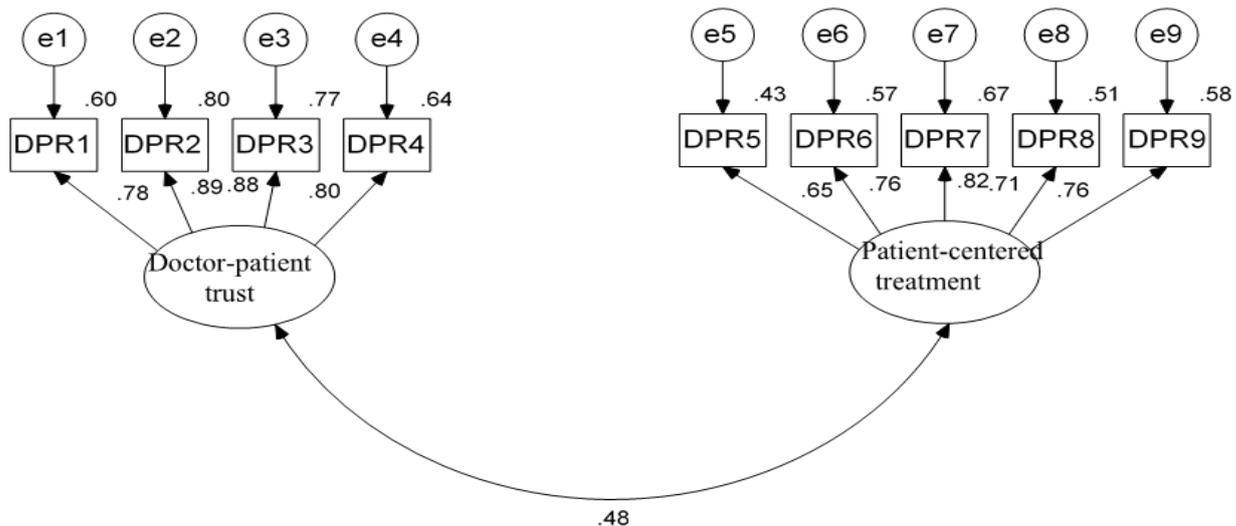


Figure 3-3 DPR constructs based on CFA

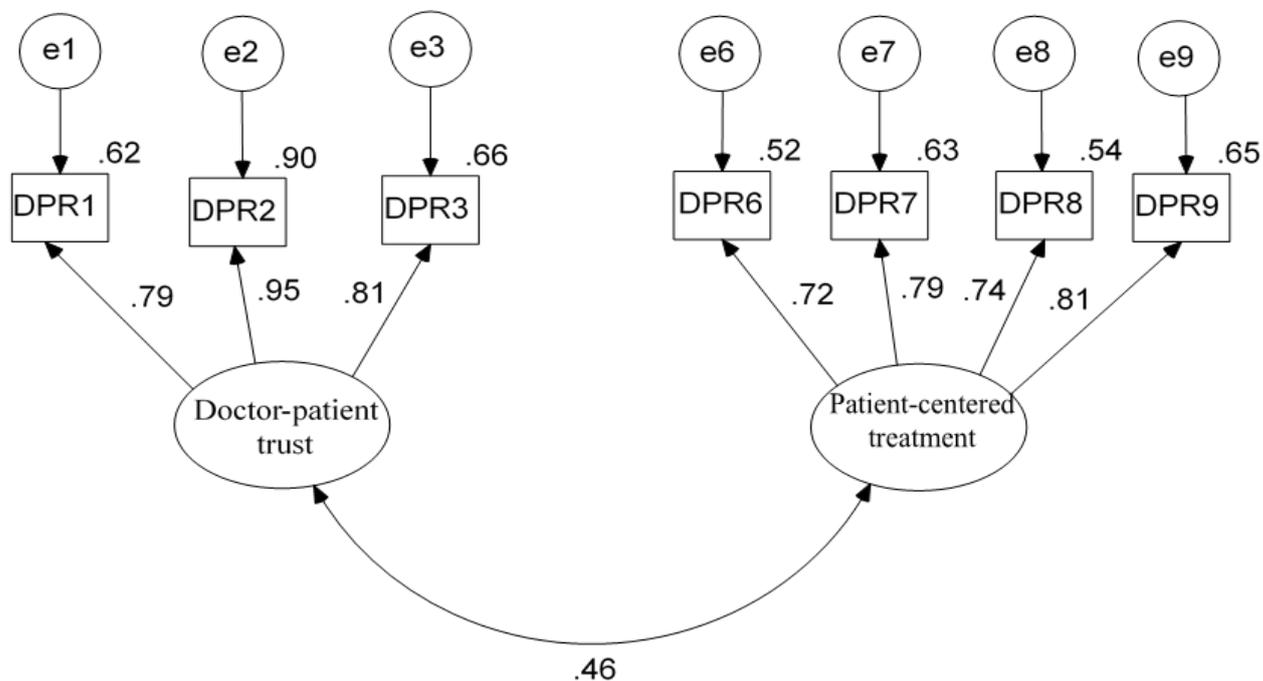


Figure 3-4 DPR constructs based on CFA (modified model)

Table 3-2 Evaluation index for DPR model fitting degree  
(Data comparison before and after model modification)

Evaluation index	Desired value	Measured value	Fitting degree	Measured value after model modification	Fitting degree after model modification
X <sup>2</sup> /df	<5, <3(preferably)	X <sup>2</sup> /df=5.927 (X <sup>2</sup> =154.108, df=26)	Poor	X <sup>2</sup> /df=3.699, (X <sup>2</sup> =48.083,df =13)	Good
RMR	<0.05	0.028	Very good	0.023	Very good
AGFI	>0.9	0.855	Acceptable	0.925	Very good
GFI	>0.9	0.916	Very good	0.965	Very good
RMSEA	<0.1,<0.0 5(preferably)	0.114	Poor	0.084	Good
NFI	>0.9	0.922	Good	0.966	Very good
IFI	>0.9	0.935	Good	0.975	Very good
CFI	>0.9	0.934	Good	0.975	Very good

Table 3-3 Factor loading of DPR scale (factors rotated)

Item	Component	
	1	2
DPR1	.272	.789
DPR2	.218	.884
DPR3	.118	.907
DPR4	.191	.842
DPR5	.698	.205
DPR6	.775	.227
DPR7	.840	.149
DPR8	.789	.111
DPR9	.782	.211

Table 3-4 CITC and reliability analysis of formal DPR scale

Item	Mean if Item Deleted	Variance if Item Deleted	(CITC)	Cronbach' s $\alpha$ if Item Deleted	Cronbach' s $\alpha$
DPR1. Patients believe you will place their treatment needs first.	31.67	9.569	.670	.813	
DPR2. Patients have confidence in your treatment plan.	31.68	9.791	.699	.806	
DPR3. Patients are willing to follow your treatment plan.	31.81	10.124	.596	.825	
DPR6. You always help patients and their families wholeheartedly.	31.15	11.426	.569	.828	.844
DPR7. You often provide patients with the best treatment plan after comparing alternatives.	31.11	11.651	.574	.829	
DPR8. You are proud to have medical skills to cure patients.	31.17	11.449	.526	.833	
DPR9. You are very happy to receive patients for return visits.	31.20	11.063	.617	.821	

### 3.5.2 LMX scale reliability and validity analysis

According to the LMX CFA results shown in Figure 1, the factor loading of measured items is greater than 0.6. However, the fitting degree of DPR model as seen in Table 3-5 is not satisfactory.

Before EFA analysis of the LMX scale is conducted, KMO and Bartlett tests are conducted. According to Table 6 in Appendix II, KMO is 0.898, and  $\chi^2$  reaches a significant level ( $P < 0.001$ ), so it can be judged that data is suitable for EFA analysis.

According to the EFA results in Table 7 of Appendix II, we can see that one factor whose eigenvalue is greater than 1 is extracted, and the principal factor cumulative variance explained is 66.845 percent ( $> 60$  percent). The factor loading of items 1-7 is 0.81, 0.81, 0.89, 0.83, 0.86, 0.77, and 0.75, respectively (all  $> 0.7$ ), which shows that

the scale has good convergent validity.

The above analysis indicates that the LMX model requires further modification. The covariation relationships are established between residuals with covariant relations. The items with large MI, such as LMX4, LMX6, and LMX7, are deleted. The factor loading of all items is greater than 0.7 (see Figure 2 in Appendix II). According to Table 3-5, the model fitting degree is significantly improved after model modification and various measured index values have met the standards set by the study. Therefore, the LMX scale passed the test.

Table 3-5 Evaluation index for LMX model fitting degree  
(Data comparison before and after model modification)

Evaluation index	Desired value	Measured value	Fitting degree	Measured value after model modification	Fitting degree after model modification
X <sup>2</sup> /df	<5, <3 (preferably)	X <sup>2</sup> /df=9.249 (X <sup>2</sup> =129.486, df=14)	Not Good	X <sup>2</sup> /df=4.175, P=0.015 (X <sup>2</sup> =8.351, df=2)	Good
RMR	<0.05	0.040	Very Good	0.016	Very Good
AGFI	>0.9	0.821	Poor	0.949	Good
GFI	>0.9	0.910	Good	0.990	Very Good
RMSEA	<0.1, <0.05 (preferably)	0.147	Not Good	0.091	Good
NFI	>0.9	0.927	Good	0.991	Very Good
FI	>0.9	0.934	Good	0.993	Very Good
CFI	>0.9	0.934	Good	0.993	Very Good

The reliability analysis results of the formal LMX scale are shown in Table 8 of Appendix II. The table shows that the overall Cronbach's  $\alpha$  of the LMX scale is 0.889, which is greater than 0.7, indicating that the scale's internal consistency is good and the reliability is high. The CITC of the seven items is more than 0.7. If any of the items was deleted, the Cronbach's  $\alpha$  would be lower than the overall value of the original scale, so all the items should be retained.

### 3.5.3 OC scale reliability and validity analysis

According to the CFA results shown in Figure 3 of Appendix I, the factor loading of measured items is greater than 0.7. However, the fitting degree of OC model, as seen in Table 3-6, is not satisfactory.

Before conducting EFA analysis of OC scale, KMO and Bartlett tests are conducted. According to Table 9 in Appendix II, KMO is 0.903, and  $\chi^2$  reaches a significant level ( $P < 0.001$ ), so the data can be judged as suitable for EFA analysis.

According to the EFA results in Table 10 of Appendix II, we can see that one factor with an eigenvalue greater than 1 is extracted, and the principal factor cumulative variance explained is 78.695 percent ( $> 60$  percent). The factor loading of items 1-6 is 0.89, 0.90, 0.92, 0.89, 0.90, and 0.83 respectively ( $> 0.8$ ), which shows that the scale has good convergent validity.

Based on the above analysis, the OC model needs to be further modified. The covariation relationships are established between residuals with covariant relations. The results show that the MI between residual e2 (OC2) and e1, e3, e5, e6 are 16.2, 15.28, 27.53 and 12.30 respectively; the MI between residual e3 (OC3) and e6 is 14.63. The large MI between these items indicates the differentiation between them is poor. Therefore, OC2 and OC3 are deleted. The factor loading of all items is greater than 0.8 (see Figure 4 in Appendix II). According to Table 3-6, the model fitting degree is significantly improved after model modification ( $P = 0.5 > 0.05$ ) and various measured index values have met the standards set by the study. Therefore, the OC scale passed the test.

The reliability analysis results of the formal OC scale are shown in Table 11 of Appendix II. The table shows that the overall Cronbach's  $\alpha$  of the OC scale is  $0.912 > 0.7$ , indicating that the scale's internal consistency is good and the reliability is high. The CITC of the seven items is more than 0.7. If any of the items is deleted, the Cronbach's  $\alpha$  will be lower than the overall value of the original scale, so all the items should be retained.

Table 3-6 Evaluation index for OC model fitting degree  
(Data comparison before and after model modification)

Evaluation index	Desired value	Measured value	Fitting degree	Measured value after model modification	Fitting degree after model modification
X <sup>2</sup> /df	<5,<3 (preferably)	X <sup>2</sup> /df=12.767 (X <sup>2</sup> =114.903,df=9)	Poor	X <sup>2</sup> /df=0.694 (X <sup>2</sup> =1.387,df=2)	Very Good
RMR	<0.05	0.029	Very Good	0.005	Very Good
AGFI	>0.9	0.775	Poor	0.991	Very Good
GFI	>0.9	0.904	Good	0.998	Very Good
RMSEA	<0.1,<0.05 (preferably)	0.176	Poor	0.000	Very Good
NFI	>0.9	0.947	Good	0.999	Very Good
IFI	>0.9	0.951	Very Good	1.000	Very Good
CFI	>0.9	0.951	Very Good	1.000	Very Good

### 3.5.4 TI scale reliability and validity analysis

According to the CFA results shown in Figure 5, the factor loading of measured items is greater than 0.8. However, the fitting degree of DPR model as seen in Table 3-7 is not satisfactory.

Before the EFA analysis of TI scale was conducted, KMO and Bartlett tests were run. According to Table 12 in Appendix II, KMO is 0.792, and  $\chi^2$  reaches a significant level ( $P < 0.001$ ), so the data can be considered suitable for EFA analysis.

According to the EFA results in Table 13 of Appendix II, one factor with an eigenvalue greater than 1 is extracted, and the principal factor cumulative variance explained is 86.168 percent (>60 percent). The factor loading of items 1-4 is 0.92, 0.91, 0.95, and 0.93, respectively (>0.9), which shows that the scale has good convergent validity.

The above analysis indicates that the TI model needs to be further modified. The covariation relationships are established between residuals with covariant relations. The results show that the MI between residual e1 (TI1) and e2 (TI2), e4 (TI4) is 112.46 and

14.61. The large MI between these items indicates the differentiation between them is poor; therefore, TI1 is deleted. After the deletion, the factor loading of remaining items is greater than 0.8 (see Figure 6 in Appendix II). According to Table 3-7, the model fitting degree is significantly improved after model modification and various measured index values have met the standards set by the study. Therefore, the TI scale passed the test.

Table 3-7 Evaluation index for TI model fitting degree  
(Data comparison before and after model modification)

Evaluation index	Desired value	Measured value	Fitting degree	Measured value after model modification	Fitting degree after model modification
X <sup>2</sup> /df	<5, <3 (preferably)	X <sup>2</sup> /df=65.108 (X <sup>2</sup> =130.216, df=2)	No Fitting	X <sup>2</sup> /df=0 (X <sup>2</sup> =0.000, df=0)	Very Good
RMR	<0.05	0.052	Good	0.000	Very Good
AGFI	>0.9	0.310	Poor	-	Very Good
GFI	>0.9	0.862	Poor	1.000	Very Good
RMSEA	<0.1, <0.05 (preferably)	0.411	Poor	0.980	Good
NFI	>0.9	0.922	Good	1.000	Very Good
IFI	>0.9	0.923	Good	1.000	Very Good
CFI	>0.9	0.922	Good	1.000	Very Good

The reliability analysis results of the formal TI scale are shown in Table 14 of Appendix II. The table shows that the overall Cronbach's  $\alpha$  of the TI scale is 0.917 > 0.7, indicating that the scale's internal consistency is good and the reliability is high. The CITC of the seven items is more than 0.7. If any of the items were deleted, the Cronbach's  $\alpha$  would be lower than the overall value of the original scale; therefore, all the items should be retained.

### 3.6 Common method variances analysis

In this study, in order to avoid the effect of common method variances on the

results, two questionnaires were conducted on the same respondents over a timespan of three months. The first questionnaire focused on DPR and OC and the second questionnaire on LMX and TI. Meanwhile, we used Harman’s single factor analysis method to carry out common-method bias test. The basic assumption was that if there is common-method bias, the EFA principal component analysis will only extract a single factor, or the variable variation is mainly explained by an extracted common factor. EFA analysis of all measured items shows that the first largest common factor can explain 34.2 percent variable variation, accounting for 43.6 percent (less than 50 percent) of the variation of the total variables, which is acceptable. Therefore, it can be considered that there is no common-method bias that can seriously affect the research results.

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## **Chapter 4: Empirical Analysis and Hypothesis Test**

The collected data were analyzed with descriptive statistical analysis, correlation analysis and variance analysis, and the SEM was used to verify the theoretical model constructed in this study.

### **4.1 Data description**

#### **4.1.1 Sample descriptive statistical analysis**

The sample descriptive statistics are shown in Table 4-1. There were 224 male respondents, accounting for 58.8 percent of the total; 188 respondents were aged 30–39 (49.3 percent of the total) and 103 were aged 40–49 (27.0 percent); 324 are married, accounting for 85.0 percent of respondents; most respondents hold a bachelor or master’s degree, and the number is 178 respectively, with each group accounting for 46.7 percent of the total. 334 clinicians made up 87.7 percent of respondents; 144 respondents (37.8 percent) held intermediate titles and 106 (27.8 percent) held vice senior titles; there are 293 general professional technicians, accounting for 76.9 percent of respondents. 150 respondents (39.4 percent of the total) came from departments of internal medicine and 169 (44.4 percent) came from departments of surgery. The number of respondents who have worked in the medical field for fewer than five years and for 6–15 years was 150 (27.3 percent) and 169 (36.2 percent), respectively. Similarly, most respondents had worked in the surveyed hospital either for fewer than five years (123, 32.3 percent) or for 6–15 years (147, 38.6 percent).

Table 4-1 Sample descriptive statistical analysis

	Classification	No.of respondents	Percentage (%)	Cumulative percentage (%)
Gender	Male	224	58.8	58.8
	Female	157	41.2	100.0
Age	29 or below	43	11.3	11.3
	30-39	188	49.3	60.6
	40-49	103	27.0	87.7
	50 or above	47	12.3	100.0
Marital status	Unmarried	55	14.4	14.4
	Married	324	85.0	99.5
	Others(divorce)	2	.5	100.0
Education background	College or below	5	1.3	1.3
	Bachelor	178	46.7	48.0
	Master	178	46.7	94.8
	Doctor	20	5.2	100.0
Doctor type	Clinician	334	87.7	87.7
	Doctors in supporting department	47	12.3	100.0
Professional title	Primary	86	22.6	22.6
	Intermediate	144	37.8	60.4
	Vice senior	106	27.8	88.2
	Senior	44	11.5	99.7
	Ungraded	1	.3	100.0
Post	Middle-level managers or above	88	23.1	23.1
	General professional technician	293	76.9	100.0
	Department of internal medicine (including emergency care)	150	39.4	39.4
	Department of surgery	169	44.4	83.7
Department classification	Department of medical technology	47	12.3	96.1
	Other medical systems (e.g. community health centers)	15	3.9	100.0
	Five years or below	104	27.3	27.3
Length of service	6-15 years	138	36.2	63.5
	16-25 years	94	24.7	88.2
	25 years or above	45	11.8	100.0
Working years in the surveyed hospital	Less than 5 years	123	32.3	32.3
	6-15 years	147	38.6	38.6
	16-25 years	81	21.3	21.3
	25 years or above	30	7.9	7.9

N=381

### 4.1.2 Descriptive analysis of measured variables

Sample normal distribution can be tested by testing the skewness and kurtosis of a single variable. The samples are considered to conform to the normal distribution when the absolute value of skewness is less than 3 and the absolute value of kurtosis is less than 10 (Pei, 2014). The statistical results of the extreme values, skewness, and kurtosis of the measured variables in the questionnaire are shown in Table 15 of Appendix II. According to the table, the absolute value of skewness is 0.470–1.922 (less than 3) and the kurtosis is 0.019–5.608 (less than 10), indicating that the samples are in accordance with the normal distribution.

## 4.2 Correlation analysis

As can be seen from Table 4-2, LMX Mean±Std is 4.79±0.86; DPR Mean±Std is 5.23±0.54; OC Mean±Std is 5.01±0.85; TI Mean±Std is 1.67±0.81. On the condition that  $P < 0.01$ , there is a significant positive correlation between LMX and DPR and OC (correlation coefficients are 0.22 and 0.26, respectively); there is a significant negative correlation between LMX and TI (the correlation coefficient is -0.34); there is a significant positive correlation between DPR and OC (the correlation coefficient is 0.52); and there is a significant negative correlation between DPR and TI as well as between OC and TI (the correlation coefficients are -0.20 and -0.28, respectively). There is no significant correlation between demographic factors such as age, education level, professional title, department classification, length of service, and working years in surveyed hospital and research variables such as LMX, DPR, and OC. There is no significant correlation between all demographic factors and TI.

Table 4-2 Mean of main variables and correlation between variables

Variable	Mean±Standard	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Gender	1.41(0.49)	1												
2.Age	38.27(7.97)	-0.087	1											
3.Marital Status	1.86(0.36)	-.061	.323**	1										
4.Education Background	2.56(0.62)	-.024 *	-.305*	-.052	1									
5.Doctor Type	1.12(0.33)	.156**	.005	-.032	-.198**	1								
6.Professional title	2.29(0.95)	-.004	.788**	.332**	-.095	-.073	1							
7.Post	1.77(0.42)	.041 *	-.561*	-.159**	-.120*	.092	-.644**	1						
8.Department classification	1.81(0.80)	.041	.014	-.001	-.252**	.530**	-.089	.071	1					
9.Length Of service	13.56(9.12)	-.062	.965**	.306**	-.379**	.044	.770**	-.551**	.057	1				
10.Working years in surveyed hospital	12.00(8.59)	.000	.854**	.283**	-.402**	.055	.753**	-.534**	.016	.882**	1			
11.LMX	4.79(0.86)	-.126*	.012	.030	-.004	-.173**	.006	-.077	-.071	.012	.015	1		
12.DPR	5.23(0.54)	-.037	.016	.123*	-.016	-.105*	.057	-.055	.031	.024	.047	.224**	1	
13.OC	5.01(0.85)	-.037	.056	.021	.008	-.001	.079	-.121*	.022	.051	.048	.262**	.521**	1
14.TI	1.67(0.81)	.048	-.019	.013	-.044	.002	-.044	.092	-.009	-.012	.021 *	-.343*	-.202**	-.275*

Note: Pearson. N=381. \*\*.represents two measured variables are significantly correlated (P=0.01, double- sided); \*.represents two measured variables are significantly correlated (P=0.05, double- sided).

### **4.3 Variance analysis of the effect of demographic factors on research variables**

According to the grouping of demographic factors, we used an independent sample T-test (two groups) and one-way ANOVA (more than two groups) to test the influence of each factor on each research variable. In the independent sample T-test, the homogeneity of variance is first tested. If the homogeneity of variance is confirmed ( $P > 0.05$ ), the significance of mean difference is then further tested. In the one-way ANOVA, if the population variance of variable shows significant difference ( $P < 0.05$ ), the homogeneity of the variance is then tested. If the variance homogeneity is confirmed ( $P > 0.05$ ), the LSD pairwise T-test is used to determine whether the mean value shows significant difference. The independent sample T-test is conducted for gender, marriage, education background, doctor type, and post. The other demographic variables are analyzed using one-way ANOVA.

#### **4.3.1 Effect of demographic factors on research variables**

The effects of demographic factors such as gender, marital status, doctor type and post on research variables are analyzed and the results are summarized in Table 4-3. In the case of gender, the significance levels (P value) of homogeneity of variance tests for LMX, DPR, OC, and TI are 0.145, 0.093, 0.073, and 0.085, respectively ( $P > 0.05$  for all), which indicates the assumptions of homogeneity of variance for LMX, DPR, OC, and TI are all supported. Therefore, the effect of gender on research variables can be measured using an independent sample T-test. According to Table 4-3, the LMX mean for male and female doctors is 4.88 and 4.67 (mean difference = 0.22), and the LMX mean significance (P value) is 0.014 ( $< 0.05$ ), indicating male doctors have higher LMX than female doctors. The mean significances (P values) for DPR, OC, and TI are 0.469, 0.466, and 0.351, respectively ( $P > 0.05$  overall), which suggests there is no significant difference regarding the effect of gender on DPR, OC and TI.

In terms of marital status, the significance levels (P values) of homogeneity of variance test for LMX,DPR,OC, and TI are 0.763, 0.947, 0.093, and 0.65, respectively ( $P>0.05$  overall), which indicates the assumptions of homogeneity of variance for LMX, DPR, OC, and TI are all supported. Therefore, the effect of marital status on research variables can be analyzed using an independent sample T-test. According to Table 4-3, the DPR means for unmarried and married doctors are 5.06 and 5.26 (mean difference= $-0.2$ ), and the DPR mean significance (P value) is 0.011( $<0.05$ ); this suggests that married doctors enjoy better DPR than unmarried ones. The mean significances (P values) for LMX, OC, and TI are 0.243, 0.363, and 0.952 ( $P>0.05$  overall), which suggests there is no significant difference regarding the effect of marital status on LMX, OC, and TI.

From perspective of doctor type, the significance levels (P values) of homogeneity of variance test for LMX,DPR,OC, and TI are 0.594, 0.574, 0.048, and 0.067 respectively ( $P>0.05$  for all except OC), which indicates the assumptions of homogeneity of variance for LMX, DPR, and TI are all supported. Therefore, the effect of doctor type on LMX, DPR and TI can be measured using an independent sample T-test. According to Table 4-3, the LMX mean for clinicians and doctors in supporting departments are 4.85 and 4.40 (mean difference= $0.45$ ), and the LMX mean significance (P value) is 0.001( $<0.05$ ), which indicates that clinicians have higher LMX than doctors in supporting departments. The DPR mean for clinicians and doctors in supporting departments is 5.25 and 5.08 (mean difference= $0.17$ ), and the DPR mean significance (P value) is 0.04( $<0.05$ ), which indicates that clinicians enjoy better DPR than doctors in supporting departments. The mean significance (P value) for OC is 0.979 and for TI it is 0.968 ( $P>0.05$  for both), which suggests there is no significant difference regarding the effect of doctor type on OC and TI.

As measured by post, the significance levels (P values) of homogeneity of variance test for LMX,DPR,OC, and TI are 0.54,0.831,0.841, and 0.092,respectively ( $P>0.05$  for all), indicating that the assumptions of homogeneity of variance for LMX, DPR, and TI

are all supported. Therefore, the effect of post on LMX, DPR, and TI can be measured using an independent sample T- test. According to Table 4-3, the OC mean for middle-level managers or above is 5.20 and for general professional technicianit is 4.95 (mean difference=0.24), and the OC mean significance (P value) is 0.017(<0.05); this indicates that middle-level managers or above foster higher OC than general professional technician. The mean significance (P values) for LMX, DPR, and TI are 0.132, 0.284, and 0.073, respectively (P>0.05 overall), which suggests there is no significant difference regarding the effect of post on LMX, DPR, and TI.

Table 4-3 Variance analysis regarding the effect of demographic factors on research variables

Variable	Demographic factors	No. of samples	Mean	Homogeneity of Variance Test		Comparison of mean difference		
				F value	Sig.	Sig.	Mean difference	
LMX	Male	224	4.88	2.128	.145	.014	.22	
	Female	157	4.67					
	Married	55	4.68	.091	.763	.243	-.15	
	Unmarried	324	4.82					
	Clinician	334	4.85					
	Doctors in supporting department	47	4.40					
	Mid-level managers or above	88	4.91	.376	.540	.132	.16	
	General professional technician	293	4.76					
	Male	224	5.25					
	DPR	Female	157	5.21	2.828	.093	.469	.04
Married		55	5.06					
Unmarried		324	5.26	.004	.947	.011	-.20	
Clinician		334	5.25					
Doctors in supporting department		47	5.08					
Mid-level managers or above		88	5.29					
General professional technician		293	5.22	.046	.831	.284	.07	
Male		224	5.03					
Female		157	4.97					
OC		Married	55	4.92	2.833	.093	.363	-.11
	Unmarried	324	5.03					
	Clinician	334	5.01					
	Doctors in supporting department	47	5.01					
	Mid-level managers or above	88	5.20	.040	.841	.017	.24	
	General professional technician	293	4.95					
	Male	224	1.64					
	TI	Female	157	1.72	2.990	.085	.351	-.08
		Married	55	1.66				
		Unmarried	324	1.67	.206	.650	.952	-.007
Clinician		334	1.67					
Doctors in supporting department		47	1.67					
Mid-level managers or above		88	1.53					
General professional technician		293	1.71	2.856	.092	.073	-.18	
Male		224	1.64					
Female		157	1.72					

Note: There are only two samples whose marital status is abnormal (such as divorced),so these have not included in this study. The sig level of homogeneity of variance test and mean difference test is 0.05.

### 4.3.2 Effects of different department classification on research variables

The samples in this study come from four kinds of medical departments. Considering there are only 15 samples (less than 30) from other medical systems (for example, community health centers), they are classified into the department of medical technology. From Table 4-4, which shows the variance analysis concerning the effect of department classification on research variables, it can be seen that when the confidence level is below 95 percent, there is no significant difference regarding the effect of department classification on OC and TI. However, there is a significant difference in relation to the effect of department classification on LMX and DPR. Therefore, the effect of department classification on research variables is conducted based on the LSD method.

Table 4-4 Variance analysis concerning the effect of department classification on research variables

Variable		Sum of squares	df	Mean square	Mean difference test		Homogeneity of variance test
					F value	Sig.	Homogeneous or not?
LMX	Inter-group	18.156	2	9.078	13.158	.000	Yes
	Intra-group	260.795	378	.690			
	Total	278.951	380				
DPR	Inter-group	2.461	2	1.230	4.311	.014	Yes
	Intra-group	107.877	378	.285			
	Total	110.338	380				
OC	Inter-group	2.343	2	1.172	1.618	.200	Yes
	Intra-group	273.758	378	.724			
	Total	276.101	380				
TI	Inter-group	3.114	2	1.557	2.404	.092	Yes
	Intra-group	244.772	378	.648			
	Total	247.886	380				

Table 4-5 shows the pairwise comparison results between different medical departments using LSD method. The LMX mean among doctors in department of surgery, department of internal medicine and department of medical technology is  $5.00 \pm 0.84$ ,  $4.72 \pm 0.83$  and  $4.40 \pm 0.80$  (Mean $\pm$ Std); the LMX mean difference between department of surgery and department of internal medicine, department of medical technology is 0.28 and 0.61 ( $P=0.003$  and  $0.001 < 0.05$ ); the LMX mean difference between departments of internal medicine and departments of medical technology is  $0.33$  ( $P=0.008 < 0.05$ ), which indicates there is significant LMX difference between doctors in any two of these medical departments. Compared with doctors in departments of internal medicine, doctors in surgical departments enjoy high LMX, while doctors in departments of medical technology have low LMX.

Table 4-5 also shows the DPR mean difference between departments of surgery and departments of internal medicine is  $-0.16$  and between departments of surgery and departments of medical technology is  $-0.18$  ( $P=0.01$  and  $0.028 < 0.05$ , respectively), which indicates there is a significant DPR difference between doctors in departments of internal medicine ( $5.17 \pm 0.53$ ), departments of surgery department ( $5.33 \pm 0.54$ ), and departments of medical technology ( $5.15 \pm 0.52$ ). Relative to doctors in department of surgery, doctors in department of internal medicine and department of medical technology have low DPR.

Table 4-5 Pairwise comparison results of LMX and DPR between doctors in different medical departments using LSD method

Variable	Analysis method	Department classification (I)	Department classification (J)	Mean difference (I-J)	Sig.
LMX	LSD	Department of surgery	Department of internal medicine	.28	.003
			Department of medical technology	.61	.000
			Department of internal medicine	.33	.008
DPR	LSD	Department of internal medicine	Department of surgery	-.16	.010
			Department of medical technology	-.18	.028

### 4.3.3 Effect of other demographic factors on research variables

According to the independent sample T-test and one-way ANOVA, there is no significant difference in population variance between doctors regarding the effect of age, education background, professional title, length of service, and working years in surveyed hospital on LMX, DPR, OC, and TI ( $P > 0.05$ ).

### 4.3.4 Summary of significant difference regarding effect of demographic factors on research variables

According to the above analysis and Table 4-6, there is a significant difference regarding effect of gender on LMX, marital status on DPR, doctor type on LMX and DPR, post on OC, as well as department classification on LMX and DPR. However, the effects of other demographic factors such as age, education background, professional title, length of service, and working years in the surveyed hospital on research variables are statistically insignificant. There is no significant difference regarding the effect of

all demographic factors on TI.

Table 4-6 Summary of significant variance analysis regarding effect of demographic factors on research variables

Variable	Gender	Marital status	Doctor type	Post	Department classification	Education age background	Professional title	Length of service	Working years in surveyed hospital
LMX	Yes		Yes		Yes				
DPR		Yes	Yes		Yes				
OC				Yes					
TI									

#### 4.4 SEM test and analysis of LMX-DPR-OC and TI

In this study, the partial mediating effect model (M1) and full mediating effect model (M2) are analyzed and compared. The optimal model is selected according to the fitting degree of mediating model. According to the M1 model, LMX affects OC, with DPR playing a moderating role between them. Based on M1, M2 deleted the direct impact path of LMX on OC. The fitting process of M1 and M2 are shown below.

##### 4.4.1 Partial mediating effect M1

According to Table 4-7,  $X^2/df < 3$ , AGFI, GFI, NFI, IFI, CFI > 0.9, RMSEA is close to 0.05. The analysis results show that M1 has a good degree of fit.

Table 4-8 shows the analysis result of AMOS. According to that table and Figure 4-1, the standardized path coefficient of LMX → DPR is 0.31 ( $P < 0.001$ ), indicating LMX has significant and positive impact on DPR; the standardized path coefficient of DPR → OC is 0.69 ( $P < 0.001$ ), suggesting LMX has a significant and positive impact on DPR; the standardized path coefficient of LMX → OC is 0.07 ( $P > 0.05$ ), suggesting LMX has no direct significant on OC.

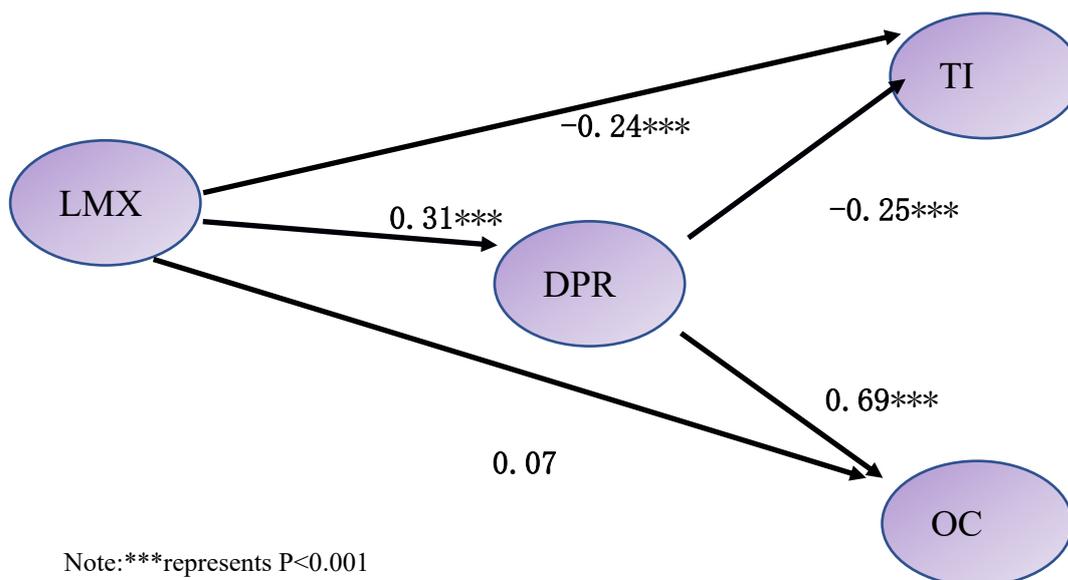


Figure 4-1 Partial mediating model M1

Table 4-7 Model fitting assessment-model M1

Evaluation index	Desired index value	Measured index value	Fitting degree
X <sup>2</sup> /df	<5,<3 (preferably)	X <sup>2</sup> /df=2.030 (X <sup>2</sup> =257.825,df=127)	Very good
RMR	<0.05	0.035	Very good
AGFI	>0.9	0.912	good
GFI	>0.9	0.935	good
RMSEA	<0.1,<0.05 (preferably)	0.052	good
NFI	>0.9	0.947	good
IFI	>0.9	0.972	Very good
CFI	>0.9	0.972	Very good

Table 4-8 shows ,when P<0.001, the standardized path coefficient of DPR->TI is -0.25,which shows that DPR is significantly and negatively correlated with TI;the standardized path coefficient of LMX->TI is -0.24,showing that LMX has a direct significant and negative effect on TI, with DPR playing partial mediating role between them.

Table 4-8 Path coefficient estimation-model M1

Path		Estimation of non- standardized path coefficient	Index		
From	To		C.R.	P	Standard- dized path coefficient
LMX	DPR	.163	4.204	***	.31
DPR	OC	1.300	6.692	***	.69
DPR	TI	-.452	-3.577	***	-.25
LMX	TI	-.230	-4.209	***	-.24
LMX	OC	.065	1.119	.263	.07

Note:\*\*\*represents P<0.001

#### 4.4.2 Completely mediating effect M2

According to Table 4-9,  $X^2/df < 3$ , AGFI, GFI, NFI, IFI, CFI > 0.9, RMSEA is close to 0.05. The analysis results show M2 has a good degree of fit. By comparing the fitting degree of M1 and M2 shown in Table 4-10, the  $X^2/df$  of M2 and M1 are 2.023 and 2.030, respectively, which shows M2 performs better in fitting degree than M1.

According to Table 4-11 and Figure 4-2, the correlation between all variables show statistical significance on the condition that  $P < 0.001$ . LMX is significantly and positively correlated with DPR and the standardized path coefficient is 0.35. DPR is significantly and positively correlated with OC and significantly and negatively correlated with TI; the standardized path coefficients are 0.73 and -0.25, respectively. LMX significantly and negatively correlates to TI; the standardized path coefficient is -0.23. A comparison of M1 and M2 found M2 is the most ideal model (see Table 4-10 and Table 4-11). Therefore, it can be concluded that DPR plays a full mediating role between LMX and OC and plays a partial mediating role between LMX and TI.

According to the M2 path coefficient shown in Table 4-11, LMX is positively correlated with DPR and therefore H1 is supported. LMX is negatively correlated with TI; therefore, H3 is supported; DPR is positively correlated with OC, so H4 is supported;

DPR is negatively correlated with TI, so H5 is supported.

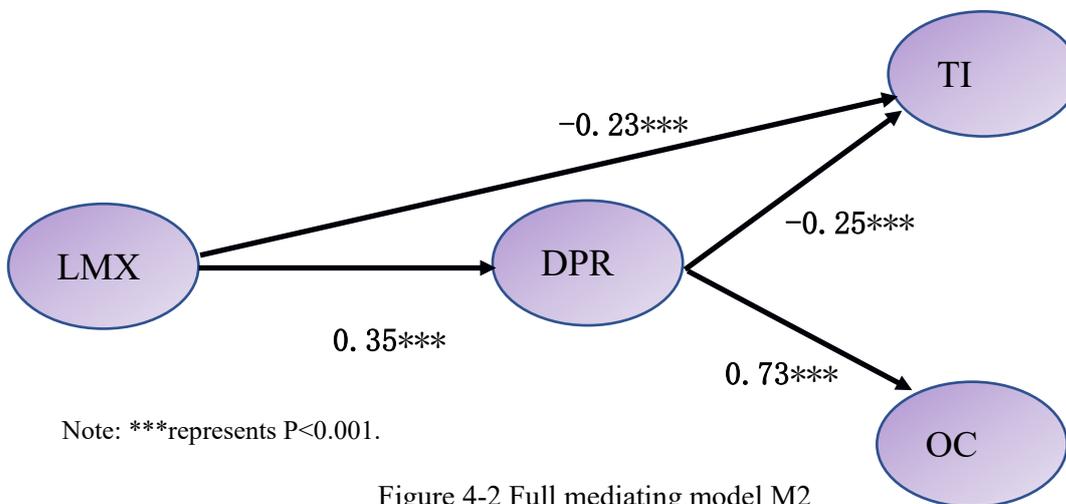


Figure 4-2 Full mediating model M2

Table 4-9 Model fitting assessment-model M2

Assessment index	Desired index value	Measured index value	Fitting degree
		$X^2/df=2.023$	
$X^2/df$	<5, <3 (preferably)	( $X^2=257.308, df=1$ 27)	Very good
RMR	<0.05	0.036	Very good
AGFI	>0.9	0.912	Good
GFI	>0.9	0.934	Good
RMSEA	<0.1, <0.05 (preferably)	0.052	Good
NFI	>0.9	0.947	Good
IFI	>0.9	0.972	Very good
CFI	>0.9	0.972	Very good

The mediating effect of DPR in the relationship between LMX and OC is reported in Tables 4-12. The indirect effect of LMX on OC was influenced by DPR ( $\beta= 0.25$ ), therefore H2 hypothesis is supported. LMX predicted DPR significantly ( $\beta= 0.35$ ) which, in turn, predicted OC significantly ( $\beta= 0.73$ ), therefore confirming H6.

Similarly, the mediating effect of DPR in the relationship between LMX and TI is also illustrated in Table 4-12. LMX has significant direct effect on TI

( $\beta = -0.229$ ) whereas the indirect effect of LMX on TI was mediated by DPR ( $\beta = -0.088$ ). This suggests that LMX have both direct and indirect effect on TI (overall  $\beta = -0.317$ ) and DPR plays a partial mediating role between LMX and TI, therefore H7 hypothesis is supported.

Table 4-10 Comparison of fitting degree of M1 and M2

Evaluation index	M1	M2
X <sup>2</sup> /df	X <sup>2</sup> /df=2.030 (X <sup>2</sup> =257.825,df=127)	X <sup>2</sup> /df=2.023 (X <sup>2</sup> =257.308,df=127)
RMR	0.035	0.036
AGFI	0.912	0.912
GFI	0.935	0.934
RMSEA	0.052	0.052
NFI	0.947	0.947
IFI	0.972	0.972
CFI	0.972	0.972

Table 4-11 Comparison of path coefficients between M1 and M2

Hypothesis	M1				M2				
	Impact path	P	Standardized path coefficient	Hypothesis supported or not?	Hypothesis	Impact path	P	Standardized path coefficient	Hypothesis supported or not?
H1	LMX->DPR	***	.31	Yes	H1	LMX->DPR	***	.35	Yes
H3	LMX->TI	***	-.24	Yes	H3	LMX->TI	****	-.23	Yes
H4	DPR->OC	***	.69	Yes	H4	DPR->OC	***	.73	Yes
H5	DPR->TI	***	-.25	Yes	H5	DPR->TI	***	-.25	Yes
H2	LMX->OC	.335	.07	No					

Note: \*\*\*represents P<0.001.

Table 4-12 Standardized effect of SEM

SEM path		Direct effect	Indirect effect	Overall effect
LMX→	DPR	0.347**	-	0.347**
LMX→	OC	-	0.252**	0.252**
	TI	-0.229**	-0.088**	-0.317**
DPR→	OC	0.727**	-	0.727**
	TI	-0.252**	-	-0.252**

Note: \*\*represents P<0.01

#### 4.5 Summary of research hypotheses

The study verified seven research hypotheses based on EFA, CFA, and SEM analyses and reached the following conclusions. The seven hypotheses are all supported, as shown in Table 4-13.

Table 4-13 Summary of validation results of research hypotheses

No.	Research hypothesis	Result
H1	LMX is positively correlated with DPR	Supported
H2	LMX is positively correlated with OC	Supported
H3	LMX is negatively correlated with TI	Supported
H4	DPR is positively correlated with OC	Supported
H5	DPR is negatively correlated with TI	Supported
H6	DPR plays a mediating role between LMX and OC	Supported
H7	DPR plays a mediating role between LMX and TI	Supported

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## **Chapter 5: Research Results Analysis and Discussions**

This chapter analyzes the results of empirical research and compares them with previous studies. Based on COR and social exchange theory, the research results are discussed.

### **5.1 Current situation of doctors' LMX, DPR, OC, and TI**

According to the descriptive statistical analysis, the mean of the doctors' LMX is 4.79, which is close to a good level. The mean of DPR and OC is 5.23 and 5.01, respectively, which are good. The mean of doctors' TI is 1.67, indicating that the doctors have low TI.

According to the data analysis, the sampled doctors in surveyed hospital enjoy the healthiest DPR, which contradicts the conclusion concerning doctor-based DPR drawn by Chinese scholars (Chen et al., 2015; Wang et al., 2016; Wen et al., 2015), but is consistent with the research conclusion by (Fang, 2016; Miao, 2015; Wang, 2015), who found that medical behavioral norms, service level, service attitude, and quality of medical equipments have impact on DPR. The interviews with heads of related departments in surveyed hospital offer the possible reasons behind the healthy DPR. First, the sampled doctors are all from the third-level Grade A hospitals with a high average level of medical skills. Secondly, in recent years, the surveyed hospital has attached high importance to DPR management and taken multiple measures to improve DPR, such as medical dispute risk assessment management for special patients and a one-stop alarm system to prevent violent incidents. No violent incidents such as killing doctors have been reported in the past 10 years. Wang and Wu (2014) and Wang and Wang (2015) argued that violent attacks against doctors have had adverse effects on DPR. In addition, the relatively complete medical equipment and standardized medical

behaviors in the surveyed hospital contribute to the high satisfaction of patients and medical staff. A third-party evaluation by local health administrative department in 2016 shows the satisfaction levels of outpatient patients, hospitalized patients, and medical staff is 97.3 percent, 99.8 percent, and 99.8 percent, respectively. The satisfaction of patients and doctors is positively and significantly correlated with the DPR. Therefore, the sampled doctors in surveyed hospital enjoy a healthy DPR.

From the perspective of marital status, married doctors enjoy a healthier DPR than unmarried ones, which is consistent with Xiong (2014). A possible reason for this is that, compared to unmarried doctors, the married doctors take more social roles and a strong sense of responsibility (Zhu, 2013), therefore they have paid more attention to effective communication with patients, treatment quality, and safety. In terms of doctor type, clinicians enjoy a healthier DPR, which agrees with the research conclusion of (Chen, 2016). The likely reason for this is that, due to the direct contact and communication with patients, clinicians can show their medical skills before patients and thus easily get a positive response and trust from patients if the treatment result is satisfactory. By contrast, doctors in the supporting department only play a supplementary role and therefore have little chance to face patients. The more that patients trust clinicians, the better the doctor–patient communication will be (Baker et al., 2003). Therefore, clinicians' DPR is better than that of supporting doctors. As measured by medical departments, surgeons generally enjoy healthier DPR than their counterparts in departments of internal medicine and departments of medical technology, possibly because the surgical operation has a more immediate and obvious treatment outcome than therapy of internal medicine, which means that surgeons are easier to get a positive response from patients and develop a sense of professional achievement (Wang & Zhang, 2008). Meanwhile, surgeons have higher job satisfaction than doctors in departments of internal medicine and departments of medical technology (Li, Zhang, Zhou, Zhang, & Liu, 2015).

The LMX mean of sampled doctors in this study is satisfactory, indicating there is

a high-quality exchange relationship between doctors and leaders, which is in agreement with Wang's (2016) conclusion. In terms of gender, the LMX of male doctors is higher than that of female doctors, which is consistent with Lu (2014). A possible reason for this is that male doctors are less entangled by family affairs than female doctors. Particularly with the full implementation of the universal second-child policy in China, female doctors are more likely to be burdened with the tasks of having and taking care of more children. In this context, male doctors are given more opportunities and resources by leaders so that they can assume more responsibilities, which leads to the higher LMX of male doctors. In terms of doctor type, the LMX of clinicians is higher than that of doctors in supporting departments, possibly because clinicians are the main contributors of hospital revenues and therefore enjoy higher status, more care, support, and resources from leaders than supporting doctors. It is also possible that clinicians pay more attention to team cooperation than those clinicians in auxiliary departments. With good team cooperation, clinicians often receive more resources and LMX is higher. Zhang et al. (2012) claimed that work resources are significantly and positively correlated with LMX. From the perspective of department classification, surgeons enjoy higher LMX than internists and medical technicians, among which medical technicians have the lowest LMX. Meanwhile surgeons have a higher level of job satisfaction than their peers in departments of internal medicine (Li et al., 2015) and can obtain more work resources and foster high POS. POS significantly and positively correlates to LMX (Liang et al., 2008). Because of low status in hospital, medical technicians have less access to sufficient work resources and therefore have low POS and LMX.

The sampled doctors in this study have a good level of OC, which is consistent with the research conclusions of other scholars (Tang et al., 2008). Mid-level managers and above have higher OC because they have high POS and value identification (Yi, 2013). According to social exchange theory, high POS results in increased work engagement and high OC. There is no correlation between doctors' OC and the

demographic factors such as gender, marital status, doctor type, classification of departments, age, education level, professional titles, length of service, and working years in the surveyed hospital, which is consistent with the conclusion of Irving et al. (1997); Lee et al. (2000), and Liu et al. (2011) regarding the relationship between gender, marital status, age, length of service, education level, and OC.

Doctors in the surveyed hospital have low TI, which contradicts the research conclusions of most Chinese scholars regarding TI (Chang et al., 2016; Li et al., 2010; Liu, 2016). Meanwhile, the research conclusion that there is no correlation between doctors' TI and the demographic factors such as gender, marital status, doctor type, classification of departments, age, education level, professional titles, length of service, and working years in the surveyed hospital, is also inconsistent with other researchers' research results (Cotton & Tuttle, 1986; Mobley, 1982). According to interviews with the leaders of human resources in the surveyed hospital, the sampled hospital has carried out performance reform from 2015 and implemented the principle of distribution according to more pay for more work. Therefore, the income and welfare of doctors in surveyed hospital is four times higher than that of local urban workers and the turnover rate in recent three years has been hovering at only 2 percent, far lower than that in other third-level grade A hospitals (10 percent). Dong and Proochista (2012) argued low salary and lack of work motivation lead to poor medical service quality and tense DPR and pay fairness is a negative predictor of TI (Yu et al., 2016). With high satisfaction with salary, sufficient work motivation and high job satisfaction, the doctors in surveyed hospital enjoy healthier DPR and low TI.

## **5.2 Analysis and discussion based on doctor-specific Chinese DPR scale**

Although DPR measurement has been heavily conducted by China's scholars, yet considering the vast differences of culture and medical system between China and foreign countries, the foreign DPR scales cannot be directly applied in China.

According to China’s actual conditions and based on literature review and expert interviews, the study developed the doctor-based DPR scale that suits China’s conditions. Among large-scale experimental survey among large samples across China, the DPR scale shows good reliability and validity and is proved to be universally applicable in China, which has laid solid foundation for further DPR research based on the DPR scale.

The DPR scale consists of two dimensions including “doctor–patient trust” and “patient-centered treatment”, whose dimensions are similar to those of DPR scale developed by Eveleigh and Ridd (Eveleigh et al., 2012; Ridd et al., 2009). The dimension “doctor–patient trust” includes the items such as “Patients trust that you will put their treatment needs first”, “Patients have confidence in your treatment plan” and “Patients are willing to follow your treatment plan”, which covers all core elements related to doctor–patient trust. The dimension “patient-centered treatment” includes the items such as “help patients and their families whole heartedly”, “provide patients with the best treatment plan” and “happy to receive patient's return visit”, which comprehensively reflect the doctors’ medical motivation (sense of pride and mission), work attitude and key medical behaviors such as doctor–patient communication and treatment plan in process of treatment.

## **5.3 Discussions of hypotheses test results**

### **5.3.1 Discussion of result of hypothesized relationship between LMX and DPR**

The hypothesis H1 is supported by the empirical study, that is, LMX is positively correlated with DPR. According to social exchange theory, doctors with high-quality LMX can gain more work resources, opportunities, trust. The good doctor–patient communication skills and treatment level can increase mutual trust between doctors and patients, thus improving doctors’ job satisfaction (Zeng, 2012a) and compensating for the doctors’ consumed resources caused by strained DPR. The more psychological

safety and support doctors have, the better the DPR. The organizational support plays a critical role in improving DPR. Aside from counting on social environment to harmonize DPR, the hospital can take direct and controllable measures to effectively manage DPR

### **5.3.2 Discussions of result of hypothesized relationship between LMX and OC**

The hypothesis H2 is supported, namely, LMX is positively correlated with OC. The better the LMX quality, the more resources doctors can acquire from leaders. According to social exchange theory, doctors with rich resources will work harder and enjoy high job satisfaction. According to Tang et al.(2008) job satisfaction of Chinese doctors is positively correlated with OC. Therefore doctors with high LMX foster high OC, whichfills the blank of research on correlation between LMX and OC in China. Since the organizational factors have significant impact on doctors' work attitude, hospital managers should make more efforts to strengthen management from organizational perspective.

### **5.3.3 Discussions of result of hypothesized relationship between LMX and TI**

The hypothesis H3 is supported, namely, LMX is negatively correlated with TI, which is consistent with the research results of Gerstner and Day (1997) and Chinese scholar Zeng (2012b). According to COR and social exchange theory, doctors with high-quality LMX can obtain sufficient work resources and psychological resources to deal with difficulties encountered in work(Huang et al., 2010), thus improving job satisfaction and increasing work engagement and reducing TI. Since the organizational factors have significant impact on doctors' work attitude, hospital managers should make more efforts to strengthen management from organizational perspective.

#### **5.3.4 Discussions of result of hypothesized relationship between DPR and OC**

The hypothesis H4 is supported, namely, DPR is positively correlated with OC. According to social exchange theory, the better the doctors' perceived DPR is, the higher their job satisfaction and the more abundant their social resources. The social resources are important resources acquired by doctors through different kinds of exchange relationships in work, which is positively related to doctors' OC (Huang & Yin, 2014). Therefore, better DPR leads to higher OC, which is consistent with the research results of (Lin, 2013;Qin et al., 2015).

#### **5.3.5 Discussions of result of hypothesized relationship between DPR and TI**

The hypothesis H5 is supported, namely, DPR is negatively correlated with TI, which is consistent with the research results of (Dong et al., 2013;Mo et al., 2015). According to social exchange theory, the better the doctors' DPR is, the more social resources they have and the higher their job satisfaction, the more psychological resources they have, and thus the lower their TI. According to COR, healthier DPR can help doctors reduce psychological input and consumption and increase work engagement (Chu, 2013), thus reducing TI.

#### **5.3.6 Full mediating effect of DPR between LMX and OC**

The study found the direct effect of LMX on OC is 0 after LMX is added to the impact path of LMX->OC, indicating that DPR plays a full mediating role between LMX and OC.

Good DPR not only forms the basis of the improvements of diseases for patients, but also guarantees doctors to realize their occupational value in saving lives. So it can be regarded as a kind of psychological resource for self-realization in doctor's career development. According to the social exchange theory, doctor in higher-quality LMX will step into the loop more easily to obtain better resources, engage more in work with higher level of job satisfaction and thus developing better DPR that in turn indicates

getting more resources in their jobs for doctors. According to the reciprocal principle of social exchange theory, doctors have higher OC. One possible reason for DPR's full intermediate role in the relationship between LMX and OC is that LMX is a kind of organizational resource while DPR is a kind of mental resource for self-realization that is involved in doctor's career development. From the perspective of the social exchange theory, LMX, as a kind of organizational resource, can directly influence DPR and then job-related DPR will directly affect OC. OC refers to a person's emotion of positive identification and his/her willingness to assume an obligation. LMX is an organizational resource, which cannot directly affect the personal professional emotion and identification, but affects the individual's OC through influencing the psychological resource of professional accomplishment such as DPR, thus, DPR has a full effect on LMX's impact on OC. It implies the quality of DPR has a direct impact on the doctor's OC and plays a very important role in improving the professional attractiveness and level. Currently when the medical profession is not attractive and the doctor turnover rate is high (Jie et al., 2013), the government, hospital and society should pay high attention to DPR and make every attempt to improve DPR from organizational perspective, such as improving LMX.

### **5.3.7 Partial mediating effect of DPR between LMX and TI**

The research found DPR plays a mediating role between LMX and TI. The mediating effect is -0.088, accounting for 27.76 percent of overall effect. This shows DPR has a partial mediating effect between LMX and TI. Therefore, LMX can not only directly influence TI but indirectly affect TI through DPR. According to COR and social exchange theory, doctors with high-quality LMX can obtain more resources, improve DPR through their own efforts, increase work engagement and job satisfaction, thus reducing TI. Therefore, DPR plays a crucial role in affecting doctors' TI.

According to the study, the standardized path coefficient of DPR->OC and DPR->TI is 0.73 and -0.25 respectively, signifying DPR affects OC more than TI. This

further shows DPR is mostly affected by the whole social environment and no matter what hospital a doctor chooses to work for, there is no significant change of DPR condition (Xu et al., 2014). Therefore, DPR has little impact on TI. When the DPR condition is similar in the whole medical industry, DPR has big impact on the career development of doctors and further on their OC.

The study found DPR plays a full mediating role between LMX and OC and a partial mediating role between LMX and TI, which shows DPR is an important antecedent variable of OC. The reasonability of turnover and possibility of leaving are two deciding factors of employee turnover. The former is closely associated with employee's promotion opportunities and job satisfaction. According to social exchange theory, the reasonability of turnover is largely decided by whether employees can acquire sufficient resources in an organization. DPR plays partial mediating role between LMX and TI, possibly because LMX is regarded as internal resources while DPR is associated with doctors' psychological resources related to external relationships and sense of achievement. LMX as internal organizational resources can directly and indirectly affect TI while DPR can only affect job satisfaction. Therefore, DPR plays a partial effect between LMX and TI.

In order to achieve the goal of Healthy China 2030, Chinese government must attach high importance to DPR and improve the attractiveness of medical profession and increase the number of medical practitioners.

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## **Chapter 6: Research Conclusions and Prospect**

Going through from research difficulties, literature review and proposition of theoretical framework to definition of concepts, questionnaire design, empirical analysis and hypothesis test, the study consists of qualitative thinking based on relevant theories and quantitative analysis based on empirical research. On the basis of COR and social exchange theory, a theoretical model is constructed based on previous scholars' research. The empirical analysis is carried out using SEM with doctors as the research objects. The doctors' perceived DPR and its impact mechanism on OC and TI are deeply discussed and analyzed from organizational perspective. The research conclusions are summarized as follows:

### **6.1 Research findings**

#### **6.1.1 Finding 1**

In strict accordance with the questionnaire development procedure, the study designed doctor-based DPR scale that well suits China's conditions, which gives researchers a new tool to measure DPR from perspective of doctors. The experimental survey based on the doctor-specific DPR scale is conducted among large samples nationwide. The DPR scale consists of two dimensions, namely doctor–patient trust and patient-centered treatment, which not only covers the main contents of foreign DPR scales but comprehensively reflects the actual conditions of China's DPR. Therefore, it has provided a reliable China-specific DPR scale for DPR research.

#### **6.1.2 Finding 2**

The LMX of doctors in surveyed hospital is close to good level; the DPR and OC level are good; TI is low.

According to the correlation analysis shown in Table 4-2, LMX is significantly and positively correlated with DPR, OC and negatively associated with TI; DPR is a significant and positive predictor of OC and negative predictor of TI; OC significantly and negatively correlates to TI. The analysis results also suggest LMX is positively correlated with DPR; DPR has a full mediating effect between LMX and OC and partial mediating effect between LMX and TI. DPR affects OC more than TI. Improving LMX from organizational perspective can improve doctors' DPR and increase their work resources, ultimately improving OC and reducing TI. Moreover, DPR, as a occupation-related psychological resource, can fully mediate LMX influence on doctors' OC.

### **6.1.3 Finding 3**

There is no significant difference regarding the effect of all demographic factors on TI; the difference of the effect of age, education background, professional title, length of service, and working years in the surveyed hospital on research variables is not statistically significant; there is significant difference regarding the effect of gender on LMX, marital status on DPR, doctor type and department classification on LMX and DPR, as well as post on OC.

## **6.2 Theoretical contribution**

(1) The study developed China-specific doctor-based DPR scale consisting of two dimensions including doctor–patient trust and patient-centered treatment, which shows satisfactory validity and reliability after experimental survey among large sample across China. Meanwhile it provides a new tool of measuring DPR from perspective of doctors that is previously absent.

(2) In this study, DPR is studied from perspective of organization. The study first empirically explored the relationship between LMX and doctor-focused DPR and proved LMX has positive effect on DPR, which enriches the studies on antecedent variables of DPR and provides a new way of studying DPR from organizational

perspective for China’s scholars. Meanwhile, it also validates and complements the impact mechanism of organization support on DPR by foreign scholars.

(3) Based on COR and social exchange theory, the study discussed the impact path of DPR->OC and DPR->TI, finding DPR plays a partial mediating role between LMX and TI and a full mediating role between LMX and OC. And the two impact paths are compared and analyzed. Meanwhile the study also enriches the outcome variables of DPR and fills the gap of research regarding the impact mechanism of DPR on doctors’ work and occupational attitudes. The relevant theories related to OC and TI are also enriched.

### **6.3 Managerial implications**

(1) It is helpful for doctors to correctly understand and handle DPR and improve oc level. Through research, it is found that a good DPR includes “doctor–patient trust” and " patient - centered diagnosis and treatment". On the one hand, doctors should be reminded to pay attention to the construction of a good doctor–patient trust relationship in their work, on the other hand, they should always keep in mind the need to carry out patient-centered diagnosis and treatment and improve their awareness of managing DPR. At the same time, it is suggested that doctors can choose doctor–patient communication skills, professional skills and other courses to improve themselves and improve DPR processing ability. And when doctors face the poor DPR, they can seek the support from the hospital organization level to improve the DPR's coping ability and finally improve the OC level.

(2) The research found DPR is positively related to OC and negatively associated with TI, which implies hospital managers should not only pay attention to the effect of DPR on patients but also that of DPR on doctors’ occupational and work attitudes. Hospital managers can take multiple measures to effective intervene DPR thus controlling TI and OC level, for example, improving LMX quality. The hospital should provide more care and support for unmarried doctors, doctors in department of internal

medicine and department of medical technology, properly resolve doctor–patient conflicts and strengthen DPR management, for example, active construction of internet-based medical services in order to improve the patients’ treatment experience and constantly harmonize DPR.

(3) The hospital should improve DPR management from organizational perspective. First, actively provide trainings for middle-level managers on leadership and management skills and guide them to establish high-quality LMX. Leaders should establish effective communication channel with subordinates and listen to doctors’ real ideas through daily routine meetings or unscheduled communication meetings. In response to doctors’ actual needs, leaders should show care for their work and life and promote the work-related and emotional exchanges; second, appoint employees with transformational and ethical leadership as middle managers; select and appoint middle-level leaders according to merits and on grounds of personal ability instead of gender.

(4) The research results help China’s health administrative departments to realize the harm of DPR and therefore formulate effective policies to manage DPR. The empirical study shows DPR produces partial moderating effect between LMX and TI and full moderating effect between LMX and OC. DPR influences OC more than TI. Considering the insufficient number of doctors and high turnover rate in China, Chinese government must take measures to improve the attractiveness of medical profession to increase the number of medical practitioners and ultimately achieve the goal of Healthy China 2030. According to the research results, government and relevant departments must pay high attention to the prevention and management of DPR in order to improve doctors’ occupational level. When resolving medical disputes and dealing with medical violence, government should not passively require hospitals to make concessions and in most cases offer compensation jointly raised by hospital, department and concerned doctor to patients, but realize the negative effect of difficult DPR on doctors’ work attitude and actively take comprehensive measures to establish harmonious DPR. First, health departments in coordination with publicity department and media should actively

create the environment of respecting and honoring doctors and strictly control the negative reports of defaming images of doctors; severely crack down on professional YiNao and violent attacks against doctors in concerted efforts with public security department and judicial department; the Chinese Medical Doctor Association should play its due role in safeguarding doctors' rights and interests when medical violence occurs in order to minimize the doctors' mental and physical injury. Second, the research results provide basis for relevant departments to establish scientific medical talent assessment system. The performance of medical staff should be assessed on grounds of personal ability such as doctor–patient trust level and patient-center treatment ability as well as service quality and workload, rather than on grounds of number of published papers and education background. Thus doctors can focus on improving doctor–patient trust and patient-centric treatment ability, doctor–patient trust and patient-centered treatment thereby harmonizing worsening DPR. Third, government should speed up reform efforts to reduce the number of budgeted posts in public hospitals and accelerate de-administration of public hospitals so that they have more autonomy to recruit employees, especially to appoint leaders according to hospital culture and leader characteristics. Fourth, the empirical research proves the construction of healthy DPR is concerned with the doctor–patient trust and patient-centric treatment ability. Therefore the Ministry of Education, the health departments at various levels, medical universities and hospitals should make concerted efforts to establish competency-oriented education and training system in college education and on-the-job continuing education focusing on improving doctors' communication ability, service awareness and medical skills in a bid to fundamentally improve doctors' ability to deal with DPR and ameliorate worsening DPR, ultimately improving OC and attractiveness of medical profession and reducing TI.

#### **6.4 Research limitations**

(1) All research variables in the self-made DPR questionnaire in this study are self-

evaluated by doctors and some objective outcome variables are absent. The subjective feelings of the respondents can affect the validity of the questionnaire. Meanwhile, because the questionnaire survey is only conducted in the Fourth Affiliated Hospital of Guangxi Medical University and the survey data are collected from a limited sample, whether the research results are universally valid everywhere remains to be tested.

(2) Because this research is only based on cross sectional research, the conclusions are essentially concerned with the correlation between LMX, DPR, OC and TI, and the causal relationship between them still needs to be further studied in the future longitudinal research.

(3) Limited by the sample size, this study failed to study whether doctors in different departments have different perceptions about DPR and its impact path. The perceptions of nurses and other medical staff and patients toward DPR, doctors' occupational and work attitude remain to be further studied.

## **6.5 Research prospect**

(1) Expand the study of DPR's antecedent variables. The study found that LMX has a direct impact on DPR, but whether the organizational support, organizational justice, group citizenship behaviors and department categories have effect on DPR and how need to be further studied. Particularly, the effect of leadership style on DPR is worthwhile to study.

(2) The influence of DPR on doctors' professional attitude and work attitude can be further studied. With rich connotations, DPR represents a process of dynamic change. Therefore it is not enough to study DPR only by questionnaire survey. In the future research, multiple cases and longitudinal studies can be carried out to provide suggestions for further understanding the background and reasons of the research conclusions.

(3) The DPR research is to be carried out in different kinds of hospitals. Chinese doctors are employed in different types of hospitals at various levels including military

hospital, public hospital (primary hospital, secondary hospital and tertiary hospital), private hospital and foreign joint venture hospital. The surveyed hospital in this study is a secondary public hospital. Constrained by budgeted posts and administrative level, the hospital's management level and style is vastly different from private and other kinds of hospitals. Therefore, doctors in different types of hospitals may have different perceptions towards LMX, which can affect DPR, OC and even TI. The future research can be conducted in different types of hospitals in order to comprehensively and accurately reflect the impact mechanism of LMX on DPR, OC and TI, base on which, effective measures to improve DPR, OC and reduce TI can be proposed and taken.

(4) DPR research is to be further conducted from perspective of patients. Patients serve to be the starting point and ending point of DPR. The patients' feeling and perceptions towards DPR is viewed as the barometer of modern hospital service quality and also the goal of Chinese medical reform. Therefore, under the current background of internet plus, patient-focused DPR scale is advised to be developed and relevant DPR research will be further conducted in an effort to provide suggestions for easing nervous DPR.

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## Appendix I: Questionnaire

### Questionnaire on doctors’ feeling towards work in public hospitals in China (1)

Questionnaire No.:

Dear Mr/Mrs,

*Thank you very much for your participation in the questionnaire survey on doctors’ perception towards (DPR) and occupational commitment. The data collected on condition of anonymity will be kept strictly confidential and used only for academic research. Please rest reassured to answer all questions according to your experience and true feelings. There are no standard answers to all the questions in this questionnaire. Please check among the options representing your views. Thank you very much for your support and cooperation!*

#### 1. Doctor-patient relationship

Please tick among the options reflecting your actual feeling towards the doctor-patient relationship

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completely agree
1. Patients trust that you will put their treatment needs first .	1	2	3	4	5	6
2. Patients have confidence in your treatment plan.	1	2	3	4	5	6
3. Patients are willing to follow your treatment plan.	1	2	3	4	5	6
4. Patients trust that the physical examinations you prescribe are necessary.	1	2	3	4	5	6

5. You always tell patients about the risks potentially caused by treatment plan.	1	2	3	4	5	6
6. You always help patients and their families whole heartedly.	1	2	3	4	5	6
7. You always provide patients with the best treatment plan after comparing alternatives.	1	2	3	4	5	6
8. You are proud that your professional skills can help cure patients.	1	2	3	4	5	6
9. You are very happy to receive patients for return visits..	1	2	3	4	5	6

## 2. Occupational commitment

Please tick among the options reflecting your actual feeling towards profession as a doctor

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completely agree
1. Working as a doctor makes me happy.	1	2	3	4	5	6
2. I am proud of working in the medical field.	1	2	3	4	5	6
3. I am glad to be a doctor.	1	2	3	4	5	6
4. I really identify with the profession as a doctor.	1	2	3	4	5	6
5. I am full of enthusiasm for the career as a doctor.	1	2	3	4	5	6
6. The profession as a doctor is very important to my self image.	1	2	3	4	5	6

## 3. Basic information

1. Gender: ①Male ②Female

2. Age: \_\_\_\_ years old
3. Marital status: ① married ② Unmarried ③ Others (e.g. divorce)
4. Education background: ① College or below ② Bachelor ③ Master ④ Doctor
5. Doctor type: ① clinician ② doctors in supporting departments ③ Others  
(e.g. administrative staff)
6. Professional title: ① Primary ② Intermediate ③ Vice senior ④ Senior ⑤ Ungraded
7. Post: ① middle-level manager or above ② General professional technician
8. Your department classification: ① Department of internal medicine (including  
emergency department) ② Department of surgery ③ Department of medical technology  
④ Other medical institution (e.g. community health center)
9. Length of service: \_\_\_\_ years
10. Having worked in this hospital for \_\_\_\_ years

## Questionnaire on doctors’ feeling towards work in public hospitals in China (2)

Questionnaire No.:

Dear Mr/Mrs,

*Thank you very much for your participation in the questionnaire survey on doctors’ perception towards LMX and turnover intention. The data collected on condition of anonymity will be kept strictly confidential and used only for academic research. Please rest reassured to answer all questions according to your experience and true feelings. There are no standard answers to all the questions in this questionnaire. Please check among the options representing your views. Thank you very much for your support and cooperation!*

### 1. Memeber-leader Exchange

Please check among the options reflecting your relationship with your immediate leaders.

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completelya gree
1.I am fully aware whether my leader is satisfied with my work performance.	1	2	3	4	5	6
2. I think my leader knows a lot about my work problems and needs.	1	2	3	4	5	6
3.I think my leader knows much about my potential.	1	2	3	4	5	6
4. No matter how powerful my leader is, he will try his best to help me solve the major problems in my work.	1	2	3	4	5	6
5. No matter how powerful my leader is, he will help me	1	2	3	4	5	6

overcome difficulties in work at expense of his own interests.						
6. I trust my leader very much. Even if he is absent, I will defend the decisions he has made.	1	2	3	4	5	6
7. I have maintained a good relationship with my leadership.	1	2	3	4	5	6

## 2. Turnover intention

Please score the following statements using the scale of 1 to 6 to express your feelings towards TI.

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completely agree
1 I have the idea of leaving the hospital	1	2	3	4	5	6
2.If possible, I want to resign immediately.	1	2	3	4	5	6
3.I am planning to resign in the next six months.	1	2	3	4	5	6
4.I am actively looking for another job.	1	2	3	4	5	6

## 3. Basic information

1. Your position: ①middle-level manager or above ②General professional technician
2. Your department classification: ① Department of internal medicine (including emergency department) ②Department of surgery ③Department of medical technology ④Other medical institutions (e.g. community health center)

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## Appendix II: Figures & Tables

### List of Figure

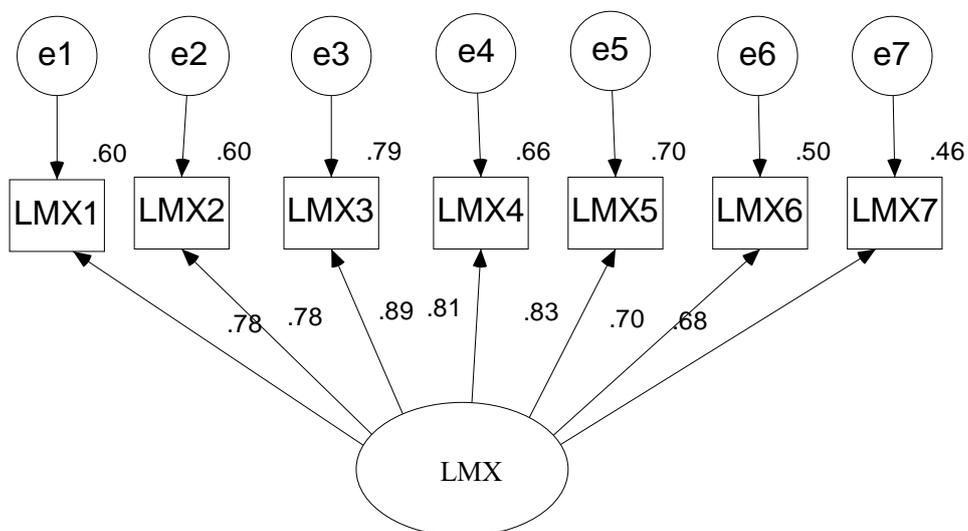


Figure 1 LMX constructs based on CFA analysis

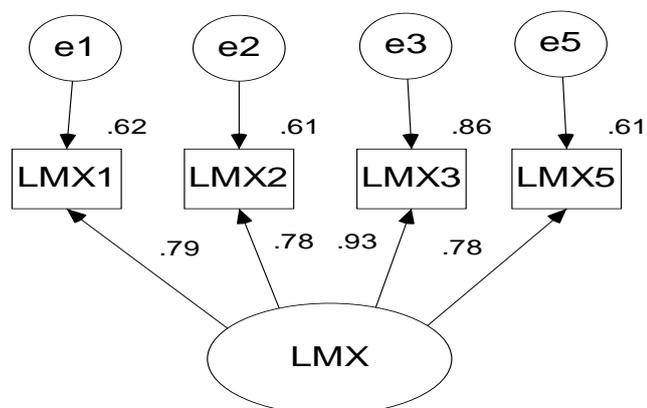


Figure 2 LMX constructs based on CFA analysis after model modification

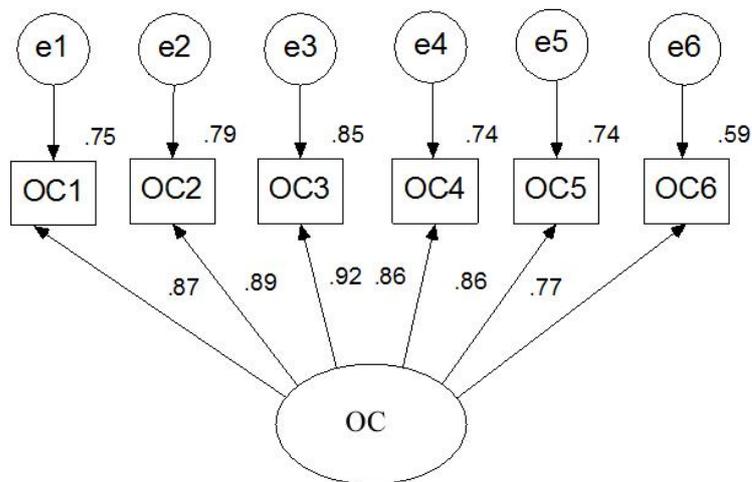


Figure 3 OC constructs based on CFA analysis

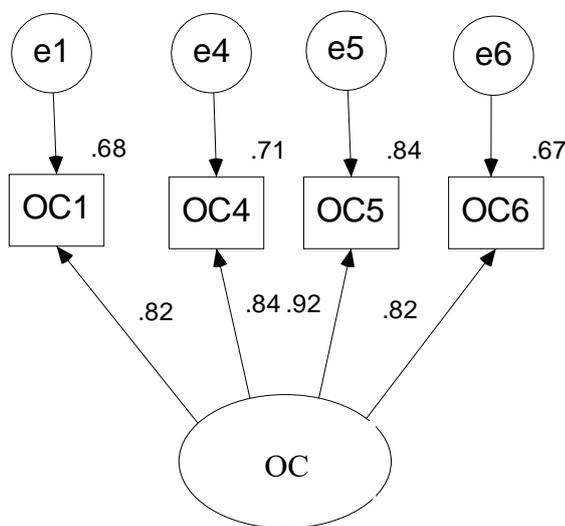


Figure 4 OC constructs based on CFA analysis after model modification

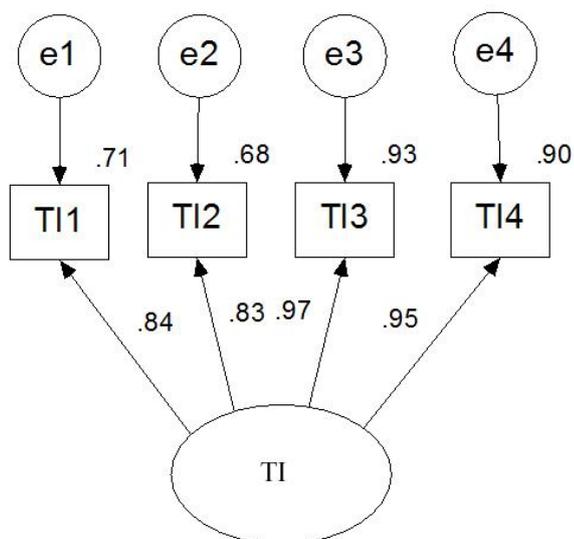


Figure 5 TI constructs based on CFA analysis

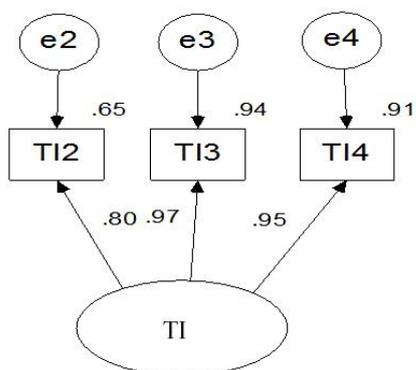


Figure 6 TI constructs based on CFA analysis (after model modification)

## List of table

Table 1 LMX scale

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	ompletelyagree
LMX1. I am fully aware whether my leader is satisfied with my work performance.	1	2	3	4	5	6
LMX 2. I think my leader knows a lot about my work problems and needs.	1	2	3	4	5	6
LMX 3. I think my leader knows much about my potential.	1	2	3	4	5	6
LMX 4. No matter how powerful my leader is, he will try his best to help me solve the major problems in my work.	1	2	3	4	5	6
LMX 5. No matter how powerful my leader is, he will help me overcome difficulties in work at expense of his own interests.	1	2	3	4	5	6
LMX 6. I trust my leader very much. Even if he is absent, I will defend the decisions he has made.	1	2	3	4	5	6
LMX 7. I have maintained a good relationship with my leadership.	1	2	3	4	5	6

Table 2 OC scale

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completely agree
OC1. Working as a doctor makes me happy.	1	2	3	4	5	6
OC2. I am proud of working in the medical field.	1	2	3	4	5	6
OC3. I'm glad to be a doctor.	1	2	3	4	5	6
OC4. I really identify with the profession as a doctor.	1	2	3	4	5	6
OC5. I am full of enthusiasm for the career as a doctor.	1	2	3	4	5	6
OC6. The profession as a doctor is very important to my self image.	1	2	3	4	5	6

Table 3 TI scale

Item	Totally disagree	Disagree	Partially disagree	Partially agree	Agree	Completely agree
TI1. I have the idea of leaving the hospital	1	2	3	4	5	6
TI2. If possible, I want to resign immediately.	1	2	3	4	5	6
TI3. I am planning to resign in the next six months.	1	2	3	4	5	6
TI4. I am actively looking for another job.	1	2	3	4	5	6

Table 4 KMO, Bartlett test based on DPR scale

KMO test based on sufficient samples		.847
Approximate chi-square $\chi^2$		1964.955
Bartlett test	df	36
Sig.		.000

Table 5 Proportion of variance explained based on DPR scale

Component	Initial eigenvalue		Extracted sum of square loading			Rotated sum of square loading		
	Total	Variance %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	4.524	50.271	4.524	50.271	50.271	3.197	35.526	35.526
2	1.781	19.784	1.781	19.784	70.054	3.108	34.528	70.054
3	.707	7.861			77.915			
4	.468	5.195			83.110			
5	.410	4.557			87.667			
6	.389	4.319			91.986			
7	.293	3.258			95.244			
8	.264	2.939			98.183			
9	.164	1.817			100.000			

Extracted method: Principal Component Analysis

Table 6 KMO, Bartlett test based on LMX scale

KMO test based on sufficient samples		.898
Approximate chi-square $\chi^2$		1760.660
Bartlett test	df	21
Sig.		.000

Table 7 Proportion of variance explained based on LMX scale

Component	Initial eigenvalue			Extracted sum of square loading		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	4.679	66.845	66.845	4.679	66.845	66.845
2	.646	9.222	76.067			
3	.538	7.685	83.752			
4	.387	5.528	89.281			
5	.313	4.468	93.749			
6	.237	3.382	97.131			
7	.201	2.869	100.000			

Extracted method: Principal Component Analysis

Table 8 CITC and reliability analysis based on LMX scale

Item	Mean if Item Deleted	Variance If Item Deleted	Cronbach' s $\alpha$	
			If Item Deleted	if Item Deleted
LMX1	14.21	7.210	.727	.868
LMX2	14.35	7.061	.744	.861
LMX3	14.39	6.691	.846	.824
LMX5	14.57	6.446	.723	.874

Table 9 KMO, Bartlett test based on OC scale

KMO test based on sufficient samples		.903
Bartlett test	Approximate chi-square $\chi^2$	2163.792
	df	15
	Sig.	.000

Table 10 Proportion of variance explained based on OC scale

Component	Initial eigenvalue			Extracted sum of square loading		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	4.722	78.695	78.695	4.722	78.695	78.695
2	.452	7.531	86.226			
3	.295	4.920	91.146			
4	.229	3.811	94.957			
5	.174	2.894	97.851			
6	.129	2.149	100.000			

Table 11 CITC and reliability analysis based on OC scale

Item	Mean	Variance	Cronbach' s $\alpha$ (CITC)	Cronbach' s $\alpha$	Cronbach' s $\alpha$
	if Item Deleted	if Item Deleted		if Item Deleted	
OC1	15.18	6.417	.778	.895	.912
OC4	14.96	6.901	.800	.886	
OC5	14.98	6.673	.854	.867	
OC6	14.97	6.936	.774	.894	

Table 12 KMO, Bartlett test based on TI scale

KMO test based on sufficient samples		.792
Bartlett test	Approximate chi-square $\chi^2$	1650.209
	df	3
	Sig.	.000

Table 13 Proportion of variance explained based on DPR scale

Component	Initial eigenvalue			Extracted sum of square loading		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	3.447	86.168	86.168	3.447	86.168	86.168
2	.327	8.182	94.349			
3	.152	3.803	98.152			
4	.074	1.848	100.000			

Table 14 CITC and reliability analysis based on TI scale

Item	Mean	Variance	(CITC)	Cronbach' s $\alpha$	
	if Item Deleted	if Item Deleted		if Item Deleted	Cronbach' s $\alpha$
TI2	3.19	2.294	.787	.906	
TI3	3.41	2.969	.893	.848	.917
TI4	3.41	2.890	.881	.850	

Table 15 Descriptive statistical analysis of measured items

	Min value	Max value	Mean	STD	skewness	Std	kurtosis	Std
DPR1	1	6	4.96	.920	-1.069	.125	1.851	.249
DPR2	1	6	4.95	.849	-.916	.125	1.420	.249
DPR3	1	6	4.82	.878	-.563	.125	.392	.249
DPR6	3	6	5.48	.626	-.917	.125	.430	.249
DPR7	3	6	5.52	.574	-.802	.125	.124	.249
DPR8	3	6	5.47	.659	-.962	.125	.274	.249
DPR9	2	6	5.43	.663	-1.01	.125	1.328	.249
LMX1	1	6	4.96	.937	-1.240	.125	2.095	.249
LMX2	1	6	4.82	.954	-.825	.125	1.050	.249
LMX3	1	6	4.78	.949	-.672	.125	.471	.249
LMX5	1	6	4.61	1.109	-.632	.125	.019	.249
TI2	1	6	1.81	1.043	1.734	.125	3.190	.249
TI3	1	6	1.60	.757	1.770	.125	5.361	.249
TI4	1	6	1.60	.788	1.922	.125	5.608	.249
OC1	1	6	4.85	1.044	-1.174	.125	1.706	.249
OC4	1	6	5.07	.922	-1.012	.125	1.252	.249
OC5	1	6	5.05	.928	-1.139	.125	1.869	.249
OC6	1	6	5.06	.936	-1.181	.125	1.802	.249
DPR Mean	2.86	6.00	5.23	.53885	-.498	.125	.424	.249
LMX Mean	2.00	6.00	4.79	.85679	-.470	.125	.174	.249
OC Mean	1.25	6.00	5.01	.85240	-1.075	.125	1.788	.249
TI Mean	1.00	6.00	1.67	.80767	1.632	.125	3.862	.249